

INSTALLATION, OPERATION & MAINTENANCE

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Fire, Smoke, Ceiling and Control Dampers

An Installation, Operation and
Maintenance Manual for Nailor
Life Safety and Air Control Products.

- Curtain Type Fire Dampers
- Multi-Blade & True Round Fire Dampers
- Smoke Dampers
- Combination Fire/Smoke Dampers
- Ceiling Dampers/Fire Rated Diffusers
- Accessories
- Control and
Backdraft Dampers





IOM Manual Fire, Smoke, Ceiling and Control Dampers

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FDINTSL 2/05 1.020-1.021

Model Series D01X4-XX Dynamic

FDINTSLD 1/14 1.022-1.023

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Model Series 0200 & 0500 Thinline 2" Frame

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FDDOWINST 6/21 1.074-1.075

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Fire Rated Ceiling Diffusers, Ductless Return Grilles and Ceiling Dampers for Suspended Ceiling Asemblies Model Series: 0700, 4000, 4400 & 4100

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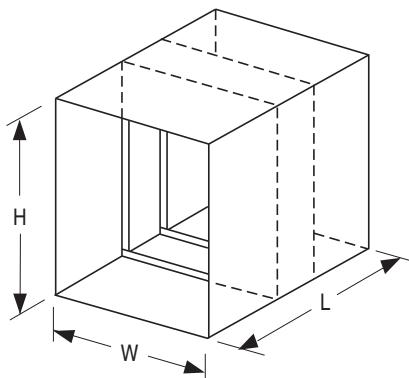
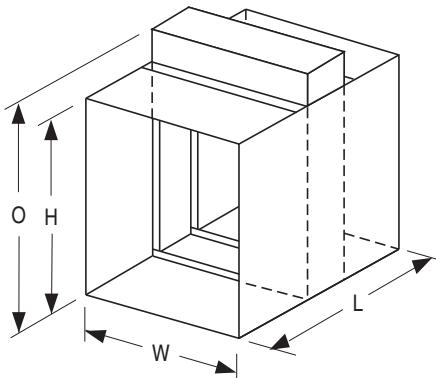
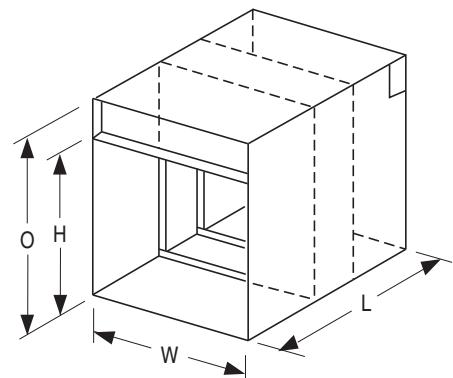


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TYPE 'A'
BLADES AND FRAME IN AIRSTREAM

STYLE 1 (OPTIONAL)

STYLE 2 (STANDARD)
NOTES:
1. Dimensional Data.

W = Nominal duct width

H = Nominal duct height

L = Sleeve length

O = Overall damper height

For 'O' dimension and relationship to duct height, refer to dwgs. FDSC (standard frame) or FDTSC (thinline frame) depending on damper model.

Type CR duct collars are furnished 1/8" (3) undersize for duct dimensions up to 36" dia. (914) and 1/4" (6) undersize on larger sizes.

Type CO and CSR duct collars are furnished 1/8" (3) undersize for duct dimensions up to 36" x 24" (914 x 610) and 1/4" (6) undersize on larger sizes. Collars are 1 1/4" (32) minimum length.

2. Sleeves are available in lengths up to 36" (914) and in 10 through 22 gauge (3.51 through 0.85) galvanized steel as required for application.

Standard sleeve is 12" (305) long x 20 gauge (1.01).

Sleeve gauge must conform to SMACNA Duct Construction Standards and shall not be less than the gauge of the duct to which it is attached for sleeves exposed to the airstream.

3. See individual models for minimum and maximum size limitations.

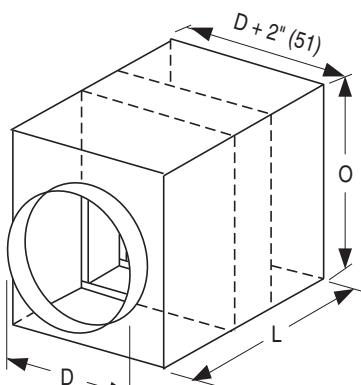
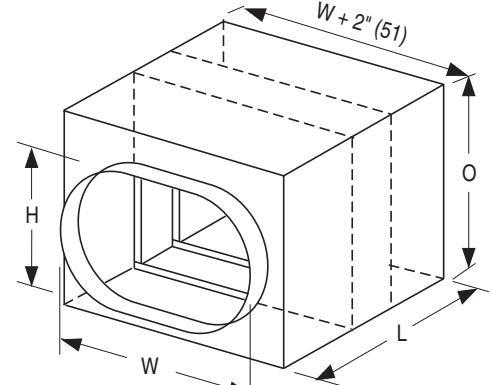
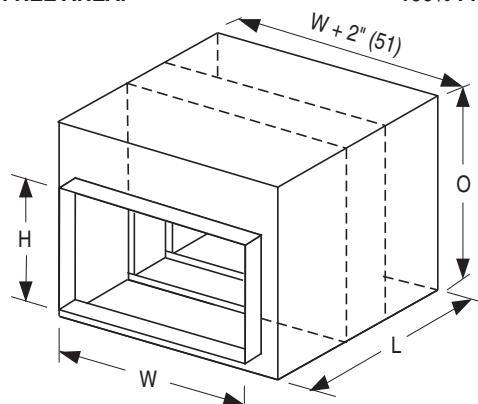
4. Dampers are centered in sleeve unless specified otherwise.

5. Multiple section damper assemblies are shipped knocked down for field assembly.

Type CR, CO and CSR Option:

LP Unsealed. Suitable for low pressure systems.

HP Sealed. Suitable for medium/high pressure systems. Externally caulked (up to 6" w.g./1.5 kPa).


TYPE 'CR'
ROUND TRANSITION COLLARS/DUCT.
100% FREE AREA.

TYPE 'CO'
FLAT OVAL TRANSITION COLLARS/DUCT.
100% FREE AREA.

TYPE 'CSR'
RECTANGULAR TRANSITION COLLARS/DUCT. 100% FREE AREA.

Dimensions are in inches (mm).



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QUALIFICATIONS:

- UL 555 Classified Fire Damper. 1 1/2 hr. label. (File # 9492).
- CAN/ULC-S112 Fire Damper Assemblies.
- Meets all the requirements of UL and NFPA 90A for fire dampers in static HVAC systems.
- Meets the requirements for BOCA, SBCCI, UBC, IBC, NBC (Canada) and associated local building codes.
- California State Fire Marshal Listing No. 03225-0935:113.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.

The 0100 curtain fire dampers are UL approved for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of up to 2 hours. The 0100s are classified for use only in static "fans off" systems where the HVAC system is automatically shut down in the event of a fire alarm.

Integral sleeve fire dampers offer convenience and labor savings. The costly requirement to field or shop fabricate custom sleeves is eliminated and dampers can therefore ship directly from the manufacturer to the job site – saving time and money.

Optional "Quick-Set" retaining angles complete the installation package. Factory fabricated, sized and shipped with damper, they install quickly, provide further labor savings and eliminate the need for any field fabrication.

STANDARD SPECIFICATION:

INTEGRAL

SLEEVE/FRAME: 22 ga. (0.85) roll-formed G60 galvanized steel.
 01 x 4 x -12 Length 12" (305)
 01 x 4 x -14 Length 14" (356)
 01 x 4 x -16 Length 16" (406)

BLADES: Curtain type interlocking blades, 22 ga. (0.85) roll-formed G60 galvanized steel.

FUSIBLE LINK: 165°F (74°C) standard. UL Listed.
 212°F (100°C) available.

BLADE CLOSURE: Vertical mount model; gravity.
 Horizontal mount models are equipped with stainless steel closure springs and galvanized steel locking ramps.

OPTIONS:

- Non-standard temperature fusible link. Specify _____.
- QS1** Quick-set retaining angles (single set).
- QS2** Quick-set retaining angles (pair).

Hemmed Sleeve for slip and drive connection (Type A and B only):

- HM2** (both ends). **HM1** (one end).

Pull Tab Release. Permits simple reset of horizontal damper when access door is located below damper. (See dwg. FDPTR for details).

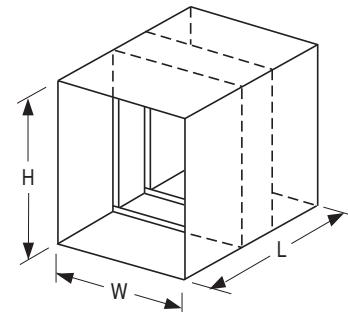
NOTES:

1. Building code and UL Classification require damper installation in accordance with manufacturer's instructions. Refer to documents FDINST, FDTINST and FDSWSINST.

Manufactured by members of S.M.W.I.A.



Refer to the
UL Classification
Marking on the
Product

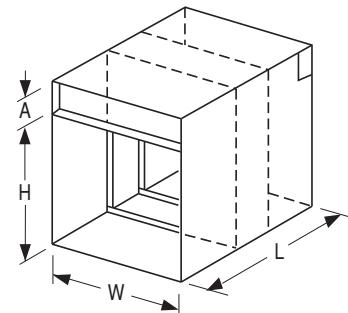


Type 'A' – Blades and frame in the airstream.

Models: 0114V Vertical and 0114H Horizontal

Min. size - Vertical or Horizontal 4" x 4" (102 x 102)

Max. size - Vertical or Horizontal 48" x 48" (1219 x 1219)



Type 'B' – Blades out of airstream.

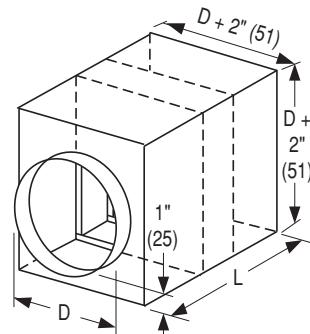
Models: 0124V Vertical and 0124H Horizontal

Min. size - Vertical 4" x 3" (102 x 76)

Horizontal 4" x 4" (102 x 102)

Max. size - Vertical or Horizontal 48" x 43" (1219 x 1092)

Damper Height (H)	Dim. 'A'
5" thru 17" (127 thru 432)	2" (51)
18" thru 27" (457 thru 686)	3" (76)
28" thru 36" (711 thru 914)	4" (102)
37" thru 43" (940 thru 1092)	5" (127)



Type 'CR' – Round transition collars. Blades partially in airstream.

Models: 0134V Vertical and 0134H Horizontal

Min. size - Vertical 3" dia. (76)

Horizontal 4" dia. (102)

Max. size - Vertical or Horizontal 42" dia. (1067)



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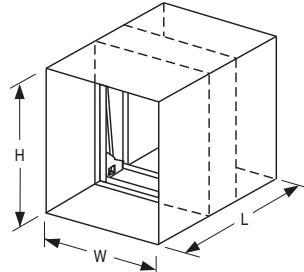
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QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER. 1 1/2 hr. label (File # R9492).
- Meets all the requirements of UL and NFPA 80, 90A and 101 for fire dampers in dynamic HVAC systems, as well as IBC and NBC (Canada) Building Code requirements.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.
- California State Fire Marshal: Fire Damper Listing No. 3225-0935:0113.
- Maximum velocity: 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).



Refer to the
UL Classification
Marking on the
Product

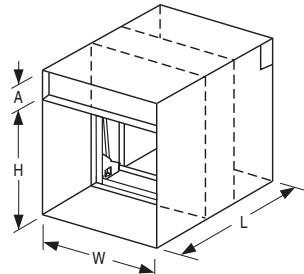


Model: D0114-1X

Type A – Blades and frame in the airstream.

Min. size - 6" x 6" (152 x 152)

Max. size - 36" x 36" (914 x 914)



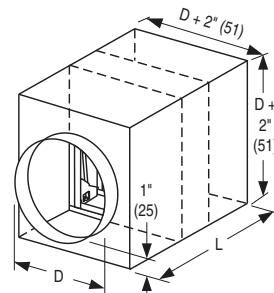
Model: D0124-1X

Type B – Blades out of airstream.

Min. size - 6" x 4" (152 x 102)

Max. size - 36" x 33" (914 x 838)

Damper Height (H)	Dim. 'A'
4" – 17" (102 – 432)	2" (51)
18" – 27" (457 – 686)	3" (76)
28" – 33" (711 – 838)	4" (102)



Model: D0134-1X

Type CR – Round transition collars.

Blades partially in airstream

Min. size - 4" dia. (102)

Max. size - 32" dia. (813)

The D0100 curtain fire dampers are UL approved for use where local building codes require the protection of HVAC ductwork penetrations in walls, partitions or floors that have a fire resistance rating of up to 2 hours. The D0100s are classified for use in dynamic "fans on" systems where the HVAC system remains operative in the event of a fire. Damper closure under airflow is assured.

Integral sleeve fire dampers offer convenience and labor savings. The costly requirement to field or shop fabricate custom sleeves is eliminated and dampers can therefore ship directly from the manufacturer to the job site – saving time and money.

Optional "Quick-Set" retaining angles complete the installation package. Factory fabricated, sized and shipped with damper, they install quickly, provide further labor savings and eliminate the need for any field fabrication.

STANDARD SPECIFICATION:

INTEGRAL

SLEEVE/FRAME: 22 ga. (0.85) roll-formed G60 galvanized steel.

D01 x 4 -12 Length 12" (305)

D01 x 4 -14 Length 14" (356)

D01 x 4 -16 Length 16" (406)

BLADES: Curtain type interlocking blades, 22 ga. (0.85) roll-formed G60 galvanized steel.

FUSIBLE LINK: 165°F (74°C) standard. UL Listed.
212°F (100°C) available.

BLADE CLOSURE: Stainless steel closure springs and galvanized steel locking ramps.

OPTIONS:

Non-standard temperature fusible link. Specify _____.

QS1 Quick-set retaining angles (single set).

QS2 Quick-set retaining angles (pair).

Hemmed Sleeve for slip and drive connection (Type A and B only):

HM2 (both ends). **HM1** (one end).

PT Pull Tab Release. Permits simple reset of spring loaded damper when access door is located below damper (opposite side of locking ramp). (See dwg. ACC-PTR for details).

NOTES:

1. Building code and UL Classification require damper installation in accordance with manufacturer's instructions. Refer to document IOM-FDINST.

Manufactured by members of S.M.W.I.A.

Dimensions are in inches (mm).



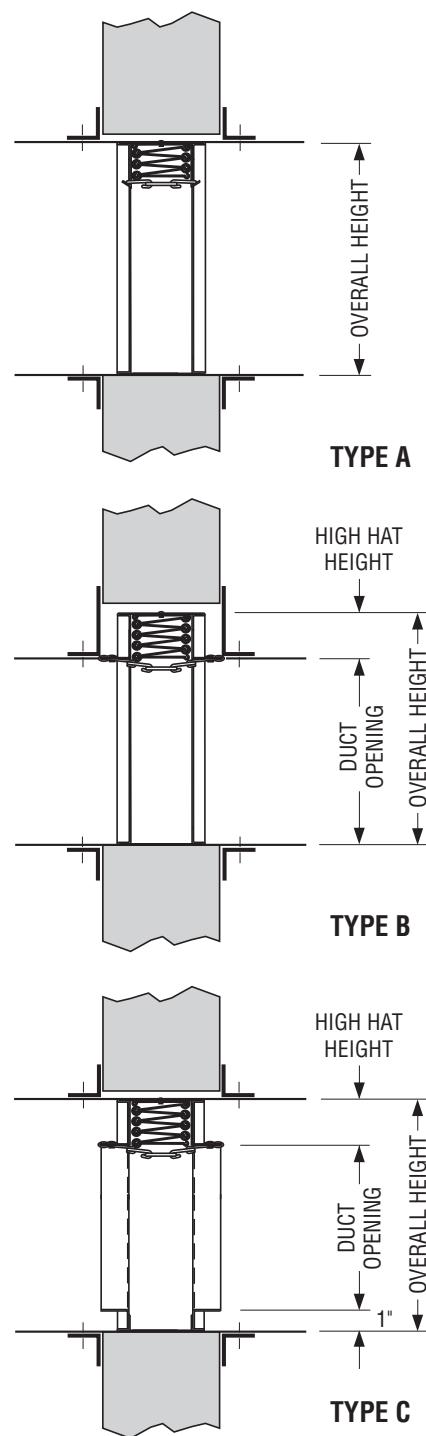
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DUCT OPENING HEIGHT (inches)	TYPE "A" OVERALL HEIGHT (inches)	TYPE "B" OVERALL HEIGHT (inches)	TYPE "C" OVERALL HEIGHT (inches)
4	3 3/4	6 1/8	5 3/4
5	4 3/4	7 1/8	6 3/4
6	5 3/4	8 1/8	8 3/4
7	6 3/4	9 1/8	9 3/4
8	7 3/4	10 1/8	10 3/4
9	8 3/4	11 1/8	11 3/4
10	9 3/4	12 1/8	12 3/4
11	10 3/4	13 1/8	13 3/4
12	11 3/4	14 1/8	14 3/4
13	12 3/4	15 1/8	15 3/4
14	13 3/4	16 1/8	16 3/4
15	14 3/4	17 1/8	17 3/4
16	15 3/4	18 1/8	18 3/4
17	16 3/4	19 1/8	19 3/4
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42	41 3/4	47 1/8	47 3/4
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45	44 3/4	50 1/8	50 3/4
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48	47 3/4	54 1/8	54 3/4
49	48 3/4	55 1/8	55 3/4
50	49 3/4	56 1/8	56 3/4
51	50 3/4	57 1/8	57 3/4
52	51 3/4	58 1/8	58 3/4
53	52 3/4	59 1/8	59 3/4
54	53 3/4	60 1/8	
55	54 3/4		DAMPER WIDTH OVERALL
56	55 3/4		Type "A" = Duct Opening - 1/4".
57	56 3/4		Type "B" = Duct Opening - 1/4".
58	57 3/4		Type "C" = Duct Opening + 1 3/4".
59	58 3/4		
60	59 3/4		



Dimensions are in inches (mm).



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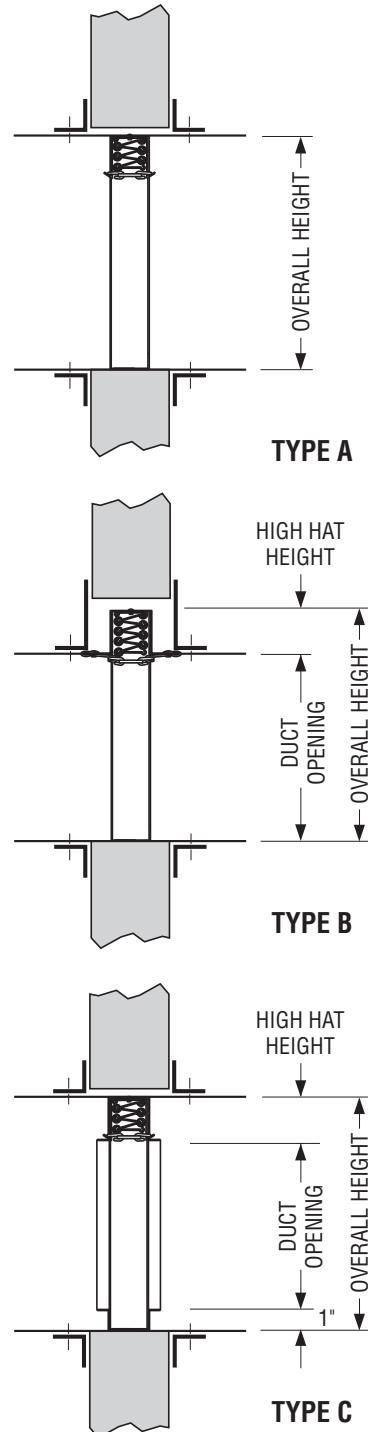
Ft. Lauderdale, Florida
Tel: 954-351-2444
Fax: 954-351-2440

Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

DUCT OPENING HEIGHT (inches)	TYPE "A" OVERALL HEIGHT (inches)	TYPE "B" OVERALL HEIGHT (inches)	TYPE "C" OVERALL HEIGHT (inches)
3		5 1/8	5 3/4
4	3 3/4	6 1/8	6 3/4
5	4 3/4	7 1/8	7 3/4
6	5 3/4	8 1/8	8 3/4
7	6 3/4	9 1/8	9 3/4
8	7 3/4	10 1/8	10 3/4
9	8 3/4	11 1/8	11 3/4
10	9 3/4	13 1/8	13 3/4
11	10 3/4	14 1/8	14 3/4
12	11 3/4	15 1/8	15 3/4
13	12 3/4	16 1/8	16 3/4
14	13 3/4	17 1/8	17 3/4
15	14 3/4	18 1/8	18 3/4
16	15 3/4	20 1/8	20 3/4
17	16 3/4	21 1/8	21 3/4
18	17 3/4	22 1/8	22 3/4
19	18 3/4	23 1/8	23 3/4
20	19 3/4	25 1/8	25 3/4
21	20 3/4	26 1/8	26 3/4
22	21 3/4	27 1/8	27 3/4
23	22 3/4	28 1/8	28 3/4
24	23 3/4	29 1/8	29 3/4
25	24 3/4	30 1/8	30 3/4
26	25 3/4	32 1/8	32 3/4
27	26 3/4	33 1/8	33 3/4
28	27 3/4	34 1/8	34 3/4
29	28 3/4	35 1/8	35 3/4
30	29 3/4	36 1/8	36 3/4
31	30 3/4	37 1/8	37 3/4
32	31 3/4	39 1/8	39 3/4
33	32 3/4	40 1/8	40 3/4
34	33 3/4	41 1/8	41 3/4
35	34 3/4	43 1/8	43 3/4
36	35 3/4	44 1/8	44 3/4
37	36 3/4	45 1/8	45 3/4
38	37 3/4	46 1/8	46 3/4
39	38 3/4	47 1/8	47 3/4
40	39 3/4	48 1/8	48 3/4
41	40 3/4	50 1/8	50 3/4
42	41 3/4	51 1/8	51 3/4
43	42 3/4	52 1/8	52 3/4
44	43 3/4	53 1/8	53 3/4
45	44 3/4	54 1/8	54 3/4
46	45 3/4	55 1/8	55 3/4
47	46 3/4	57 1/8	57 3/4
48	47 3/4	58 1/8	58 3/4
49	48 3/4	59 1/8	59 3/4
50	49 3/4	60 1/8	
51	50 3/4		
52	51 3/4		
53	52 3/4		
54	53 3/4		
55	54 3/4		
56	55 3/4		
57	56 3/4		
58	57 3/4		
59	58 3/4		
60	59 3/4		

DAMPER WIDTH OVERALL
 Type "A" = Duct Opening - 1/4".
 Type "B" = Duct Opening - 1/4".
 Type "C" = Duct Opening + 1 3/4".



Dimensions are in inches (mm).

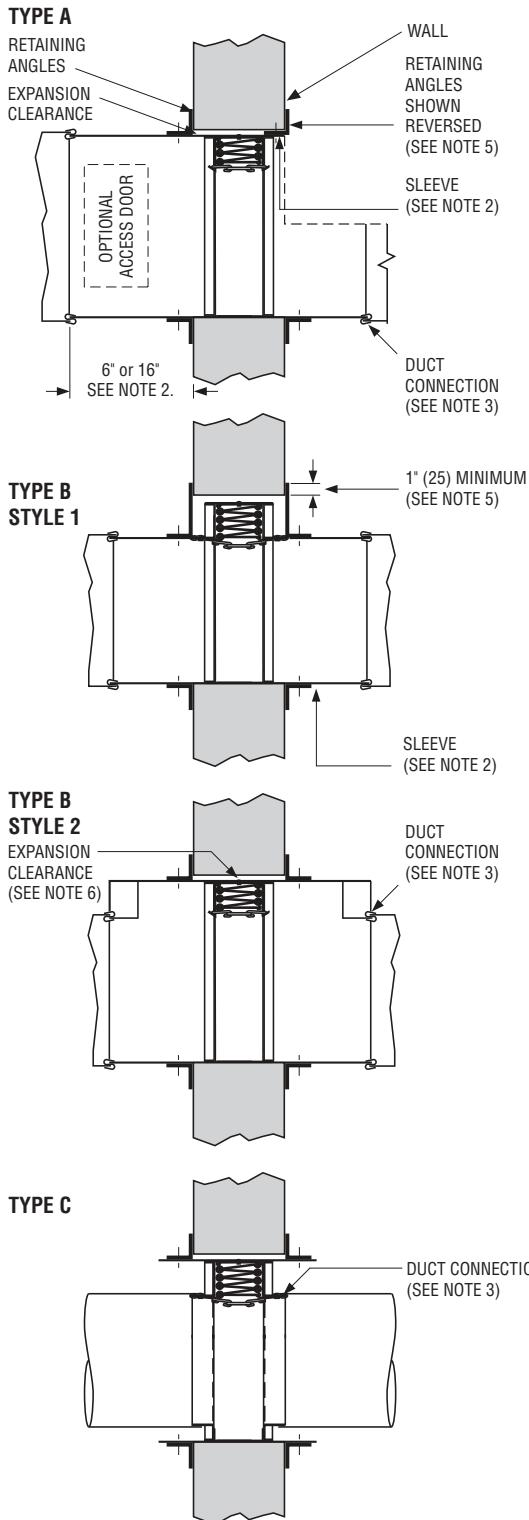


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QUALIFICATIONS:

- Meets all the requirements of UL 555 and CAN/ULC-S112.
- Meets the requirements for NFPA 80, 90A and 101, as well as IBC and NBC (Canada) building codes.
- California State Fire Marshal Listing No. 03225-0935:0113.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.



Refer to the
UL Classification
Marking on the
Product

NOTES:

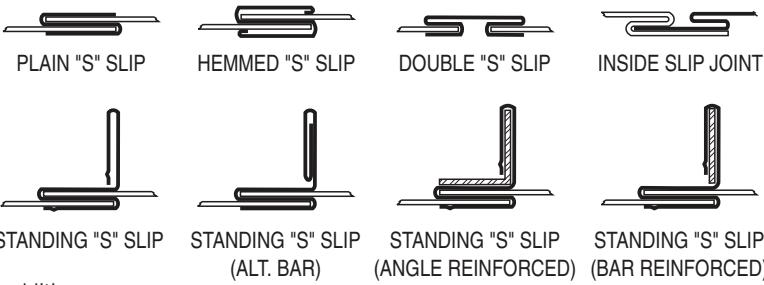
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on one side when incorporating a factory installed access door.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

- a. Round and oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:
 - Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Dimensions are in inches (mm).

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on page 4.

4. Damper/sleeve attachment: Damper shall be secured to sleeve with 1/4" (6) long welds, spot welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonloks on both sides at 6" (152) on center and a maximum of 2" (51) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper.

5. Retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) for dampers up to 90" (2286) in width and up to 90" (2286) in height. For dampers exceeding these dimensions, the angles shall be a minimum of 2" x 2" x 10 gauge (51 x 51 x 3.51). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. Expansion clearance between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. The maximum Type A fire damper sizes are as follows:

Model Series				Single Section	Multiple Section
0100	Static	Vertical	(1 1/2 hr. label)	60" x 60" (1524 x 1524)	120" x 120" (3048 x 3048)
		Horizontal	(1 1/2 hr. label)	60" x 60" (1524 x 1524)	102" x 60" (2591 x 1524) **
0300	Static	Vertical	(1 1/2 hr. label)	60" x 48" (1524 x 1219)	—
		Horizontal	(1 1/2 hr. label)	48" x 48" (1219 x 1219)	—
D0100	Dynamic	Vertical	(1 1/2 hr. label)	36" x 36" (914 x 914)	36" x 48" (914 x 1219) OR ****
		Horizontal	(1 1/2 hr. label)	24" x 24" (610 x 610)	72" x 24" (1829 x 610)
	Static	Vertical	(3 hr. label)	48" x 48" (1219 x 1219)	108" x 72" (2743 x 1829) ***
		Horizontal	(3 hr. label)	36" x 36" (914 x 914)	72" x 36" (1829 x 914)
	0540	Vertical	(3 hr. label)	60" x 48" (1524 x 1219) or 24" x 60" (610 x 1524)	—
		Horizontal	(3 hr. label)	36" x 36" (914 x 914)	36" x 48" (914 x 1219) OR ****
	D0500	Dynamic	Vertical	24" x 24" (610 x 610)	72" x 24" (1829 x 610)
		Horizontal	(3 hr. label)	—	—

* Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

** Maximum individual sections not to exceed 34" x 60" (864 x 1524).

*** Maximum individual sections not to exceed 36" x 36" (914 x 914).

**** Maximum individual sections not to exceed 24" x 24" (610 x 610), up to 48" x 24" (1219 x 610). Assemblies larger than 48" x 24" (1219 x 610) will be made up of individual sections not to exceed 18" x 24" (457 x 610).

8. Multiple Section Assemblies. Individual dampers may be joined together to make multiple section damper assemblies (see Figure 1). The frames shall be fastened together using 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) bolts and nuts, #8 sheet metal screws or 3/16" (4.76) buttonloks on both sides of the damper at 6" (152) max. on center and 2" (51) max. from the corner of the damper on all 4 sides. The following additional requirements shall be met:

Vertical dampers, 1 1/2 hr. label over 84" (2134) in width require a 12 ga. x 4 1/4" (2.75 x 108) wide steel mullion plate placed between adjacent vertical damper frames and the frames fastened together through this with 1/4" (6.35) bolts and nuts, 12" (305) max. on center. Dampers over 84" (2134) in height require a full length 2" x 2" x 10 ga. (51 x 51 x 3.51) steel angle bolted along horizontal joints on both sides of the assembly using 1/4" (6.35) bolts and nuts, 12" (305) max. on center (see Figure 2).

Horizontal dampers, 1 1/2 hr. label over 84" (2134) wide require a 14 ga. x 4 1/4" (1.99 x 108) wide steel mullion plate placed between adjacent damper frames and the frames fastened together through this using 1/4" (6.35) bolts and nuts, 1/4" (6) long welds or #8 sheet metal screws, 4" (102) max. on center.

Vertical dampers, 3 hr. label multiple sections require a 16 ga. x 6" (1.61 ga. x 152) wide "Z" mullion with 7/8" (22) flanges shall be placed between any horizontal joints (see Figure 3). The frames shall be joined together using 3/16" (4.76) bolts and nuts, 1/4" (6) long welds or #8 sheet metal screws, 6" (152) max. on center.

Dimensions are in inches (mm).

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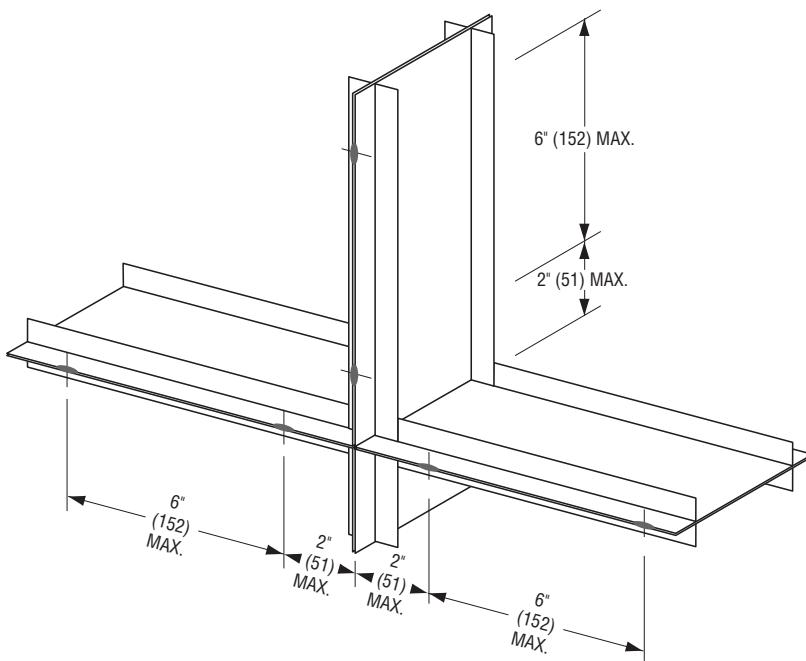


Figure 1.

Fastening of damper frames (see note 8).

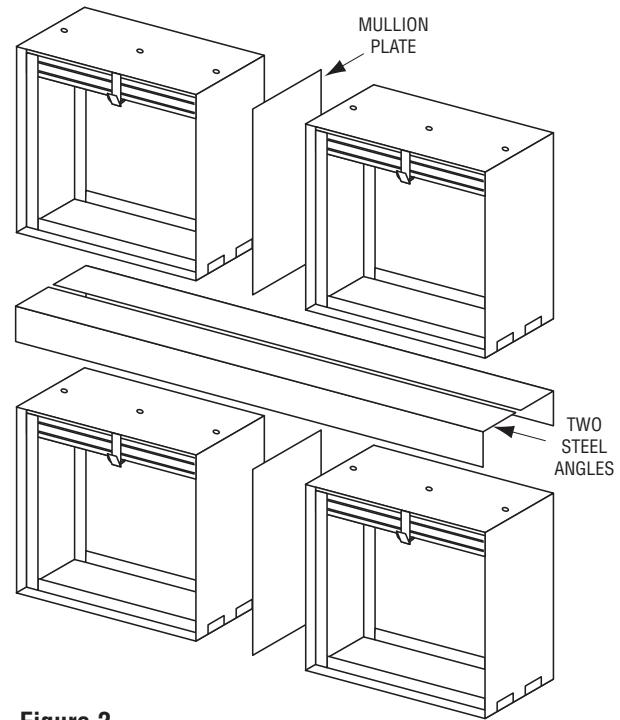


Figure 2.

1 1/2 hr. label vertical installation
over 84" x 84" (2134 x 2134) (see note 8).

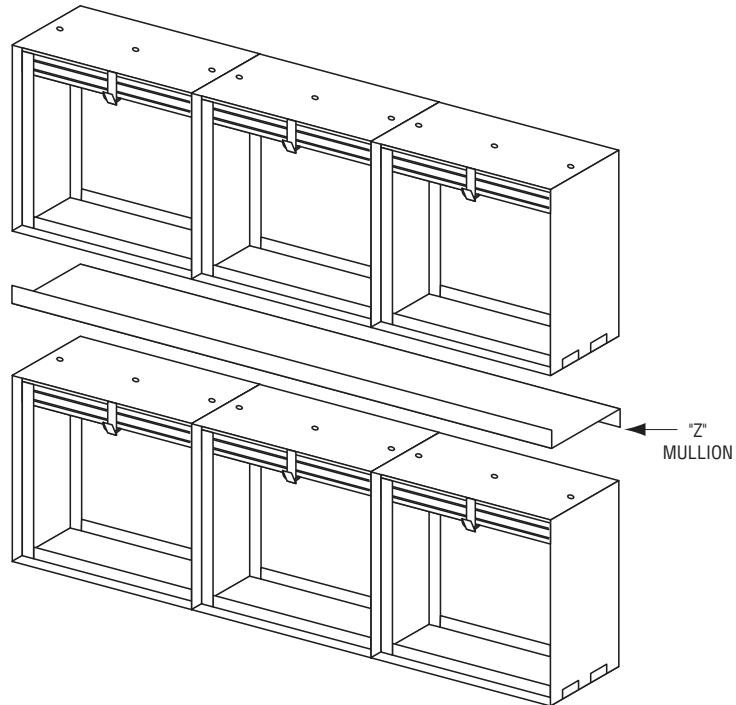


Figure 3.

3 hr. label vertical installation multiple section (see note 8).

9. In cases where the openings are larger than specified in note 7, a UL tested and qualified steel mullion must be provided between assemblies (refer to supplementary installation sheet FDSMINST).

IMPORTANT

DO NOT CAST DAMPER IN PLACE.

DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

VERTICAL MOUNTING SHOWN ON MASONRY WALL.

FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.
HORIZONTAL MOUNTING SIMILAR FOR MASONRY FLOOR.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR THE FOLLOWING SPECIAL REQUIREMENTS:

STEEL MULLIONS (for dampers in oversized wall openings) FDSMINST

SINGLE SIDED RETAINING ANGLES FDSSRAINST

STEEL AND WOOD STUD FRAMING FDSWSFINST

CAVITY SHAFT WALL PARTITIONS FDCSWINST

FLANGED TYPE ALTERNATIVE BREAKAWAY CONNECTIONS FDFABC

TDC/TDF FLANGED DUCT CONNECTION FDTDCFINST

QUICK-SET RETAINING ANGLES FDQSRA

Dimensions are in inches (mm).

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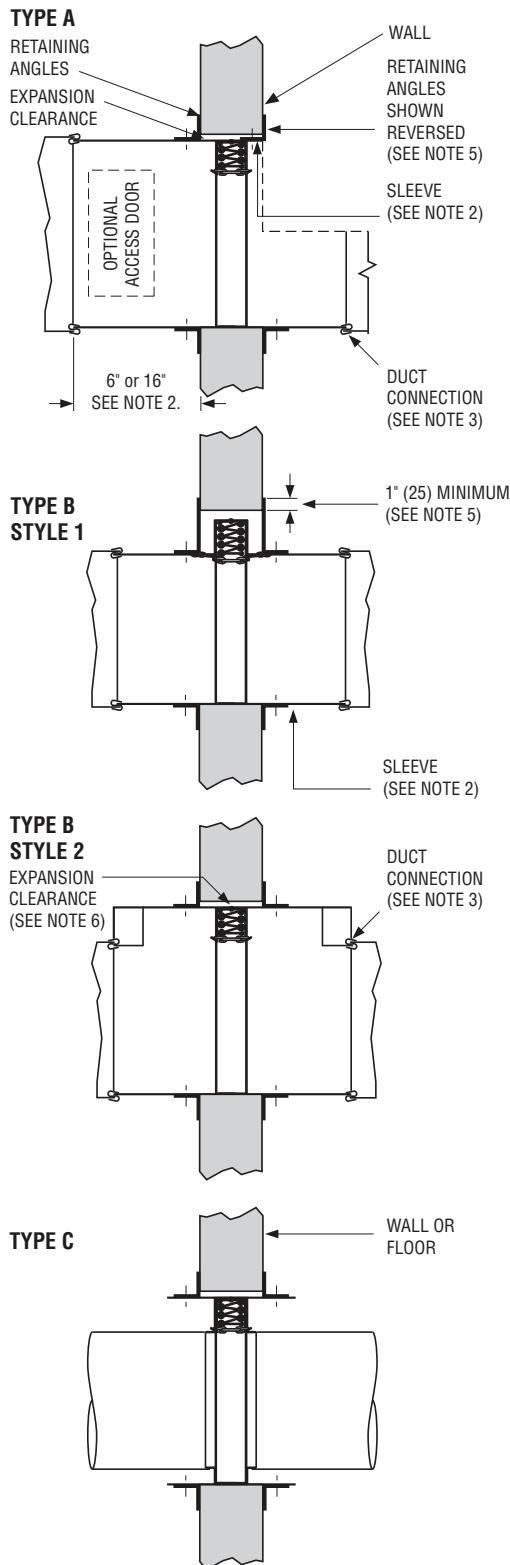


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Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035



QUALIFICATIONS:

- Meets all the requirements of UL 555.
- CAN/ULC-S112 Fire Damper Assemblies.
- Meets the requirements for BOCA, SBCCI, UBC, IBC, NBC (Canada) and associated local building codes.
- California State Fire Marshal Listing No. 03225-0935:100.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.



NOTES:

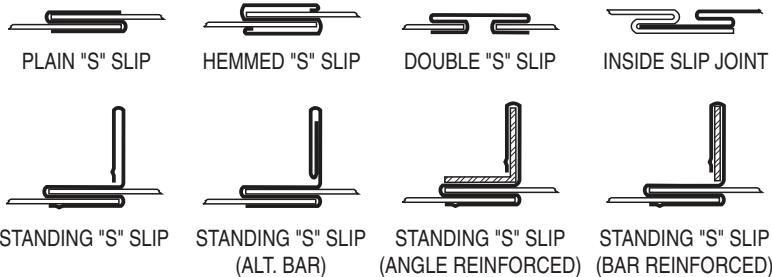
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on one side when incorporating a factory installed access door.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip



FLAT DRIVE SLIP

connections on the side joints may be used for dampers up to 20" (508) in height.

- b. Round and oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
- Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
- Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Dimensions are in inches (mm).

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted below.

4. Damper/sleeve attachment: Damper shall be secured to sleeve with 1/4" (6) long welds on both sides at 6" (152) on center, or 3/4" x 3/4" x 18 gauge (19 x 19 x 1.31) angles all around on both sides attached to the sleeve with #8 sheet metal screws, 3/16" (4.76) steel rivets or 1/4" (6.35) bolts and nuts at 6" (152) on center and a maximum of 2" (51) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper.

5. Retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. The retaining angles are not to be mechanically fastened at the corners.

6. Expansion clearance between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. The maximum Type A fire damper sizes are as follows:

Model Series				Single Section *
0200	Static	Vertical Horizontal	(1 1/2 hr. label) (1 1/2 hr. label)	41" x 36" or 36" x 60" (1041 x 914 or 914 x 1524) 41" x 36" (1041 x 914)
0500	Static	Vertical only	(3 hr. label)	36" x 60" (914 x 1524)

* Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes. Multiple section assemblies are not permitted.

8. In cases when the openings are larger than specified in note 7, a UL tested and qualified steel mullion must be provided between sections. (Refer to supplementary installation document FDSMINST).

IMPORTANT:

DO NOT CAST DAMPER IN PLACE.

DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

VERTICAL MOUNTING SHOWN ON MASONRY WALL.

FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.

HORIZONTAL MOUNTING SIMILAR FOR MASONRY FLOOR.

**REFER TO THE APPROPRIATE NAILOR INSTALLATION SHEETS
FOR THE FOLLOWING SPECIAL REQUIREMENTS:**

STEEL MULLION

(for dampers in oversized wall openings)

FDSMINST

SINGLE SIDED RETAINING ANGLES

FDSSRAINST

STEEL AND WOOD STUD FRAMING

FDSWSFINST

CAVITY SHAFT WALL PARTITIONS

FDCSWINST

DUCTMATE BREAKAWAY CONNECTIONS

FDDMINST

TDC/TDF FLANGED DUCT CONNECTION

FDTDCFINST

QUICK-SET RETAINING ANGLES

FDQSRA

Dimensions are in inches (mm).

Page 2 of 2



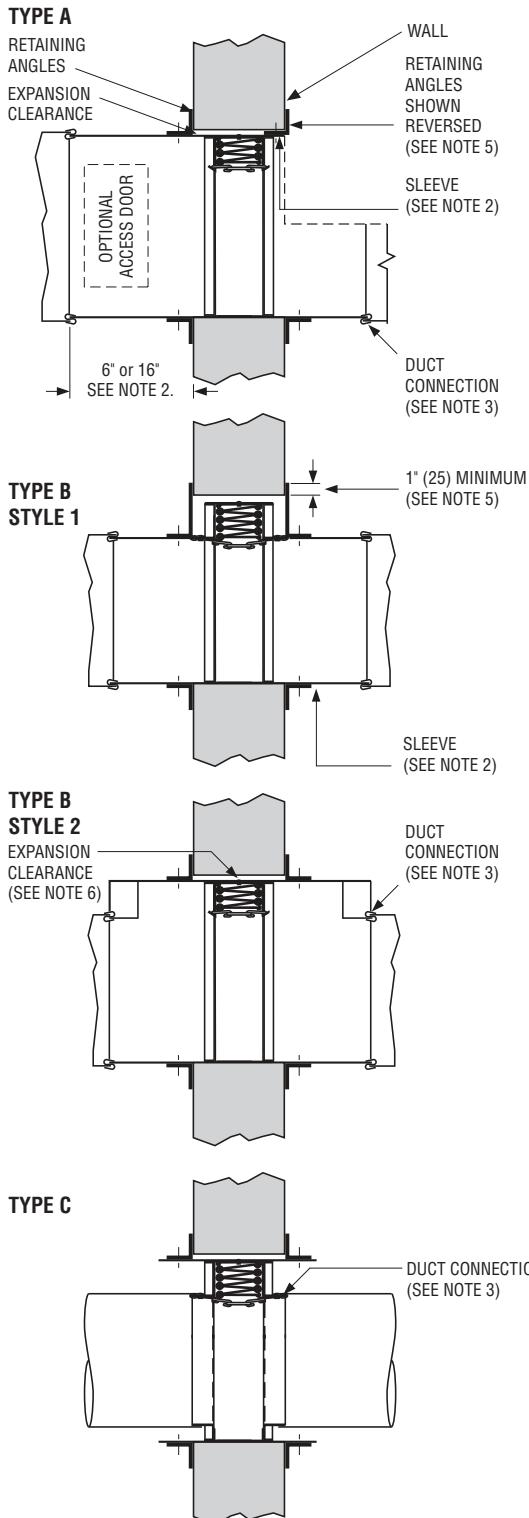
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INSTALLATION INSTRUCTIONS
HYBRID TYPE FIRE DAMPER
1 1/2 HR. LABEL • VERTICAL MOUNT
FOR USE IN DYNAMIC SYSTEMS
MODEL D0100HY



QUALIFICATIONS:

- Meets all the requirements of UL 555 and CAN/ULC-S112.
- Meets the requirements for BOCA, SBCCI, UBC, IBC, NBC (Canada) and associated local building codes.
- California State Fire Marshal Listing No. 03225-0935:113.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.



Refer to the
UL Classification
Marking on the
Product

NOTES:

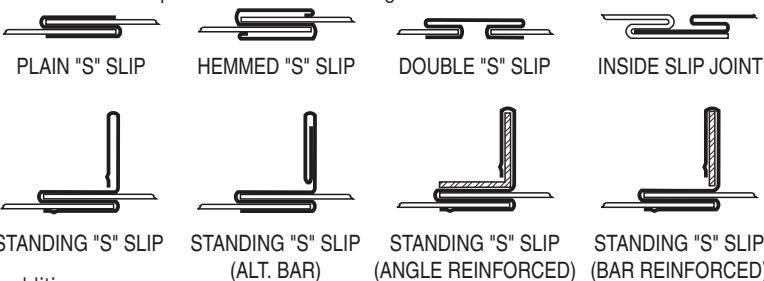
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall opening or 16" (406) on one side when incorporating a factory installed access door.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



- a. Round and oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
- Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
- Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on page 2.

4. Damper/sleeve attachment: Dampers are provided in a factory installed sleeve as standard.

5. Retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. Expansion clearance between the sleeve and wall shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. The maximum Type A fire damper sizes are as follows:

Model Series		Single Section	Multiple Section
D0100HY	Dynamic Vertical (1 1/2 hr. label)	36" x 60" (914 x 1524)	72" x 60" (1829 x 1524)

Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

8. Multiple Section Assemblies. Damper sizes larger than the individual section maximum will be manufactured in multiple sections joined together and fastened in a factory sleeve.

IMPORTANT

DO NOT CAST DAMPER IN PLACE.

DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL.

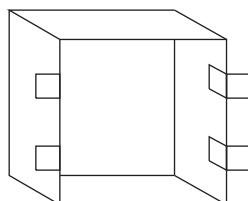
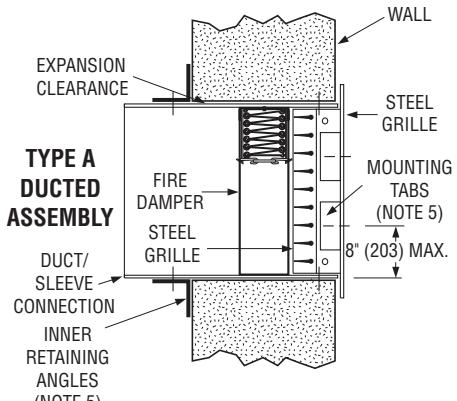
DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

VERTICAL MOUNTING SHOWN ON MASONRY WALL.

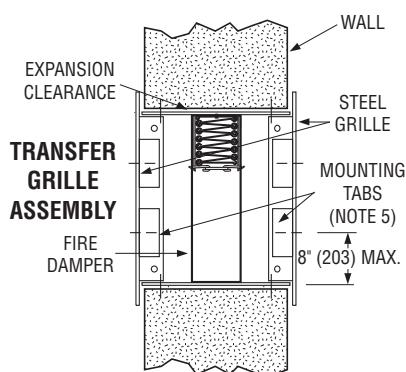
FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR THE FOLLOWING SPECIAL REQUIREMENTS:

SINGLE SIDED RETAINING ANGLES	FDSSRAINST
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA



ISOMETRIC OF TYPICAL SLEEVE/
MOUNTING TABS (NOTE 5)



QUALIFICATIONS:

- Meets all the requirements of UL 555.
- CAN/ULC-S112 Fire Damper Assemblies.
- Meets the requirements for BOCA, SBCCI, UBC, IBC, NBC (Canada) and associated local building codes.
- California State Fire Marshal Listing No. 03225-0935:100/113.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.



Refer to the
UL Classification
Marking on the
Product

NOTES:

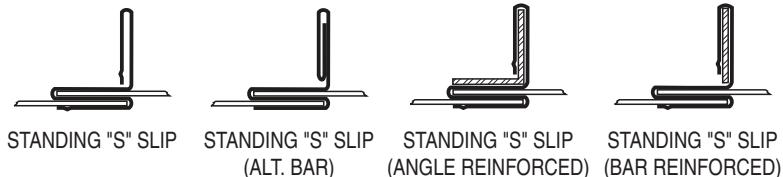
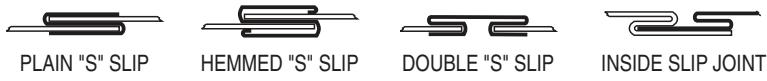
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 24" wide by 24" (610 x 610) high of not less than 16 gauge (1.61) coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) from the wall or floor opening.

3. **Break-away duct/sleeve connections:**

a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

b. Round and oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on next page.

4. Damper/sleeve attachment: The standard blade damper shall be secured to the sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) buttonlocks on both sides at 6" (152) centers and a maximum of 4" (102) from the corners of the damper on all four sides. The thinline blade damper shall be secured to the sleeve with 1/4" (6) long welds on both sides at 6" (152) on center, or 3/4" x 3/4" x 18 gauge (19 x 19 x 1.37 ga.) angles all around on both sides attached to the sleeve with 1/4" (6.35) bolts and nuts, 3/16" (4.76) steel rivets, or #8 sheet metal screws at 6" (152) on center and 2" (51) maximum from the corner of the damper on all four sides.

5. Retaining angles: The inner retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the inner retaining angles, where used, to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) bolts and nuts, 3/16" (4.76) steel rivets, or #8 sheet metal screws at not less than 8" (203) on centers, and 2" (51) maximum from the corners of the sleeve on all four sides. The inner retaining angles must lap the structural opening by 1" (25.4) minimum. Where the sleeve terminates at the wall, either on one or both sides, 1 1/2" x 2" x 20 gauge (32 x 51 x 1.00) mounting angle tabs are fastened to the sleeve. Mounting tabs may be installed on top and bottom, or sides, or a combination of both. Tabs are bent over to a 3/4" (19) flange after installing the damper in the opening. A steel grille frame with a minimum 1" (25.4) flange is then fastened to the mounting angle tabs with sheet metal screws.

6. Expansion clearance: between the sleeve and the wall opening shall be a minimum 1/8" (3.18) per foot of the sleeve in either dimension. The maximum size of the opening shall be 1/8" (3.18) larger in each dimension than the allowable minimum size. For example: a sleeve dimension of 24" x 24" (610 x 610) shall have an opening size of 24 1/4" x 24 1/4" (616 x 616) minimum and 24 3/8" x 24 3/8" (619 x 619) maximum.

7. The Type A fire damper sizes and installation limitations are as follows:

Model Series	System	Mounting	Minimum Size	Maximum Size
0200G	Static	Vertical or Horizontal	(1 1/2 hr. label)	4" x 4" (102 x 102) 24" x 24" (610 x 610)
D0100G	Dynamic or Static	Vertical or Horizontal	(1 1/2 hr. label)	6" x 6" (152 x 152) 24" x 24" (610 x 610)
0100G	Static	Vertical or Horizontal	(1 1/2 hr. label)	4" x 4" (102 x 102) 24" x 24" (610 x 610)

Multiple section assemblies are not permitted.

IMPORTANT

DO NOT CAST DAMPER IN PLACE.
DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL
OR FLOOR.
DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.
VERTICAL MOUNTING SHOWN ON MASONRY WALL.
FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.
HORIZONTAL MOUNTING SIMILAR FOR MASONRY FLOOR.

**REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION
SUPPLEMENTS FOR THE FOLLOWING SPECIAL REQUIREMENTS:**

STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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Tel: 281-590-1172
Fax: 281-590-3086

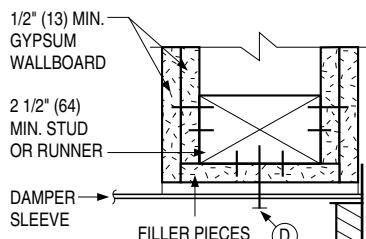
Las Vegas, Nevada
Tel: 702-648-5400
Fax: 702-638-0400

Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

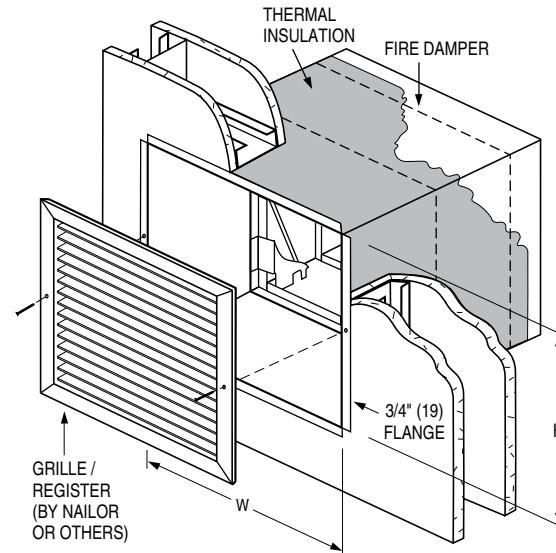
Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

QUALIFICATIONS:

- Meets all the requirements of UL 555 and CAN/ULC-S112.
- Meets the requirements for NFPA 80, 90A and 101 as well as IBC and NBC (Canada) building codes.
- California State Fire Marshal Listing No. 3225-0935:0113/0100.
- Vertical or Horizontal installation.

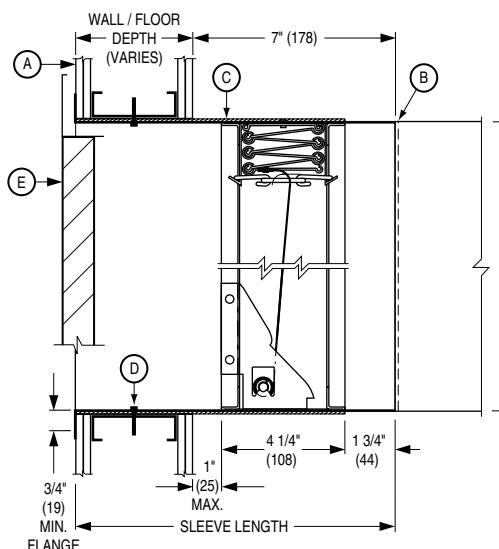


F: Wood Stud Detail

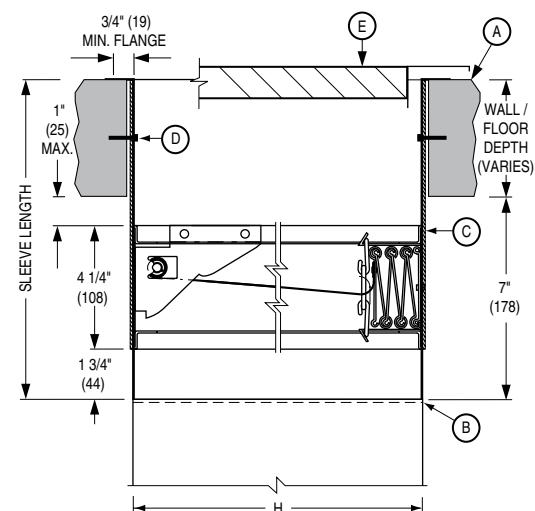


ITEMS:

- A. Typical 2 hour rated vertical steel stud or masonry construction or horizontal concrete fire partition.
- B. Duct connection (see Note 2).
- C. Intumescent thermal insulation.
- D. Fasteners (see note 4):
 - In metal stud/drywall walls and partitions and cavity shaft wall partitions, use #10 sheet metal screws.
 - In masonry wall or floor/ceiling construction, use #10 self-tapping concrete anchors.
 - In Wood Stud, use minimum #10 steel screws.
- E. Steel or Aluminum Grille/Diffuser.
- F. Typical 2 Hour Rated Vertical Wood Stud Construction



VERTICAL MOUNT



HORIZONTAL MOUNT

APPLICATION:

(D)0110GOW are "out of wall" or floor integral sleeve curtain type fire dampers, specifically designed for supply or return ducts that terminate at a grille or register. The (D)0110GOW design provides sufficient damper off-set to accommodate most commercial grille/register designs while ensuring an approved installation in any fire partition or wall no matter how narrow. This model is particularly suited for use in common steel stud drywall partition designs, as narrow as 3 1/2" (89) where a traditional "within the plane of the wall" fire damper installation is not possible.

NOTES:

IMPORTANT: DAMPER IS FURNISHED FULL-SIZE (See Note 3)

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** These dampers are supplied with a factory furnished sleeve which shall not be less than 16 gauge (1.16) coated steel. Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve may be attached to the duct with cleats, screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.
3. **Expansion Clearance and Opening Preparation.** To accommodate the damper sleeve thickness and insulation, frame and finish the opening so that it is 1/2" (13) larger in width and height than the duct size. Dampers are furnished with an inside sleeve dimension full ordered size to facilitate grille installation.

4. Fasteners and Retaining Angles. For installation in a masonry wall or floor/ceiling and metal stud drywall partitions, no rear retaining angles are required. Insert damper/sleeve combination into opening so that the 3/4" (19) flange is tight to the drywall or concrete. Secure the damper in the wall opening from inside the sleeve as shown above by use of the following:

- a. In metal stud/drywall walls, partitions and cavity shaft wall partitions, use minimum #10 sheet metal screws.
- b. In masonry walls or floor/ceilings use minimum #10 self-tapping concrete wall anchors. Anchors must penetrate wall or floor a minimum of 1 1/2" (38).
- c. In wood stud, use minimum #10 steel screws, 2 1/2" (64) long with minimum 1 1/2" (38) penetration into framing.

Maximum distance of damper outside of the barrier shall be 1" (25).

Fasteners shall be spaced a maximum of 6" (152) on center and 2" (51) maximum from corners, a minimum of two per side is required.

Alternatively, 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) rear retaining angles may be used in lieu of the above prescribed method and secured to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws, 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides.

5. Maximum Size Limitations:

Model	System	Mounting	Single Section	Multiple Section
0110GOW	Static	Vertical or Horizontal	36" x 24" (914 x 610)	—
D0110GOW	Dynamic	Vertical or Horizontal	24" x 24" (610 x 610) 24" x 24" (610 x 610)	36" x 24" (914 x 610)* —

* Maximum individual sections not to exceed 18" x 24" (457 x 610)

IMPORTANT

DO NOT CAST DAMPER IN PLACE.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATIVE BREAKAWAY CONNECTIONS	FDFABC
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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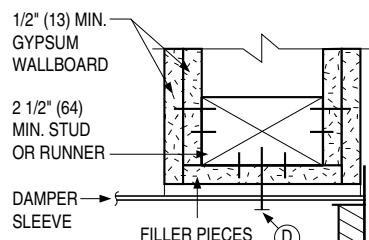
Calgary, Canada
Tel: 403-279-8619
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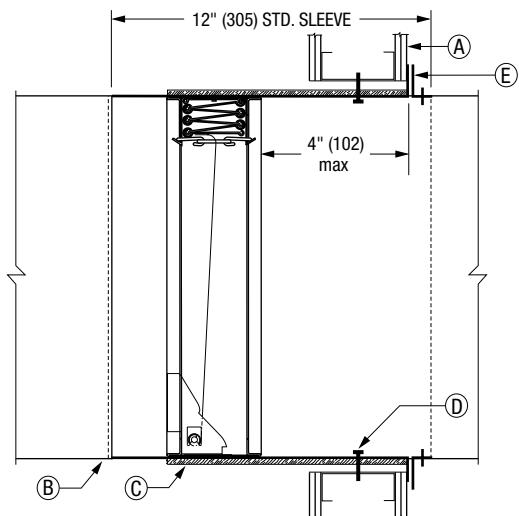
**INSTALLATION INSTRUCTIONS
OUT OF WALL CURTAIN FIRE DAMPER
FOR THROUGH PENETRATIONS
MODEL: (D)0110DOW 1 1/2 HR. LABEL**

QUALIFICATIONS:

- Meets all the requirements of UL 555 and CAN/ULC-S112.
- Meets the requirements for NFPA 80, 90A and 101 as well as IBC and NBC (Canada) building codes.
- California State Fire Marshal Listing No. 3225-0935:0100, 3225-0935:0113.
- City of New York. B00420 of Appeals Cal. No. 460-88-SA.
- Vertical or Horizontal installation.



F: Wood Stud Detail



VERTICAL MOUNT

ITEMS:

- A. Typical 2 hour rated vertical steel stud or masonry construction or horizontal concrete fire partition.
- B. Duct connection (see Note 2).
- C. Intumescent thermal insulation.
- D. Fasteners (see note 4):
 - a. In metal stud/drywall walls and partitions and cavity shaft wall partitions, use #10 sheet metal screws.
 - b. In masonry wall or floor/ceiling construction, use #10 self-tapping concrete anchors.
 - c. In Wood Stud, use minimum #10 steel screws.
- E. Single sided retaining angle.
- F. Typical 2 Hour Rated Vertical Wood Stud Construction

APPLICATION:

(D)0110DOW are "out of wall" or floor integral sleeve curtain type fire dampers, specifically designed for through penetrations (ductwork connected to both sides). This model is particularly suited for use in common steel stud drywall partition designs, as narrow as 3 1/2" (89) where a traditional "within the plane of the wall" fire damper installation is not possible.

NOTES:

IMPORTANT: DAMPER IS FURNISHED FULL-SIZE (See Note 3)

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** These dampers are supplied with a factory furnished sleeve which shall not be less than 16 gauge (1.16) coated steel. Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve may be attached to the duct with cleats, screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.
3. **Expansion Clearance and Opening Preparation.** To accommodate the damper sleeve thickness and insulation, frame and finish the opening so that it is 1/2" (13) larger in width and height than the duct size. Dampers are furnished with an inside sleeve dimension full ordered size to facilitate grille installation.

4. Fasteners and Retaining Angles. For installation in a masonry wall or floor/ceiling and metal stud drywall partitions, a single sided retaining angles is required. Retaining angle shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angle to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all sides. The retaining angle must lap the structural opening by 1" (25.4) minimum. Insert damper/sleeve combination into opening so that the 3/4" (19) flange is tight to the drywall or concrete. Secure the damper in the wall opening from inside the sleeve as shown above by use of the following:

- a. In metal stud/drywall walls, partitions and cavity shaft wall partitions, use minimum #10 sheet metal screws.
- b. In masonry walls or floor/ceilings use minimum #10 self-tapping concrete wall anchors. Anchors must penetrate wall or floor a minimum of 1 1/2" (38).
- c. In wood stud, use minimum #10 steel screws, 2 1/2" (64) long with minimum 1 1/2" (38) penetration into framing.

Fasteners shall be spaced a maximum of 6" (152) on center and 2" (51) maximum from corners, a minimum of two per side is required.

5. Maximum Size Limitations:

Model	System	Mounting	Single Section	Multiple Section
0110DOW	Static	Vertical or Horizontal	36" x 24" (914 x 610)	—
D0110DOW	Dynamic	Vertical Horizontal	24" x 24" (610 x 610) 24" x 24" (610 x 610)	36" x 24" (914 x 610) *

*Maximum individual sections not to exceed 18" x 24" (457 x 610).

IMPORTANT

DO NOT CAST DAMPER IN PLACE.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATIVE BREAKAWAY CONNECTIONS	FDFABC
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

QUALIFICATIONS:

- Meets all the requirements of UL 555 and CAN/ULC-S112.
- Meets the requirements for NFPA 80, 90A and 101 as well as IBC and NBC (Canada) building codes.
- California State Fire Marshal Listing No. 3225-0935:0113/0100.
- Vertical or Horizontal installation.

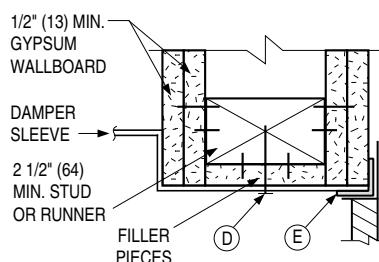


ITEMS:

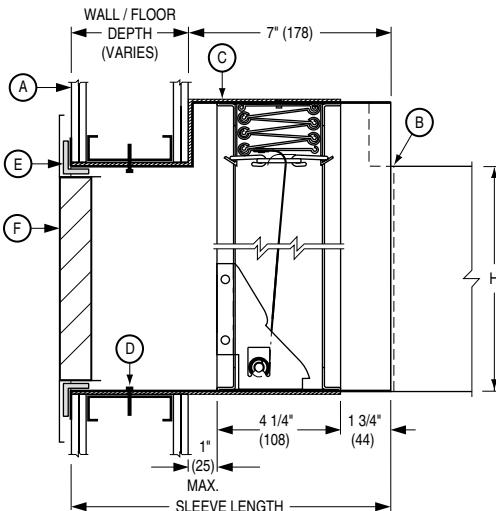
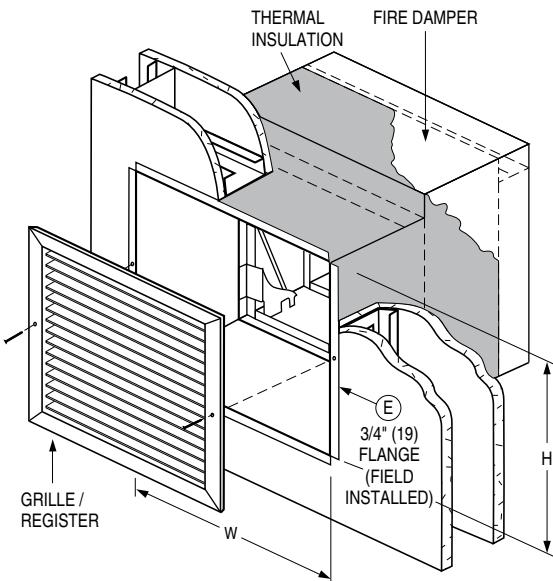
- A. Typical 2 hour rated vertical steel stud or masonry construction or horizontal concrete fire partition.
- B. Duct connection (see Note 2).
- C. Intumescent thermal insulation.
- D. Fasteners (see note 4):
 - a. In metal stud/drywall walls and partitions and cavity shaft wall partitions, use #10 sheet metal screws.
 - b. In masonry wall or floor/ceiling construction, use #10 self-tapping concrete anchors.
 - c. In Wood Stud, use minimum #10 steel screws.
- E. 3/4" (19) Flange (field installed).
- F. Steel or Aluminum Grille/Diffuser.

Typical 2 Hour Rated Partition:

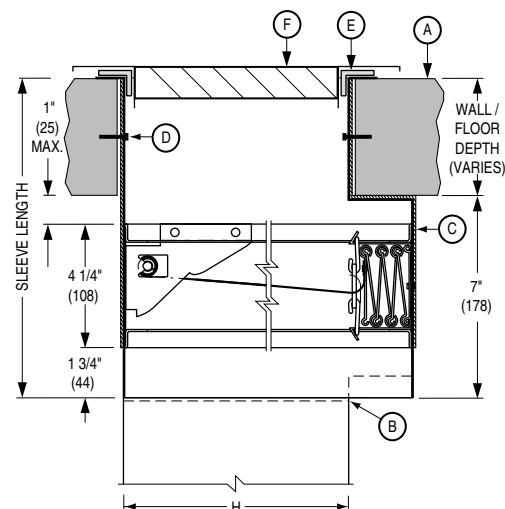
- G. Vertical Wood Stud Construction.
- H. Metal Stud Construction.



G: Wood Stud Detail



VERTICAL MOUNT



HORIZONTAL MOUNT

APPLICATION:

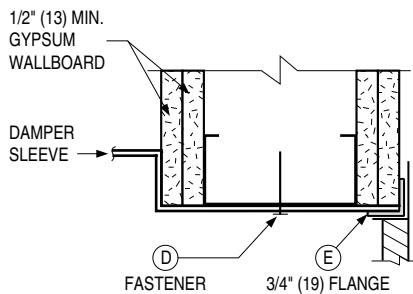
(D)0120GOW are "out of wall" or floor integral sleeve curtain type fire dampers, specifically designed for supply or return ducts that terminate at a grille or register where maximum free area is required.

The (D)0120GOW design provides sufficient damper off-set to accommodate most commercial grille/register designs while ensuring an approved installation in any fire partition or wall no matter how narrow. This model is particularly suited for use in common steel stud drywall partition designs, as narrow as 3 1/2" (89) where a traditional "within the plane of the wall" fire damper installation is not possible.

NOTES:

IMPORTANT: DAMPER IS FURNISHED FULL-SIZE (See Note 3)

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** These dampers are supplied with a factory furnished sleeve which shall not be less than 16 gauge (1.16) coated steel. Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve may be attached to the duct with cleats, screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.
3. **Expansion Clearance and Opening Preparation.** To accommodate the damper sleeve thickness and insulation, frame and finish the opening so that it is 1/2" (13) larger in width and height than the duct size. Dampers are furnished with an inside sleeve dimension full ordered size to facilitate grille installation.



H: Metal Stud Detail

4. Flange / Retaining Angle and Fasteners. For installation in a masonry wall or floor/ceiling and metal stud drywall partitions, no rear retaining angles are required. Insert damper/sleeve combination into opening so that the damper sleeve is flush with wall/grille opening. Attach a full length 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) flange on grille side of sleeve on all four sides (field supplied). Secure the flanges to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. Secure the damper in the wall opening from inside the sleeve as shown above by use of the following:

- In metal stud/drywall walls, partitions and cavity shaft wall partitions, use minimum #10 sheet metal screws.
- In masonry walls or floor/ceilings use minimum #10 self-tapping concrete wall anchors. Anchors must penetrate wall or floor a minimum of 1 1/2" (38).
- In wood stud, use minimum #10 steel screws, 2 1/2" (64) long with minimum 1 1/2" (38) penetration into framing.

Maximum distance of damper outside of the barrier shall be 1" (25).

Fasteners shall be spaced a maximum of 6" (152) on center and 2" (51) maximum from corners, a minimum of two per side is required.

Alternatively, 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) rear retaining angles may be used in lieu of the above prescribed method and secured to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws, 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides.

5. Maximum Size Limitations:

Model	System	Mounting	Single Section	Multiple Section
0120GOW	Static	Vertical or Horizontal	36" x 21" (914 x 533)	—
D0120GOW	Dynamic	Vertical Horizontal	24" x 21" (610 x 533) 24" x 21" (610 x 533)	36" x 21" (914 x 533)* —

* Maximum individual sections not to exceed 18" x 21" (457 x 533)

IMPORTANT

DO NOT CAST DAMPER IN PLACE.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

STEEL AND WOOD STUD FRAMING FDSWSFINST

CAVITY SHAFT WALL PARTITIONS FDCSWINST

FLANGED TYPE ALTERNATIVE BREAKAWAY CONNECTIONS FDFABC

Dimensions are in inches (mm).

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Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

Dampers are an essential part of the fire protection system in a building. The NFPA recommends that fire dampers be tested periodically to verify the operational abilities of each installed damper. See NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, for Operational Test and Periodic Inspection and Testing details.

CAUTION:

Some curtain fire dampers utilize high torque springs under tension; ensure HVAC fans are turned off. Testing spring assisted fire dampers under airflow conditions is **NOT RECOMMENDED** and may severely damage or destroy ductwork. Use protective eyewear or safety glasses. Keep hands out of the blade path, as this can cause serious injury. Keep any hard objects or tools out of the blade path as they can damage the blades when closing.

Periodic Inspection, Testing and Maintenance

Consult your local building code to verify whether there is a required maintenance and testing schedule. Most local jurisdictions reference NFPA 80 for Fire Dampers. Per NFPA 80, each damper should be tested and inspected 1 year after installation and then every 4 years, except for hospitals, where the frequency is every 6 years.

1. Remove any obstructions, dirt, rust, corrosion, or other observed conditions that could impede proper damper operation.

2. Check closure springs (if applicable). If damaged or defective, repair or replace.

3a. Non-Spring Assisted Dampers

Bend metal straps away from damper frame so that they are straight. Remove fusible link and allow the blade package to drop and close naturally by the force of gravity. See Detail 1. Use caution, keeping fingers, hands, arms and tools out of the blade path.

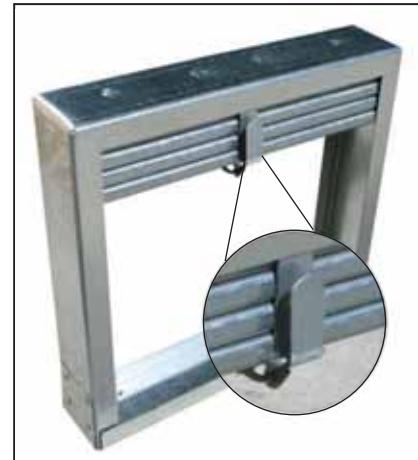
3b. Dynamic Rated or Spring Assisted Dampers

AS SOON AS THE LINK HAS BEEN REMOVED, THE SPRING WILL FORCE THE BLADES TO CLOSE INSTANTANEOUSLY. THE BLADE PATH MUST BE KEPT CLEAR.

4. Ensure the damper closes completely, without assistance. If the damper design incorporates a locking ramp to hold the damper in the fully closed position, confirm that the ramp locks properly.

5. Clean damper blades and other moving parts if necessary. Use of a mild detergent or solvents is recommended for any cleaning required. Lubricate moving parts with a dry lubricant (such as T.F.E. Dry Lube). Never use a regular lubricating oil on dampers, as it will attract dirt and grit.

6. Lift the blade package to the top of the damper to reopen and replace the fusible link. Take care not to rack, deform or damage the blades when reopening.



Detail 1

Reopening spring assisted fire dampers may be extremely difficult and in some cases, impossible. If it is determined that the damper is impossible or impractical to test or reopen, a thorough examination of the blade path is required to ensure that nothing will prevent the damper from closing. Common obstructions include: racked damper frames, retaining angle installation screws, construction debris and contaminants.

7. Slide the replacement fusible link onto the metal straps. When replacing the fusible link, make sure it is the same temperature rating of the link you are replacing. If a different temperature, contact factory. Install fusible link so that the temperature rating is facing outward and is visible.

8. Bend the metal straps up to hold the fusible link in place.

Receiving, Storage, Preparation

Upon delivery, inspect shipping containers and contents closely. Note any damages on freight carrier's delivery receipt. Store dampers in a cool, dry and safe location in an orderly manner away from construction site, warehouse traffic, other materials, etc. Cover with plastic sheeting to protect from excessive moisture, dirt and debris.

Inspect dampers prior to installation. Dampers must be cleaned per procedures outlined in this document prior to installation if dirt, rust or corrosion is observed.

Page 2 of 2

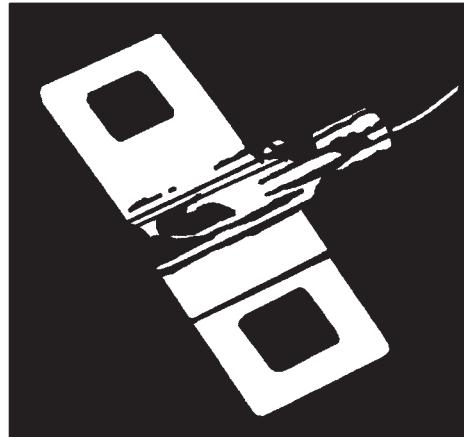
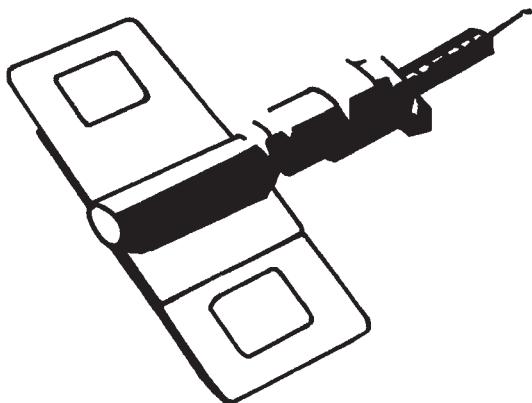


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ETL®

WHAT IT IS – WHAT IT DOES

The Electro Thermal Link (ETL®) is a multi purpose, dual responsive fusible link which reacts (melts) when subjected to;

1. Local heat (165°F (74°C)) exactly the same as an ordinary link.
2. External electrical impulse of low power and short duration.

It is specifically designed to substitute for ordinary links and/or actuators in existing and new installations of Fire Dampers, Fire Doors, Fire Extinguishers, Fire and Smoke Roof Hatches, Sprinklers, Smoke Towers, and chemical or gas Automatic Release Systems.

The substitution should be made in every installation of the above devices where it is desirable to improve life safety by making those devices responsive to -

SMOKE in the early form of invisible products of combustion through ionization detectors, or **FIRE** at an 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 United States today.

The operating range is 6 to 30 volts AC or DC, less than 0.2 ampere of trip current required, and 1/2 millisecond (.0005 second) response at 24 v. The electrical response is a trigger for the chemical heating of the center element which is a self-contained exo-thermic reactor, yielding no noise, smoke, or gas - just quick heat to open the link in seven seconds.

The ETL's thermal response is identical to that of ordinary fusible links of identical temperature (165°F (74°C)) 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 electro-magnetic operator with advantages of simplicity, economy, operational reliability and wide acceptability. With its dual responsiveness the ETL can be substituted for two other devices at a savings in first cost as well as operating cost and maintenance. The ETL is a Space Age Device 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 totally independent of power failures since it draws power from the detector standby source if needed. The ETL is listed by Underwriter's Laboratories, Inc. as a Fusible Link.

With the ongoing development of dynamic smoke control systems and building code changes in recent years, application and use of this product should be governed by acceptance of the local authority having jurisdiction.



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DESCRIPTION:

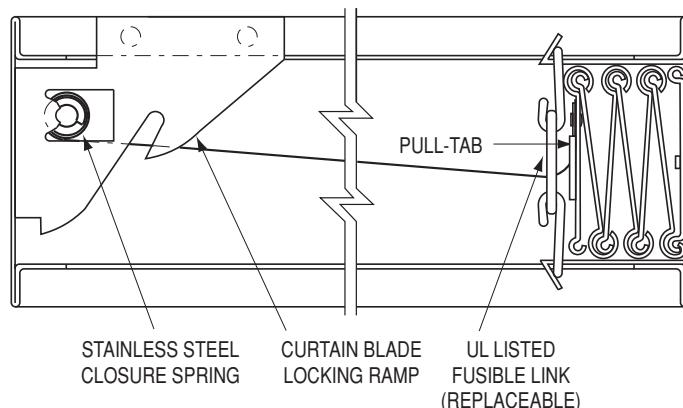
1. Pull ring: 1 1/4 (32) diameter nickel plated steel.
2. Attachment strap: 22 ga. galvanized or stainless steel.

Horizontal curtain type fire dampers for use in static systems and all dynamic dampers utilize stainless steel springs and locking ramps to draw the curtain closed in the event of a fire or upon manual release.

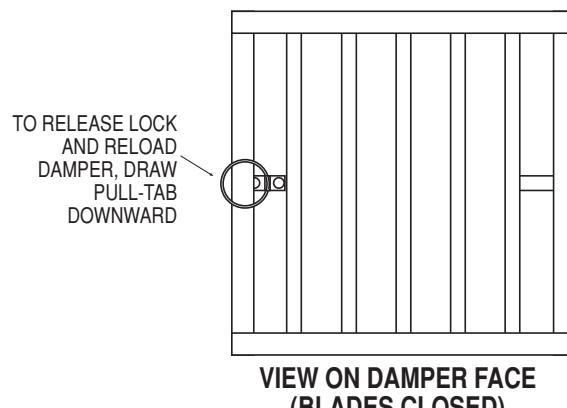
Horizontally installed dampers are designed and tested to be mounted with the locking ramps on the top side. When periodic testing (as well as maintenance and inspection) is required, access doors should be located above the damper, so that the damper blade pack can be "pushed down" and released off the locking ramp for reset.

When access from above is not possible or convenient, the Pull-Tab release option permits simple resetting from beneath the damper.

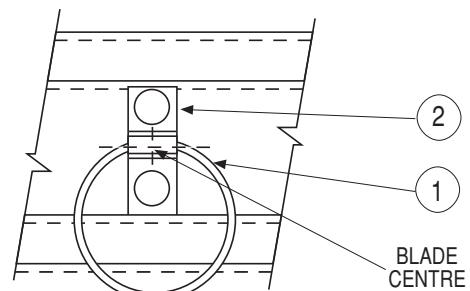
TOP OF UNIT (Horizontal Installation)



TYPE "A" MODEL 0110H (TYPE "B" SIMILAR).



**VIEW ON DAMPER FACE
(BLADES CLOSED)**



DETAIL OF PULL-TAB

Dimensions are in inches (mm).

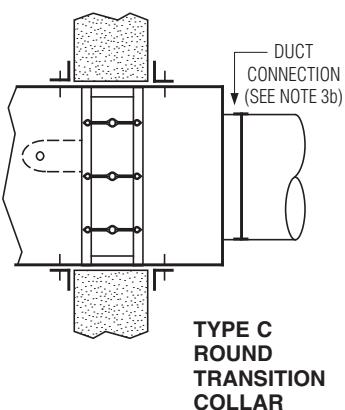
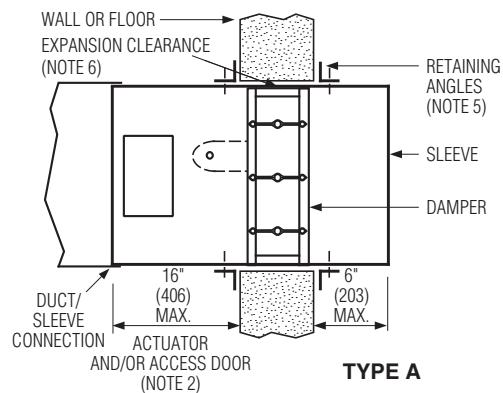
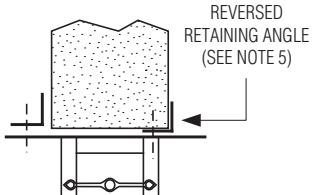


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WARNING: STRONG SPRING UNDER TENSION ON ALL UNITS, KEEP HANDS CLEAR.
IN ALL INSTALLATIONS ENSURE THAT OPERATING DRIVE SHAFT IS FREE FROM OBSTRUCTION TO ENSURE EASE OF OPERATION.

QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER 1 1/2 or 3 hr. Label (File # R9492).
- Meets NFPA 80, 90A and 101 as well as IBC & NBC (Canada) Building Code requirements.
- California State Fire Marshal Listing No. 03225-0935:101.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA (1250) and 366-03-M (1200).



Refer to the UL Classification Marking on the Product

NOTES:

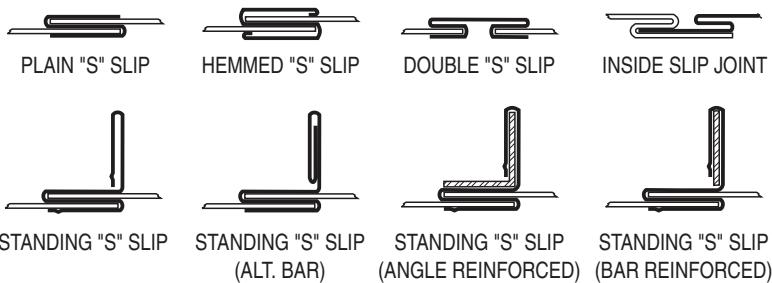
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. Damper Sleeve: Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on a side intended for use with an actuator and/or an access door. The sleeves may extend 16" (406) on each side for use with an actuator on one side and an access door on the other side.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

- b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:
 - Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

- c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on page 2.

Dimensions are in inches (mm).

4. Damper/sleeve attachment: Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonlocks on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper.

5. Retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) for dampers up to 90" (2286) in width and up to 90" (2286) in height. For dampers exceeding these dimensions, the angles shall be a minimum of 2" x 2" x 10 gauge (51 x 51 x 3.51). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. Expansion clearance between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. Maximum Size Limitations: The maximum Type A fire damper sizes are as follows:

Model Series		Single Section	Multiple Section
D1200 (Dynamic)	Vertical	(1 1/2 hr. label)	36" x 48" (914 x 1219)
	Horizontal	(1 1/2 hr. label)	32" x 48" (813 x 1219)
1200 (Static)	Vertical	(1 1/2 hr. label)	36" x 48" (914 x 1219)
	Horizontal	(1 1/2 hr. label)	32" x 48" (813 x 1219)
D1200-3 (Dynamic)	Vertical	(3 hr. label)	36" x 48" (914 x 1219)
	Horizontal	(3 hr. label)	32" x 48" (813 x 1219)
1200-3 (Static)	Vertical	(3 hr. label)	36" x 48" (914 x 1219)
	Horizontal	(3 hr. label)	32" x 48" (813 x 1219)
D1250 (Dynamic)	Vertical	(1 1/2 hr. label)	36" x 48" (914 x 1219)
	Horizontal	(1 1/2 hr. label)	30" x 40" (762 x 1016)

*Individual sections not to exceed 30" x 48" (762 x 1219).

Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

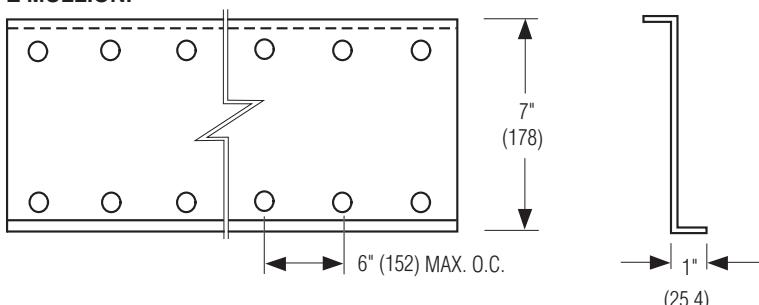
In cases when the openings are larger than specified in note 7, a UL tested and qualified steel mullion must be provided between assemblies (Refer to supplementary installation document FDSMINST). Mullion is for use in 1 1/2 hour static applications only.

8. Actuators and accessories: Nailor multi-blade fire dampers are supplied with an internal locking quadrant as standard to hold damper blades in the open position. If MLS-300 position indicators are used, refer to the proper installation instructions for the MLS-300.

9. Multiple Section assemblies: In multiple assemblies of vertical or horizontal dampers, the frames shall be joined together on both sides of the damper using 1/4" (6) long welds, 1/4" (6.35) dia. bolts and nuts, or #8 sheet metal screws. Maximum 6" (152) on center.

Model Series 1200 multi-section horizontal dampers over two sections wide require a 10 ga. (3.51) Z shaped mullion (shown below). One mullion required for dampers up to 144" (3658) wide. Horizontal damper assemblies, two sections high (deep), require a 10 ga. (3.51) flat mullion between sections (shown below). Mullions and damper frames shall be bolted together with 1/4" (6.35) dia. nuts and bolts on a maximum of 6" (152) on center.

Z MULLION:



IMPORTANT:

DO NOT CAST DAMPER IN PLACE.

DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

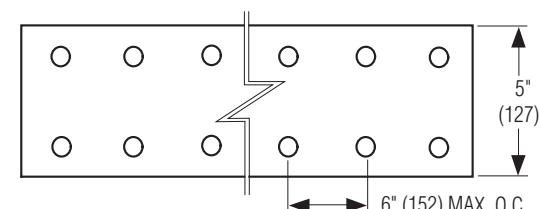
VERTICAL MOUNTING SHOWN ON MASONRY WALL.

FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.

HORIZONTAL MOUNTING SIMILAR FOR MASONRY WALL.

Dimensions are in inches (mm).

FLAT MULLION:



REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR THE FOLLOWING SPECIAL REQUIREMENTS:

STEEL MULLIONS (for dampers in oversized wall openings)	FDSMINST
SINGLE SIDED RETAINING ANGLES	FDSSRAINST
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

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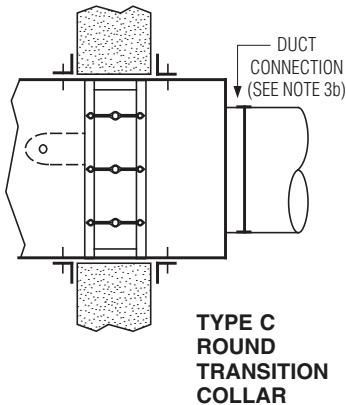
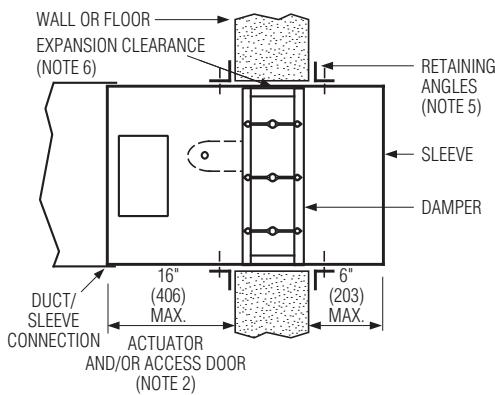
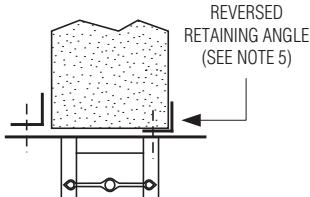
Calgary, Canada
Tel: 403-279-8619
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INSTALLATION INSTRUCTIONS

STAINLESS STEEL MULTI-BLADE FIRE DAMPERS

1 1/2 HOUR LABEL • VERTICAL MOUNTING ONLY

MODEL SERIES (D)1200-SS



WARNING: STRONG SPRING UNDER TENSION ON ALL UNITS, KEEP HANDS CLEAR.
IN ALL INSTALLATIONS ENSURE THAT OPERATING DRIVE SHAFT IS FREE FROM OBSTRUCTION TO ENSURE EASE OF OPERATION.

QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER 1 1/2 hr. Label (File #'s R9492 & R19569).
- Meets NFPA 80, 90A and 101 as well as IBC & NBC (Canada) Building Code requirements.



Refer to the
UL Classification
Marking on the
Product

NOTES:

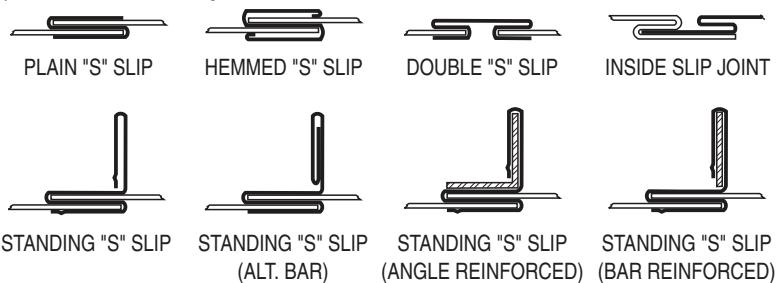
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) galvanized or stainless steel, or larger sleeves of not less than 14 gauge (1.99) thick steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51).

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on a side intended for use with an actuator and/or an access door. The sleeves may extend 16" (406) on each side for use with an actuator on one side and an access door on the other side.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



- b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:
 - Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

- c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on page 2.

4. **Damper/sleeve attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 1/4" (6.35) dia. bolts and nuts or #10 sheet metal screws on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper.

Dimensions are in inches (mm).

5. Retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) steel for dampers up to 90" (2286) in width and up to 90" (2286) in height. For dampers exceeding these dimensions, the angles shall be a minimum of 2" x 2" x 10 gauge (51 x 51 x 3.51). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts or #10 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. Expansion clearance between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. Maximum Size Limitations: The maximum Type A fire damper sizes are as follows:

Model Series

1200-SS (Static) Vertical (1 1/2 hr. label)
D1200-SS (Dynamic) Vertical (1 1/2 hr. label)

Single Section

36" x 48" (914 x 1219)
36" x 48" (914 x 1219)

Multiple Section

144" x 96" (3658 x 2438)
72" x 96" (1829 x 2438) or 144" x 48" (3658 x 1219)

Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

In cases when the openings are larger than specified in note 7, a UL tested and qualified steel mullion must be provided between assemblies (Refer to supplementary installation document FDSMINST). Mullion is for use in static applications only.

8. Actuators and accessories: Nailor multi-blade fire dampers are supplied with an internal locking quadrant as standard to hold damper blades in the open position. If MLS-300 position indicators are used, refer to the proper installation instructions for the MLS-300.

9. Multiple-section assemblies: In multiple assemblies of vertical dampers, the frames shall be joined together on both sides of the damper using 1/4" (6) long welds, 1/4" (6.35) dia. bolts and nuts, or #8 sheet metal screws. Maximum 6" (152) on center.

Multiple section vertical damper assemblies, over two sections wide, require a 10 ga. (3.51) x 5" (127) flat vertical mullion between one pair of sections (see Figure 1). When a minimum 16 ga. (1.6) sleeve is used and a left and right section are sleeved separately, the sleeve acts as the mullion, therefore no mullion is required. The sleeves shall be joined together on both sides of the damper using 1/4" (6) long welds, 1/4" (6.35) dia. bolts and nuts or #8 sheet metal screws. Maximum 6" (152) on center (see Figure 2).

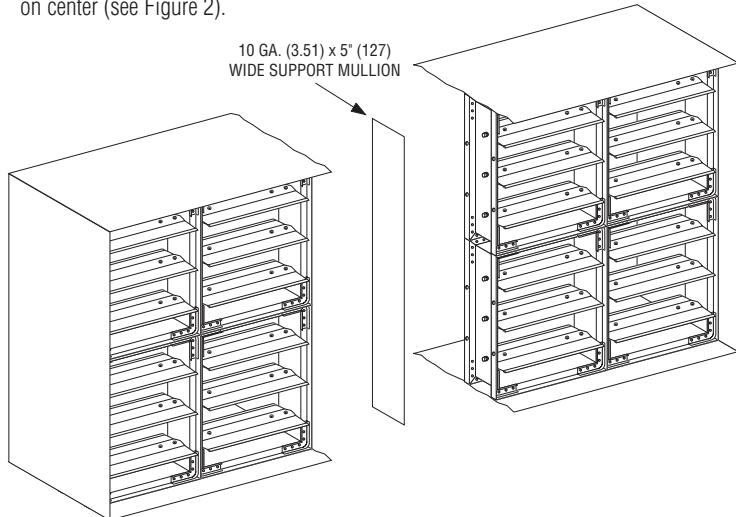


Figure 1. Single sleeve around outside and vertical mullion

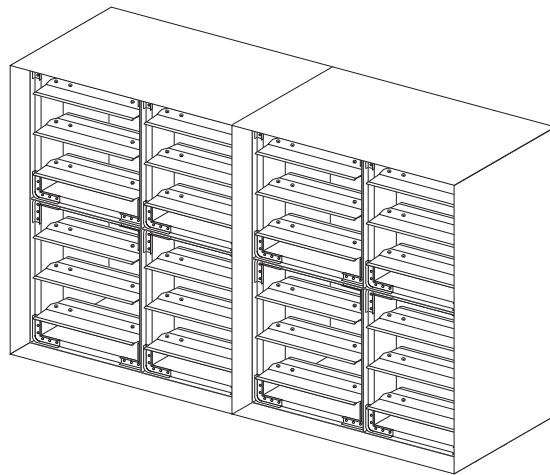


Figure 2. Two individually sleeved units (No mullion required)

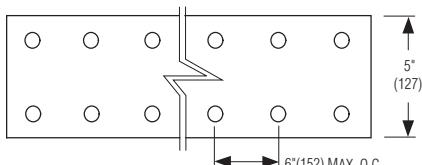


Figure 3. Flat Mullion

IMPORTANT:

DO NOT CAST DAMPER IN PLACE.

DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.

DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.

VERTICAL MOUNTING SHOWN ON MASONRY WALL.

FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR THE FOLLOWING SPECIAL REQUIREMENTS:

STEEL MULLIONS (for dampers in oversized wall openings) FDSMINST

SINGLE SIDED RETAINING ANGLES FDSSRAINST

STEEL AND WOOD STUD FRAMING FDSWSFINST

CAVITY SHAFT WALL PARTITIONS FDCSWINST

DUCTMATE BREAKAWAY CONNECTIONS FDDMINST

TDC/TDF FLANGED DUCT CONNECTION FDTCFINST

QUICK-SET RETAINING ANGLES FDQSRA

Dimensions are in inches (mm).

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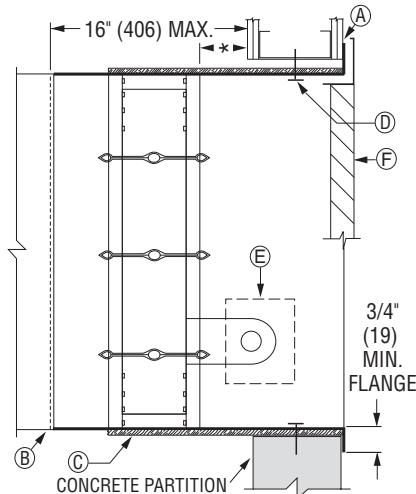
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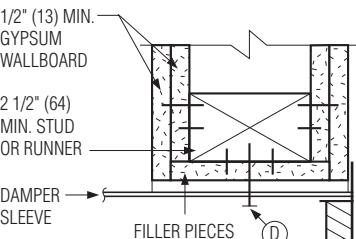
Refer to the
UL Classification
Marking on the
Product

ITEMS:

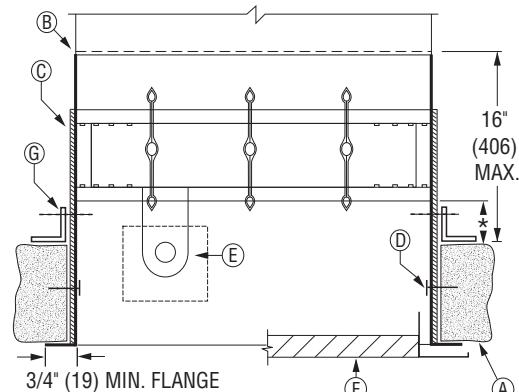
- A** Typical 2 hour rated vertical concrete or steel stud construction and horizontal concrete fire partition
- B** Duct connection (see Note #3)
- C** Intumescent material (insulation)
- D** #10 steel screws or concrete anchors (see Note #5)
- E** Manual Locking Quadrant
- F** Grille/Diffuser
- G** Rear retaining angle (see Note #5)
- H** Typical 2 Hour Rated Vertical Wood Stud Construction



VERTICAL MOUNT



H: Wood Stud Detail



HORIZONTAL MOUNT

QUALIFICATIONS:

- Meets all the requirements of UL 555 and CAN/ULC-S112.
- Meets the requirements for NFPA 80, 90A and 101 as well as IBC and NBC (Canada) building codes.
- California State Fire Marshal Listing No. 03225-0935:0101.
- City of New York. MEA #366-03-M.

*NOTE: Damper to be located maximum 8" (203) out of wall/floor.

NOTES:

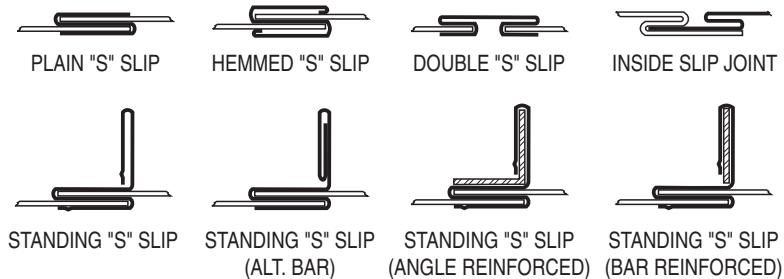
IMPORTANT: DAMPER IS FURNISHED FULL-SIZE (See Note #4)

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** Factory furnished sleeves shall not be less than 20 gauge. (1.01) coated steel. Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) from the wall.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
- Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
- Duct diameters larger than 36" (914) high or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

4. Opening Size: Dampers are furnished full ordered size to facilitate grille installation. Opening size in partition should be sized 1/2" (13) larger in all directions to allow for sleeve thickness and insulation.

5. Fasteners and Retaining Angles. For installation in a masonry wall or floor/ceiling and metal stud drywall partitions, no rear retaining angles are required. Insert damper/sleeve combination into opening so that the 3/4" (19) flange is tight to the drywall or concrete. Secure the damper in the wall opening from inside the sleeve as shown above by use of the following:

- In metal stud/drywall walls, partitions and cavity shaft wall partitions, use minimum #10 sheet metal screws.
- In masonry walls or floor/ceilings use minimum #10 self-tapping concrete anchors. Anchors must penetrate wall minimum 1 1/2" (38).
- In wood stud, use minimum #10 steel screws, 2 1/2" (64) long with minimum 1 1/2" (38) penetration into framing.

Fasteners shall be spaced a maximum of 6" (152) on center and 2" (51) maximum from corners, a minimum of two per side is required.

Alternatively, 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) rear retaining angles may be used in lieu of the above prescribed method and secured to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws, 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides.

6. Maximum Size Limitations: Vertical: 36" x 48" (914 x 1219), Horizontal: 32" x 48" (813 x 1219). Minimum size is 8" x 8" (203 x 203).

7. Actuator and accessories: Nailor multi-blade fire dampers are supplied with a hand locking quadrant as standard to hold blades in the open position. If MLS-300 position indicators are used, refer to the proper installation instructions for the MLS-300.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATIVE BREAKAWAY CONNECTIONS	FDFABC
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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QUALIFICATIONS:

International Maritime Organization Fire Test Procedures Code
 USCG Type Approval A-60. Approval Number 164.139/8/0.

European Wheel Mark  1408/05.

Southwest Research Institute Test report No. 01.10933.01.701.

MINIMUM SIZE: Vertical or Horizontal mount: 8" x 8" (200 x 200).

MAXIMUM SIZE: Single Section

Vertical or Horizontal mount: 36" x 36" (915 x 915).

Multiple Section Assembly

Vertical or Horizontal mount: 72" x 36" (1830 x 915).

Nailor's Model 1201-MDG (galvanized), and 1201-MDS (stainless steel) marine fire dampers have been tested for 60 minutes, in both a Class A bulkhead and Class A deck, in accordance with the International Maritime Organization's Fire Test Procedure (FTP). Dampers are required by FTP to be welded or bolted to the ductwork (coaming) as described below, and that the ductwork (coaming) be insulated as described below. See Figures 1 and 2 below.

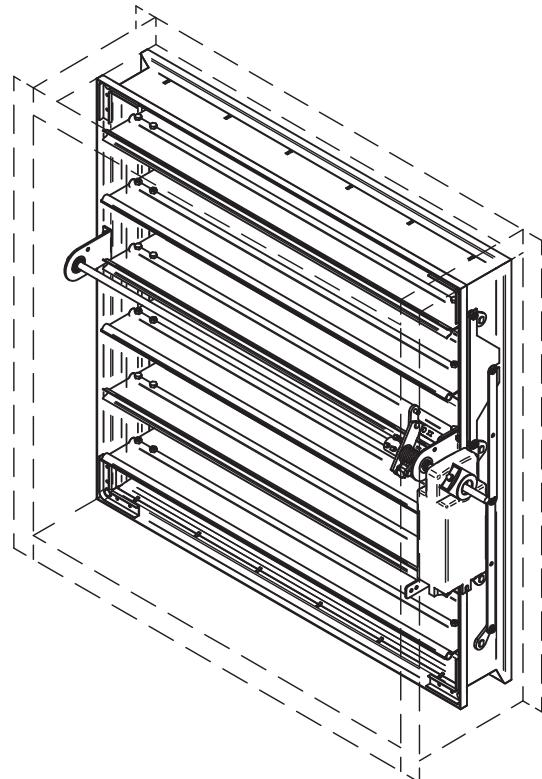
The ductwork (coaming) must be insulated on the damper side a minimum of 6" (152 mm) and also on the non-damper side a minimum of 18" (457 mm), using any A60 rated U.S. Coast Guard approved insulation. Install the insulation with 0.106" (2.7 mm) steel pins and 1.12" x 1.24" x 0.4" (28 mm x 31 mm x 10 mm) steel clips.

Either 3/8" (9.5 mm) by 1" (25 mm) long bolts, or welding may be used to attach damper to ductwork (coaming). Whether bolts or welding are used, the fasteners should be placed on 6" (152 mm) centers, and no more than 2" (51 mm) from corners.

Available pneumatic actuators: 331-2961 and 331-4826.

Available electric actuators: MS4120F, MS4620F, MS8120F, MS4x09F, or MS8x09F.

See installation instructions for each actuator.



Shown with an electric actuator and RH mounting. Pneumatic actuators, hand locking quadrant and LH mounting are available.

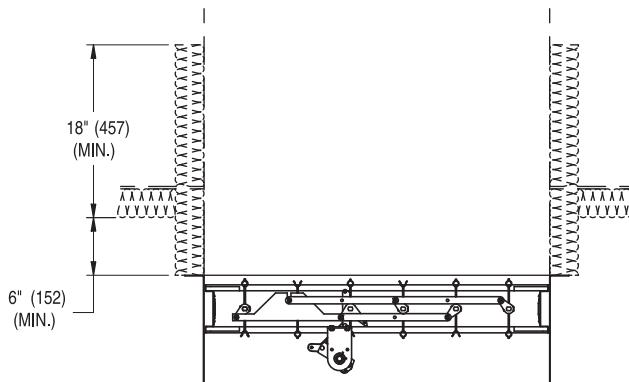


Fig. 1: Horizontal damper mount

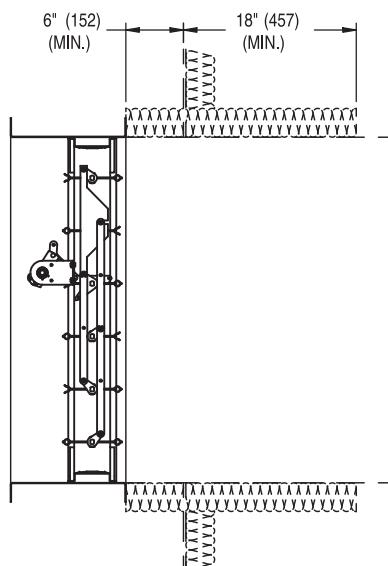


Fig. 2: Vertical damper mount



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Fax: 403-279-5035

QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 Hour Label (File # R9492).
- Meets NFPA 80, 90A and 101 as well as IBC and NBC (Canada) requirements.
- California State Fire Marshal: Fire Damper Listing No. 3225-0935:0101.
- Maximum velocity 4000 fpm @ 4" w.g. (20 m/s @ 1 kPa).
- For use in vertical or horizontal concrete partitions and vertical steel stud or wood stud partitions only.



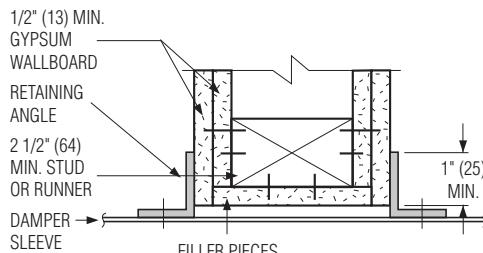
Refer to the
UL Classification
Marking on the
Product

APPLICATION:

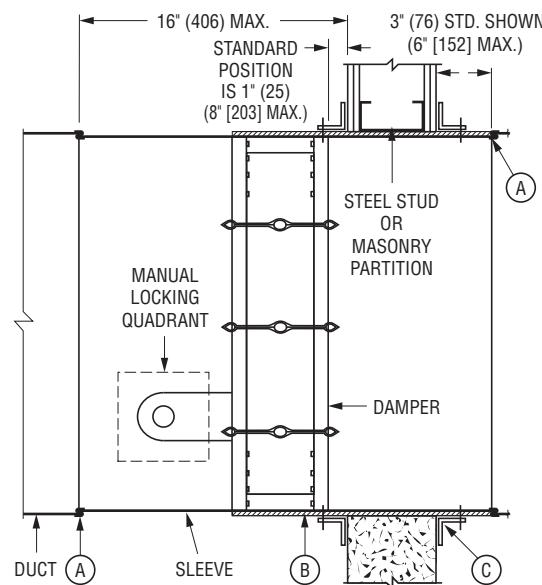
Model D1201-DOW fire damper is specially designed for "out of wall" (vertical mount) or "out of floor" (horizontal mount) through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor.

ITEMS:

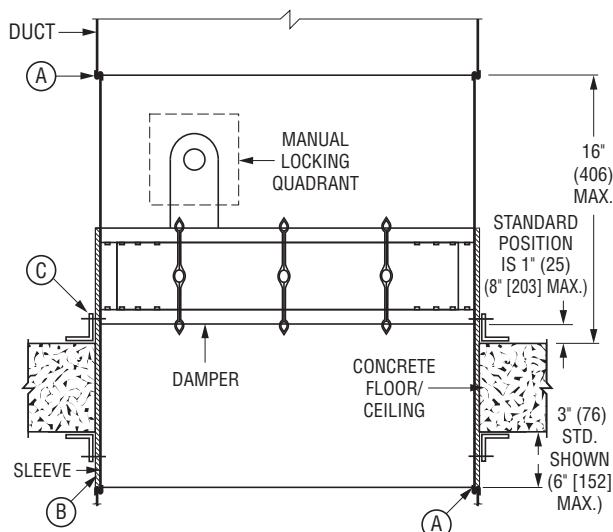
- (A) Duct/sleeve connection (See Note #4).
- (B) Intumescent material (insulation).
- (C) Retaining angles and fasteners (See Note #6).
- (D) Typical 2 Hour Rated Vertical Wood Stud Construction



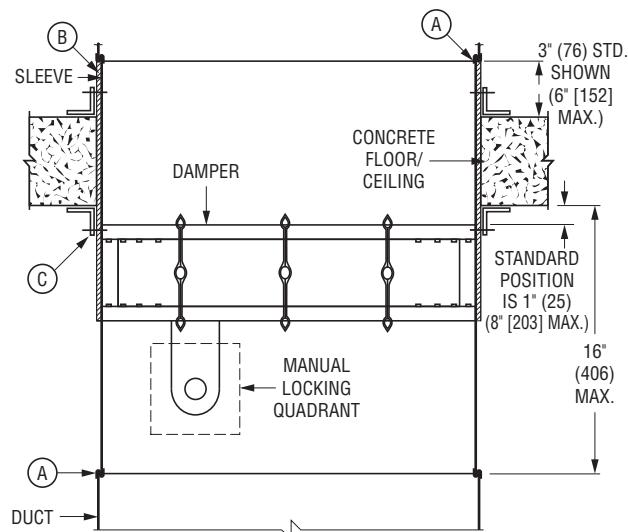
D: Wood Stud Detail



VERTICAL INSTALLATION



ABOVE FLOOR INSTALLATION

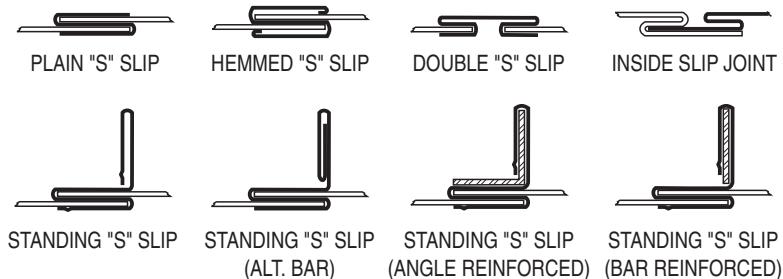


BELLOW FLOOR INSTALLATION

NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Location Within Sleeve:** The maximum distance that the leading edge of the damper frame can be installed outside the wall or floor is as follows:
Steel Stud, Wood Stud or Masonry Walls: 8" (203).
Concrete Floors: 8" (203).
3. **Damper Sleeve:** Factory furnished sleeves shall not be less than 20 gauge. (1.01) coated steel.
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.
The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) from the wall/floor on the damper/actuator side and maximum 6" (152) on the other side.
4. **Break-away duct/sleeve connections:**

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 3 for rigid connections:



In addition:

- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:
 - Duct diameters 22" (559) and smaller may use three #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters larger than 36" (914) high or diameter may use eight #10 sheet metal screws equally spaced around the circumference.
- For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

5. **Opening Size:** Expansion clearance is not required, however the opening size in partition should be sized 1/2" (13) larger than nominal damper size in all directions to allow for sleeve thickness and insulation.

6. **Retaining Angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws, 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. Field fabricated retaining angles are not to be mechanically fastened at the corners.

7. **Maximum Size Limitations:** Vertical: 36" x 48" (914 x 1219), Horizontal: 32" x 48" (813 x 1219). Minimum size is 8" x 8" (203 x 203).

8. **Actuator and Accessories:** Nailor multi-blade fire dampers are supplied with an internal locking quadrant as standard to hold damper blades in the open position. If MLS-300 position indicators are used, refer to the proper installation instructions for the MLS-300.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS

FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Nailor) POSITION INDICATOR	MLS3N
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATE BREAKAWAY CONNECTIONS	FDFABCINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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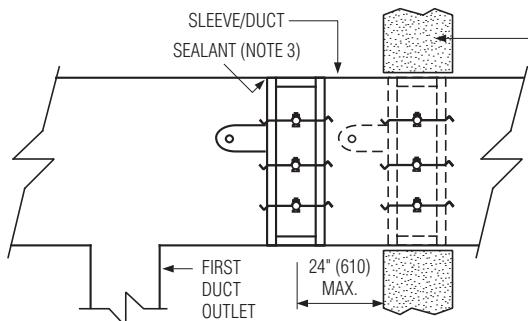
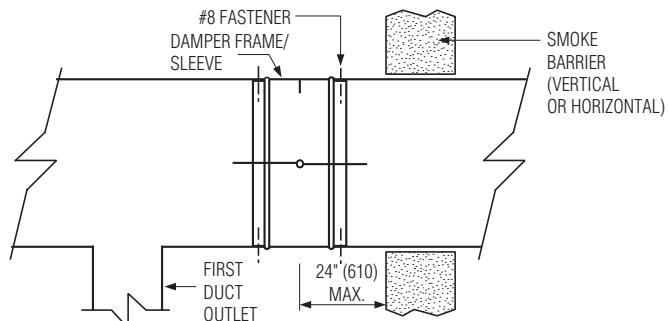


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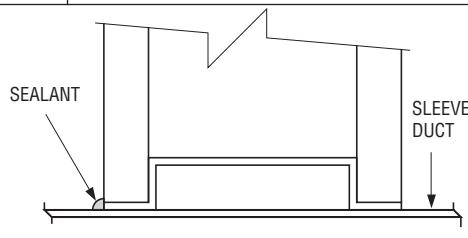
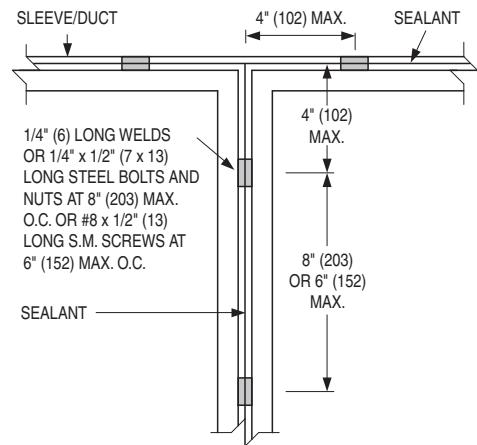

Model Series: 1210, 1260, 1280 Multi-Blade Damper

Models: 1290S or 1290S-SS Round Damper
NOTES:

- 1. Installation and Location Requirements:** Smoke dampers are required where building codes require a leakage rated damper as part of a static or dynamic smoke management system. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Bulletin NFPA 90A latest edition. Dampers are to be installed at or adjacent to the point where the duct passes through the smoke barrier unless the damper is used to isolate equipment. Dampers are designed to operate with blades running horizontally (except Model 1210VB). The damper must be installed with plane of the closed damper blades a maximum of 24" (610) from the smoke barrier and before any duct inlets or outlet.
- 2. Damper to Sleeve/Duct Attachment:** Damper shall be secured to sleeve or duct with 1/4" (6) long welds, 3/16" (5) dia. steel rivets, 1/4" (6) dia. bolts and nuts, #8 sheet metal screws, 3/16" (5) dia. buttonloks on both sides, at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. All joints between the damper and the sleeve or duct and between dampers in multiple sections, shall be sealed with Dow-Corning 732, G.E. 108 or Boss Type 310 or 315 RTV silicone sealant on one side only.
- 3. Actuators and Accessories:** Smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators may be 24, 120 or 230 VAC. Connect the incoming L1 and L2 power leads to the proper motor terminals, or, if no terminals are available, directly to the motor leads. All wiring must be in accordance with the applicable electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at a pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable. If MLS-300 position indicators are used, refer to the proper installation instructions for the MLS-300.

4. Maximum Size Limitations:

1. A rectangular damper assembly must not exceed the single section sizes and assembly sizes shown below.
2. In multiple assemblies of vertical or horizontal dampers, the frames shall be joined together on both sides of the damper using 1/4" (6) long welds, 1/4" (6) dia. bolts and nuts or #8 sheet metal screws. Center distances are as noted in the joint details (Figure 1) shown below.
3. In addition, on multiple section assemblies with extended velocity ratings, greater than 2000 fpm (10.2 m/s), #14 screws, 1/4" (6) dia. bolts and nuts, or 1/4" (6) long welds shall be used for all damper to damper joints where four damper sections adjoin and shall be located within 1" (25) of each mating corner of each damper section. Fastener/welds required on both sides of the damper assembly. (See Figure 2).

Damper Model Series	Maximum Single Section Size Dampers	Maximum Multiple Section Assembly
1210, 1280	36" x 48" (914 x 1219)	144" x 96" or 288" x 48" (3658 x 2438 or 7315 x 1219)
1260	36" x 48" (914 x 1219)	144" x 48" or 36" x 96" (3658 x 1219 or 914 x 2438)
1210M	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438), 288" x 48" (7315 x 1219)
1210BAL	36" x 48" (914 x 1219)	N/A
1210VB	48" x 36" (1219 x 914)	N/A
1290S	24" (610) dia.	N/A
1290S-SS	24" (610) dia.	N/A


DAMPER FRAME TO SLEEVE ATTACHMENT
(SEE NOTE 2)

FIGURE 1: JOINT DETAILS FOR LEG OUT FRAME

Dimensions are in inches (mm).

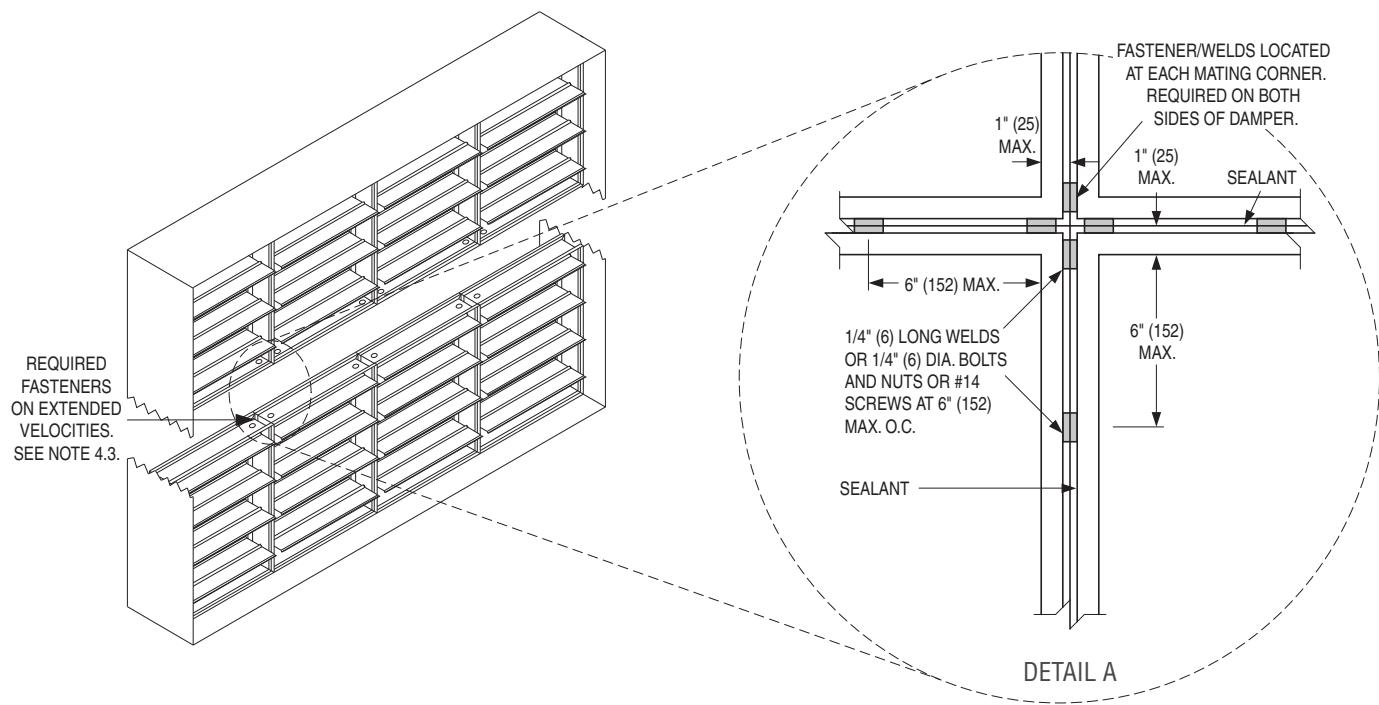
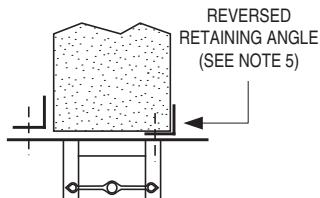


FIGURE 2: JOINT DETAILS FOR MULTIPLE SECTION ASSEMBLIES WITH EXTENDED VELOCITIES



Refer to the
UL Classification
Marking on the
Product

QUALIFICATIONS:

- Meets all the requirements of UL 555 and UL 555S.
- Meets NFPA 80, 90A, 92A, 92B, 101 and 105 as well as IBC & NBC (Canada) Building Code requirements.
- California State Fire Marshal Listing No. 03225-0935:0106.
- City of New York. MEA #366-03-M.

NOTES:

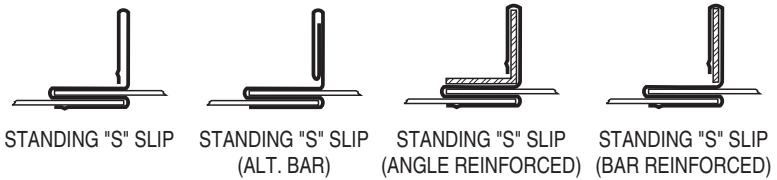
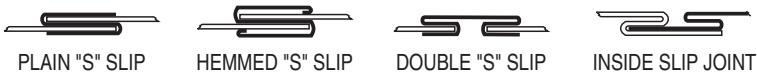
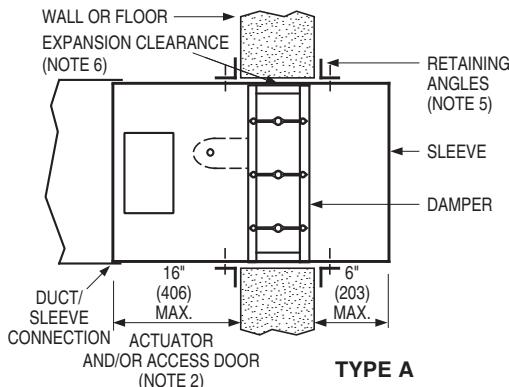
1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on a side intended for use with an actuator and/or an access door. The sleeves may extend 16" (406) on each side for use with an actuator on one side and an access door on the other side.

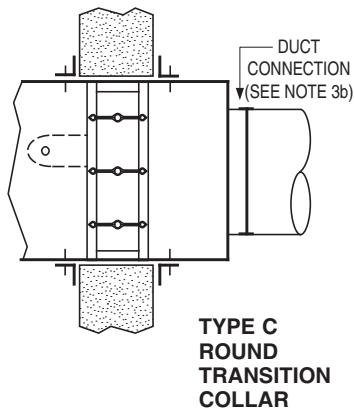
3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



- b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
- Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
- Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymerics.

- c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

4. Damper/sleeve attachment:

1. **For 1 1/2 Hour rating:** Damper shall be secured to sleeve with 1/4" (6.35) long welds, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, 3/16" (4.76) steel rivets or 3/16" (4.76) dia. buttonloks on both sides of damper at 6" (152) on center and 4" (102) maximum from all four corners of the damper.
2. **For 3 Hour rating:** Damper shall be secured to sleeve with 1/4" (6.35) long welds or 1/4" (6.35) dia. bolts and nuts on both sides of damper at 6" (152) on center and 2" (51) maximum from all four corners of the damper.
3. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper. All joints between the damper and the sleeve and between dampers in multiple sections, shall be sealed with Dow-Corning 732, G.E.108, Boss 310 or 315 RTV silicone sealant on one side only.

5. **Retaining angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) for dampers up to 90" (2286) in width and up to 90" (2286) in height. For dampers exceeding these dimensions, the angles shall be a minimum of 2" x 2" x 10 gauge (51 x 51 x 3.51).

1. **Retaining angles shall be secured to sleeve as follows:**

For 1 1/2 Hour rating: Secure the retaining angles to the sleeve with 1/4" (6.35) long welds, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws or 3/16" (4.76) dia. steel rivets at 8" (203) on center and 2" (51) maximum from all four corners of the sleeve.

2. For 3 Hour rating: Secure the retaining angles to the sleeve with 1/4" (6.35) long welds, 1/4" (6.35) dia. bolts and nuts or #10 sheet metal screws at 8" (203) on center and 2" (51) maximum from all four corners of the sleeve.

3. The retaining angles must lap the structural opening by 1" (25) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. **Expansion clearance** between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (57) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. **Maximum Size Limitations:** The maximum Type A fire damper sizes at standard velocity pressure rating of 2000 fpm @ 4 in. w.g. (10 m/s @ 1kPa), at 250°F (121°C), are as follows:

Model Series

		Single Section		Multiple Section	
1220	Vertical	(1 1/2 hr. label)	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438)	128" x 96" (3251 x 2438)
	Horizontal	(1 1/2 hr. label)	32" x 48" (813 x 1219)		
1220-3	Vertical	(3 hr. label)	36" x 48" (914 x 1219)	120" x 96" (3048 x 2438)	N/A
	Horizontal	(3 hr. label)	32" x 48" (813 x 1219)		
1220SS	Vertical	(1 1/2 hr. label)	30" x 48" (762 x 1219)	120" x 96" (3048 x 2438)	N/A
	Horizontal	N/A	N/A		
1220SS-3	Vertical	(3 hr. label)	30" x 48" (762 x 1219)	120" x 96" (3048 x 2438)	N/A
	Horizontal	N/A	N/A		
1220M	Vertical	(1 1/2 hr. label)	36" x 48" (914 x 1219)	144" x 96" (3658 x 2438)	128" x 96" (3251 x 2438)
	Horizontal	(1 1/2 hr. label)	32" x 48" (813 x 1219)		
1220M-3	Vertical	(3 hr. label)	36" x 48" (914 x 1219)	120" x 96" (3048 x 2438) (Max. Section Size not to exceed 30" x 48" [762 x 1219])	N/A
	Horizontal	(3 hr. label)	32" x 48" (813 x 1219)		
1220BAL	Vertical	(1 1/2 hr. label)	36" x 48" (914 x 1219)	N/A	N/A
	Horizontal	(1 1/2 hr. label)	32" x 48" (813 x 1219)		
1220BAL-3	Vertical	(3 hr. label)	36" x 48" (914 x 1219)	N/A	N/A
	Horizontal	(3 hr. label)	32" x 48" (813 x 1219)		

Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

8. **Actuator Connections and accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24, 120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator. Multiple section damper assemblies requiring more than one actuator must have all actuators wired to a single temperature responsive device (ERL or DTO [MLS-400]) as shown in Figure 2. This is required for simultaneous closure of all damper sections. When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

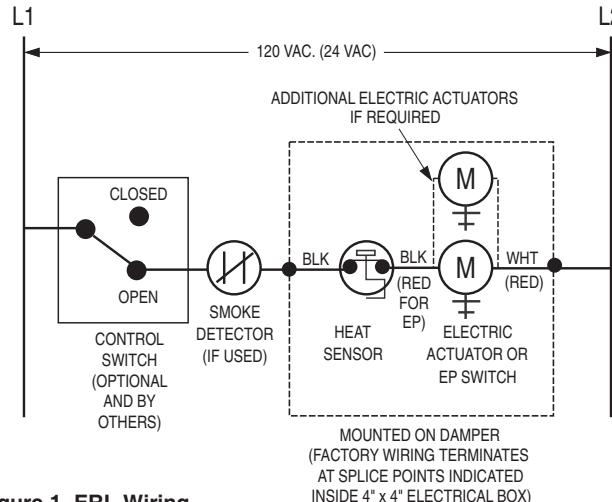


Figure 1. ERL Wiring

Dimensions are in inches (mm).

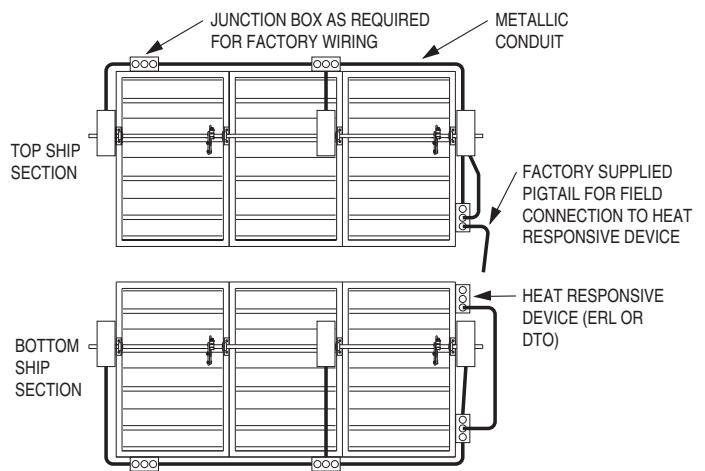


Figure 2. Typical multiple actuator damper assembly ship detail

Page 2 of 4

Dimensions are in inches (mm).

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Tel: 403-279-8619
Fax: 403-279-5035

QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER 1 1/2 hr. Label (File # R9492).
- UL 555S CLASSIFIED SMOKE DAMPER (File # R9492) Leakage Class I or II at 250°F or 350°F elevated temperature.
- City of New York. MEA #366-03-M.
- California State Fire Marshal: Fire Damper Listing No. 3225-0935:0106.
- Meets NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.
- Maximum velocity 2000 fpm @ 4" w.g. (up to 4000 fpm with size and actuator limitations. Consult Nailor).

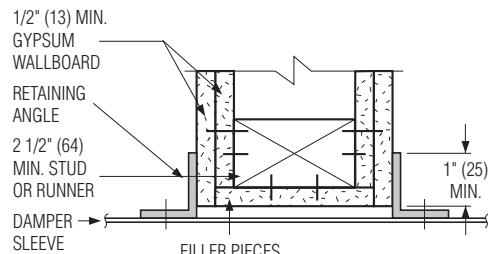


APPLICATION:

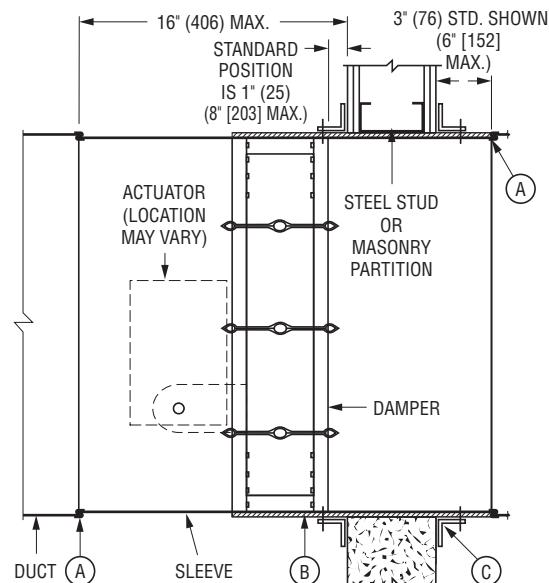
Models 1221-DOW and 1221-DOWM combination fire/smoke dampers are specially designed for "out of wall" (vertical mount) or "out of floor" (horizontal mount) through penetration applications (ductwork is connected to both sides) where the damper cannot be installed within the plane of the wall or floor.

ITEMS:

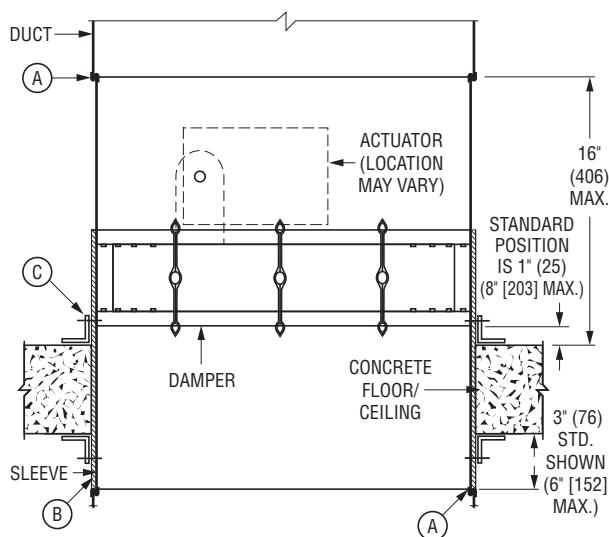
- (A) Duct/sleeve connection (See Note #4).
- (B) Intumescent material (insulation).
- (C) Retaining angles and fasteners (See Note #6).
- (D) Typical 2 Hour Rated Vertical Wood Stud Construction



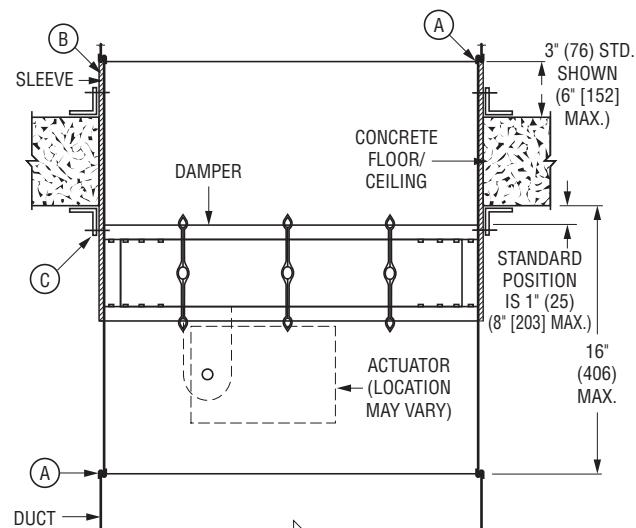
D: Wood Stud Detail



VERTICAL INSTALLATION



ABOVE FLOOR INSTALLATION

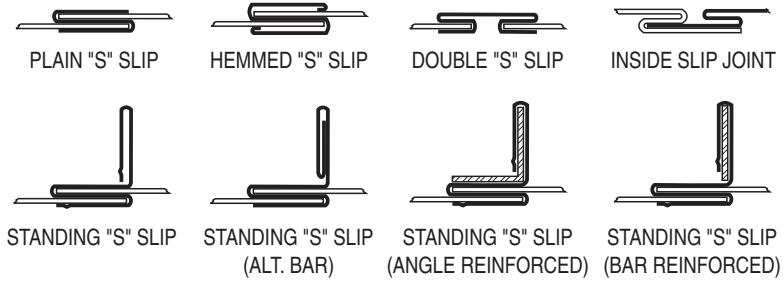


BELOW FLOOR INSTALLATION

NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Location Within Sleeve:** The maximum distance that the leading edge of the damper frame can be installed outside the wall or floor is as follows:
Steel Stud, Wood Stud or Masonry Walls: 8" (203).
Concrete Floors: 8" (203).
3. **Damper Sleeve:** Factory furnished sleeves shall not be less than 20 gauge. (1.01) coated steel.
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.
The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) from the wall/floor on the damper/actuator side and maximum 6" (152) on the other side.
4. **Break-away duct/sleeve connections:**

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 3 for rigid connections:



In addition:

- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.

- b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller may use three #10 sheet metal screws equally spaced around the circumference.
- Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
- Duct diameters larger than 36" (914) high or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

- c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

5. **Opening Size:** Expansion clearance is not required, however the opening size in partition should be sized 1/2" (13) larger than nominal damper size in all directions to allow for sleeve thickness and insulation.

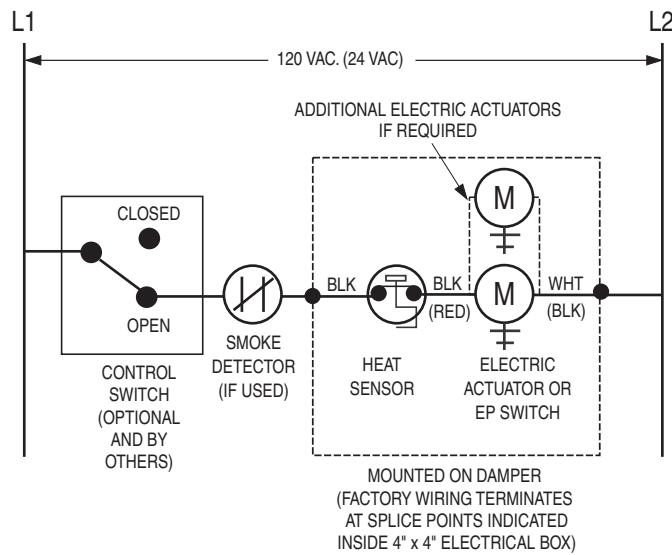
6. **Retaining Angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws, 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. Field fabricated retaining angles are not to be mechanically fastened at the corners.

7. **Maximum Size Limitations:** Vertical: 36" x 48" (914 x 1219), Horizontal: 32" x 48" (813 x 1219). Minimum size is 8" x 8" (203 x 203).

8. **Actuator Connections and accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24, 120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO (MLS-400) re-openable controls or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-MLS4 and IOM-MLS3 (H or N) respectively.



REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATE BREAKAWAY CONNECTIONS	FDFABCINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Figure 1. ERL Wiring

Dimensions are in inches (mm).

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Fax: 416-744-3360

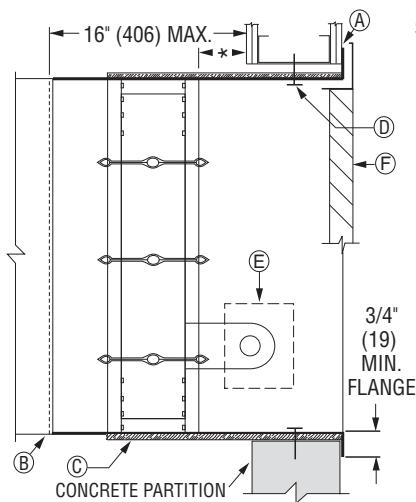
Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035



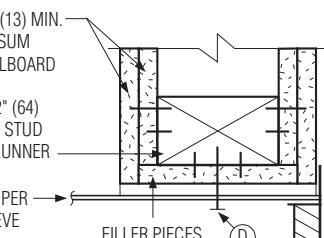
Refer to the
UL Classification
Marking on the
Product

ITEMS:

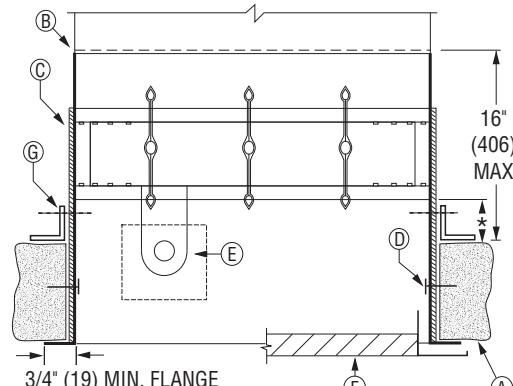
- A** Typical 2 hour rated vertical concrete or steel stud construction and horizontal concrete fire partition
- B** Duct connection (see Note #3)
- C** Intumescent material (insulation)
- D** #10 steel screws or concrete anchors (see Note #5)
- E** Actuator
- F** Grille/Diffuser
- G** Rear retaining angle (see Note #5)
- H** ERL Electric Resettable Link (Heat Sensor)
- I** Typical 2 Hour Rated Vertical Wood Stud Construction



VERTICAL MOUNT



I: Wood Stud Detail



HORIZONTAL MOUNT

QUALIFICATIONS:

- Meets all the requirements of UL 555 and UL 555S.
- Meets the requirements for NFPA 80, 90A, 92, 101 and 105 as well as IBC and NBC (Canada) building codes.
- California State Fire Marshal Listing No. 3225-0935:0106.
- City of New York. MEA #336-03-M.

NOTES:

IMPORTANT: DAMPER IS FURNISHED FULL-SIZE (See Note #4)

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

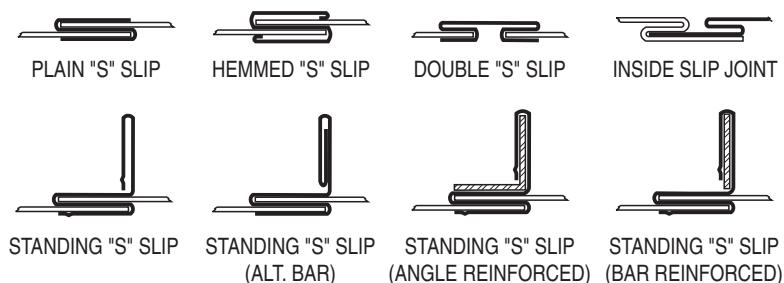
2. Damper Sleeve: Factory furnished sleeves shall not be less than 20 gauge. (1.01) coated steel.

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) from the wall.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.



FLAT DRIVE SLIP

Dimensions are in inches (mm).

- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.
- b.** Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:
 - Duct diameters 22" (559) and smaller may use three #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters larger than 36" (914) high or diameter may use eight #10 sheet metal screws equally spaced around the circumference.
- c.** For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

4. Opening Size: Dampers are furnished full ordered size to facilitate grille installation. Opening size in partition should be sized 1/2" (13) larger in all directions to allow for sleeve thickness and insulation.

5. Fasteners and Retaining Angles. For installation in a masonry wall or floor/ceiling and metal stud drywall partitions, no rear retaining angles are required. Insert damper/sleeve combination into opening so that the 3/4" (19) flange is tight to the drywall or concrete. Secure the damper in the wall opening from inside the sleeve as shown above by use of the following:

- In metal stud/drywall walls, partitions and cavity shaft wall partitions, use minimum #10 sheet metal screws.
- In masonry walls or floor/ceilings use minimum #10 self-tapping concrete anchors. Anchors must penetrate wall minimum 1 1/2" (38).
- In wood stud, use minimum #10 steel screws, 2 1/2" (64) long with minimum 1 1/2" (38) penetration into framing.

Fasteners shall be spaced a maximum of 6" (152) on center and 2" (51) maximum from corners, a minimum of two per side is required.

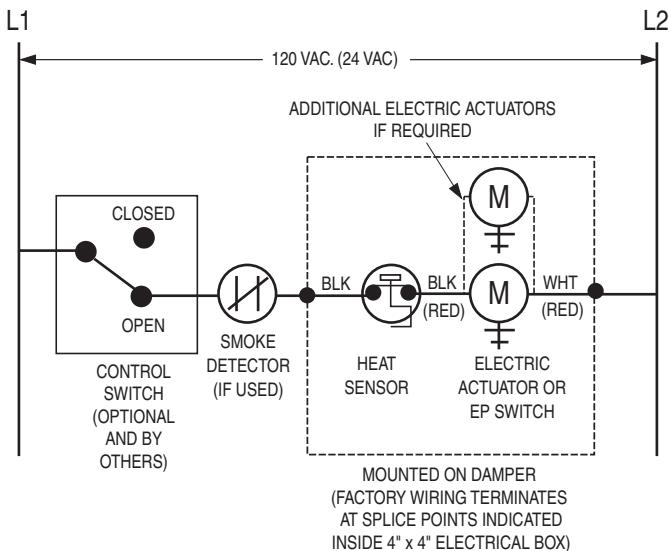
Alternatively, 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) rear retaining angles may be used in lieu of the above prescribed method and secured to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws, 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides.

6. Maximum Size Limitations: Vertical: 36" x 48" (914 x 1219), Horizontal: 32" x 48" (813 x 1219). Minimum size is 12" x 8" (305 x 203).

7. Actuator Connections and accessories: Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24,120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO (MLS-400) re-openable controls or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-MLS4 and IOM-MLS3 (H or N) respectively.



REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATIVE BREAKAWAY CONNECTIONS	FDFABC
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Figure 1. ERL Wiring

Dimensions are in inches (mm).

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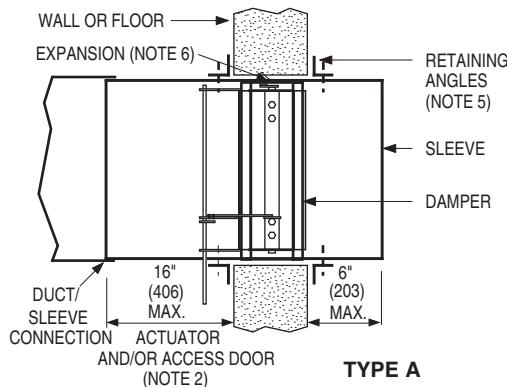
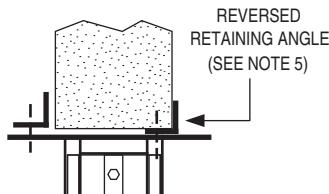


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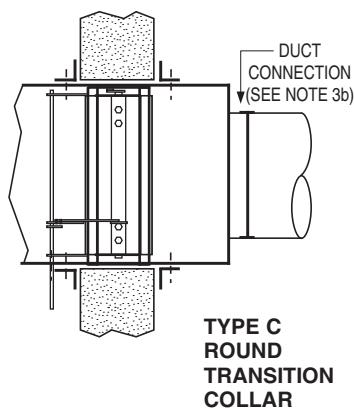
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Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035



TYPE A



QUALIFICATIONS:

- Meets all the requirements of UL 555 and UL 555S.
- Meets the requirements for NFPA 90A, NFPA 92A, BOCA, SBCCI, UBC, IBC and associated local building codes.
- California State Fire Marshal Listing No. 03225-0935-106.
- City of New York. MEA #336-03-M.

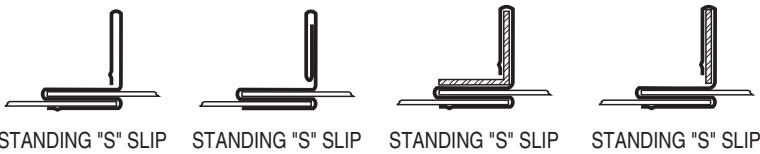


Refer to the
UL Classification
Marking on the
Product

NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel. The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on a side intended for use with an actuator and/or an access door. The sleeves may extend 16" (406) on each side for use with an actuator on one side and an access door on the other side.
3. **Break-away duct/sleeve connections:**

a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections:



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
- Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
- Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymerics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

4. **Damper/sleeve attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonloks on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper. All joints between the damper and the sleeve and between dampers in multiple sections, shall be sealed with Dow-Corning 732, G.E.108, Boss 310 or 315 RTV silicone sealant on one side only.

5. **Retaining angles:** other than factory supplied Nailor 'Quick-Set' angles, shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) for dampers up to 90" (2286) in width and up to 90" (2286) in height. For dampers exceeding these dimensions, the angles shall be a minimum of 2" x 2" x 10 gauge (51 x 51 x 3.51). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. **Expansion clearance** between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. **Maximum Size Limitations:** The maximum Type A fire damper size is as follows:
Model 1220-VB Vertical mount only: 48" x 36" (1219 x 914).
Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

8. **Actuator Connections and accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24, 120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

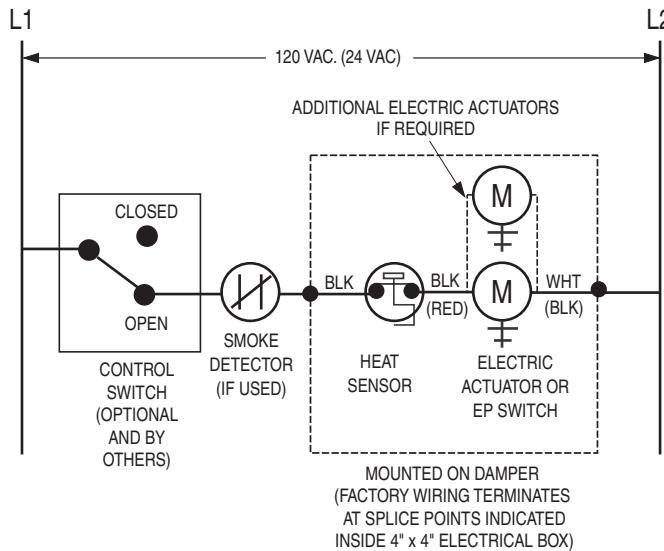


Figure 1. ERL Wiring

IMPORTANT:
DO NOT CAST DAMPER IN PLACE.
DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.
DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.
VERTICAL MOUNTING SHOWN ON MASONRY WALL.
FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
SINGLE SIDED RETAINING ANGLES	FDSSRAINST
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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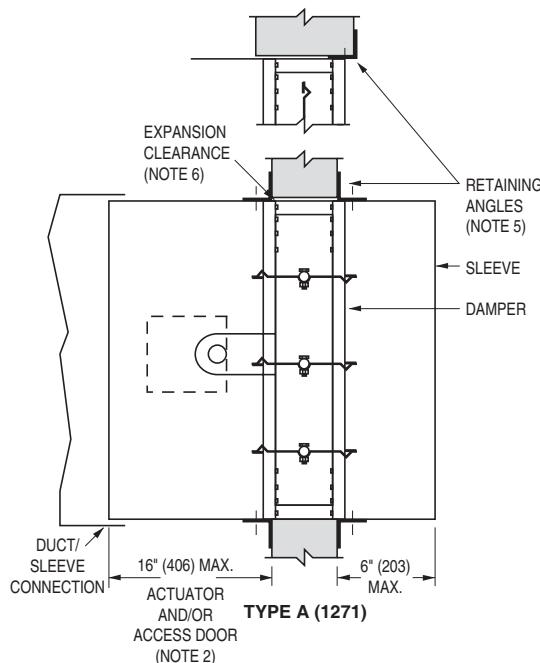


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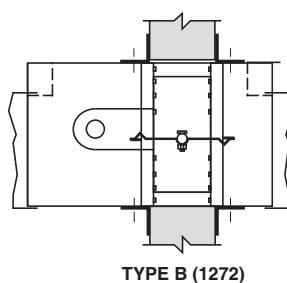
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Tel: 702-648-5400
Fax: 702-638-0400

Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

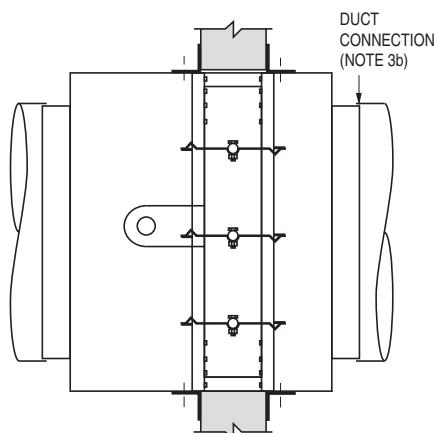
Calgary, Canada
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Fax: 403-279-5035



TYPE A (1271)



TYPE B (1272)



TYPE C ROUND, OVAL, OR RECTANGULAR
TRANSITION COLLAR (1273)

QUALIFICATIONS:

- Meets all the requirements of UL 555 and UL 555S.
- Meets the requirements for NFPA 80, 90A, 92A, 92B, 101 and 105 as well as IBC and NBC (Canada) Building Codes.
- California State Fire Marshal Listing No. 03225-0935:106 and 03230-0935:107.
- City of New York BSA #460-88-SA.



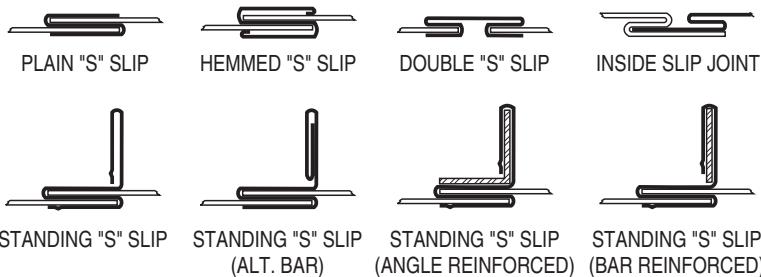
Refer to the
UL Classification
Marking on the
Product

NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves up to 36" wide by 24" (914 x 610) high of not less than 16 gauge (1.61) coated steel, or larger sleeves of not less than 14 gauge (1.99) thick coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel. The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on one side when incorporating a factory installed access door. The sleeves may extend 16" on each side for use with an actuator on one side and an access door on the other side.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in note 2 for rigid connections.



In addition:

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

- a. Round and oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:
 - Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference.
 - Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

4. **Damper/sleeve attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonloks on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper. All joints between the damper and the sleeve and between dampers in multiple sections, shall be sealed with Dow-Corning 732 or G.E. RTV108 silicone sealant on one side only.

5. **Retaining angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) for dampers up to 90" (2286) in width and up to 90" (2286) in height. For dampers exceeding these dimensions, the angles shall be a minimum of 2" x 2" x 10 gauge (51 x 51 x 3.51). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the wall or floor, the retaining angles may be turned inwards, providing the opening size is increased by an amount equal to twice the combined thickness of the angle and the height of the screw or bolthead to maintain the required expansion clearance. Field fabricated retaining angles are not to be mechanically fastened at the corners.

6. **Expansion clearance** between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 2" (50.8) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 36" x 36" (914 x 914) shall have an opening size of 36 3/8" x 36 3/8" (924 x 924) minimum and 38 3/8" x 38 3/8" (975 x 975) maximum.

7. **Maximum Size Limitations:** The maximum Type A fire damper sizes are as follows:

Model Series

1270 Vertical (1 1/2 hr. label)
 Horizontal (1 1/2 hr. label)

Single Section

36" x 48" (914 x 1219)
30" x 40" (762 x 1016)

Multiple Section Assembly

72" x 48" or 36" x 96" (1829 x 1219 or 914 x 2438)
60" x 40" or 30" x 80" (1524 x 1016 or 762 x 2032)

Type B and C dampers have the same overall damper size but the connecting ducts are smaller due to the B or C enclosures. See Type B and Type C specification drawings for maximum duct sizes.

In cases when the openings are larger than specified above, a UL tested and qualified steel mullion must be provided between assemblies (Refer to supplementary installation document FDSMINST).

8. **Actuators Connections and Accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24, 120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

Multiple section damper assemblies requiring more than one actuator must have all actuators wired to a single or dual temperature responsive device (ERL or DTO) as shown in Figure 2. This is required for simultaneous closure of all damper sections. When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

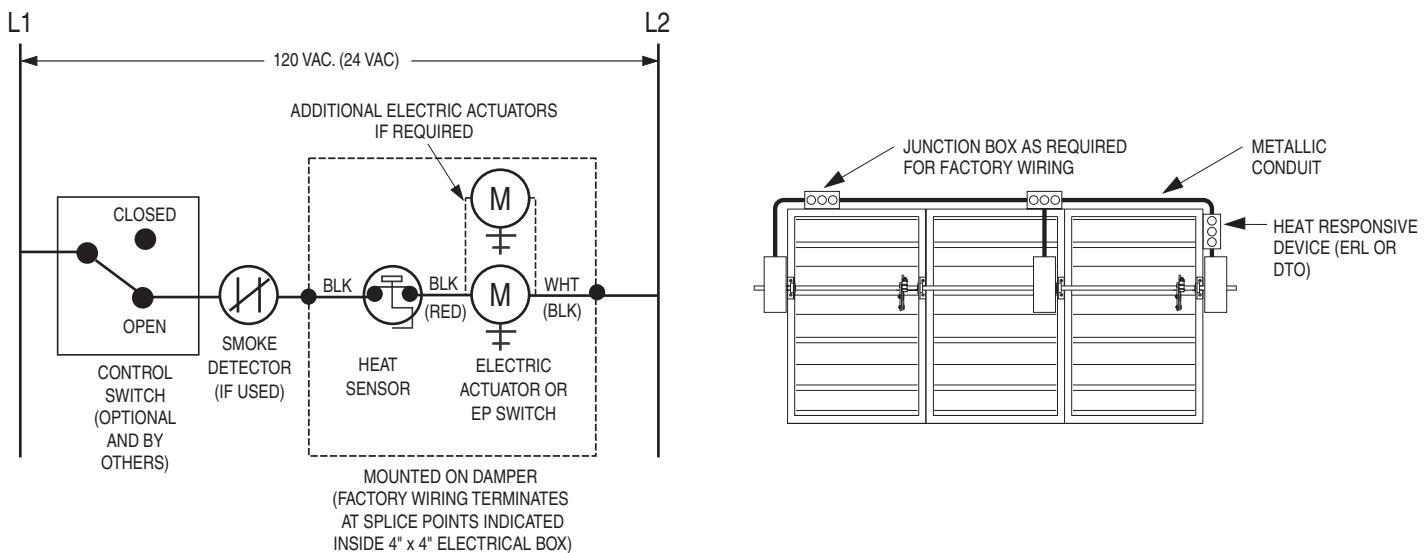


Figure 1. ERL Wiring

Figure 2. Typical multiple actuator damper assembly ship detail

Dimensions are in inches (mm).

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9. Multiple-section assemblies: In multiple assemblies of vertical or horizontal dampers, the frames shall be joined together on both sides of the damper using 1/4" (6) long welds, 1/4" (6.35) dia. bolts and nuts, or #8 sheet metal screws. Center distances as noted on joint details in Figure 4.

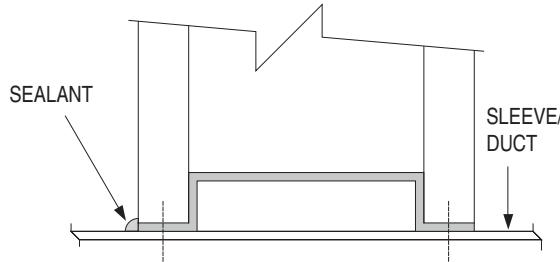


Figure 3. Damper frame to sleeve attachment (See note 4)

IMPORTANT:

DO NOT CAST DAMPER IN PLACE.
 DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.
 DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.
 VERTICAL MOUNTING SHOWN ON MASONRY WALL.
 FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.
 HORIZONTAL MOUNTING SIMILAR FOR MASONRY WALL.

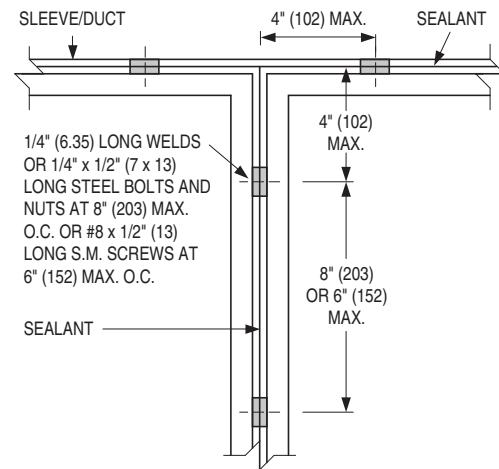


Figure 4. Multiple section assembly joint detail

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
STEEL MULLIONS (for dampers in oversized wall openings)	FDSMINST
SINGLE SIDED RETAINING ANGLES	FDSSRAINST
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCCINST
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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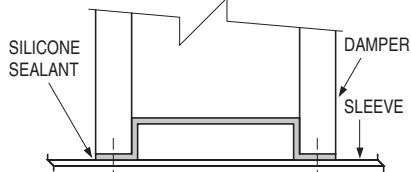
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Fax: 702-638-0400

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Tel: 416-744-3300
Fax: 416-744-3360

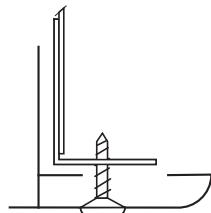
Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035



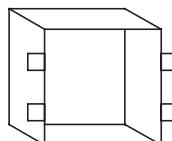
Refer to the
UL Classification
Marking on the
Product



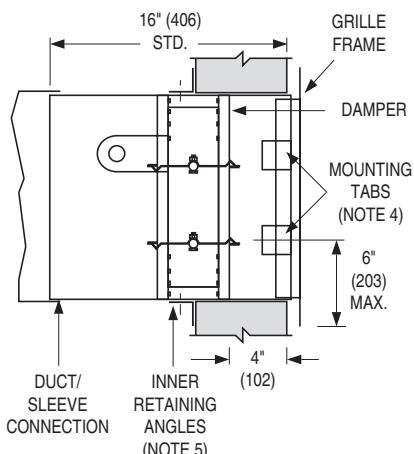
**DAMPER FRAME/SLEEVE ATTACHMENT
(NOTE 4)**



**STEEL GRILLE FRAME
(Minimum .019" Material)**



**ISOMETRIC OF
TYPICAL SLEEVE/
MOUNTING TABS
(NOTE 5)**



QUALIFICATIONS:

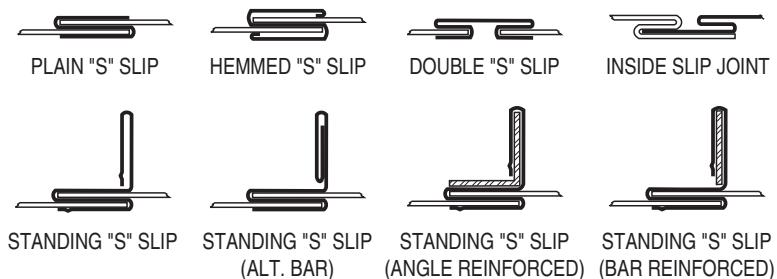
- Meets all the requirements of UL 555 and UL 555S.
- Meets NFPA 80, 90A, 92A, 92B, 101 and 105 as well as IBC and NBC (Canada) Building Code requirements.
- California State Fire Marshal Listing No. 3225-0935:0106.
- City of New York BSA #460-88-SA (Series 1270).
- City of New York MEA #366-03-M (Series 1220).

NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves of not less than 16 gauge (1.61) coated steel, may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel. The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) on the side intended for use with an actuator.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in Note 2 for rigid connections. In addition:



- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.
- b. Round and oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:



- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

4. **Damper/sleeve attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonloks on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper. All joints between the damper and the sleeve shall be sealed with Dow-Corning 732 or G.E. RTV108 silicone sealant on one side only.

5. **Inner Retaining angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. Where the sleeve terminates at the wall, 2" (51) wide mounting angle tabs with a 3/4" (19) flange are fastened to the sleeve. Mounting tabs may be installed on top and bottom, or sides, or a combination of both. A steel grille frame with a minimum 1" (25) flange is then fastened to the mounting angle tabs with sheet metal screws.

6. **Expansion clearance** between the sleeve and the wall opening shall be a minimum of 1/8" per foot (3.18 per 305) of the sleeve in either dimension. The maximum size of the opening shall be 1/8"(3.18) larger in each dimension than the allowable minimum size. For example, a sleeve dimension of 24" x 24" (610 x 610) shall have an opening size of 24 1/4" x 24 1/4" (610 x 610) minimum and 24 3/8" x 24 3/8" (619 x 619) maximum.

7. **Maximum Damper Size:** 24" x 24" (610 x 610). Minimum size is 8" x 8" (203 x 203). 8" x 6" (203 x 152) for Model 1221G only (maximum width is 18" [457] when height is 6" [152]).

8. **Actuators Connections and Accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24,120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

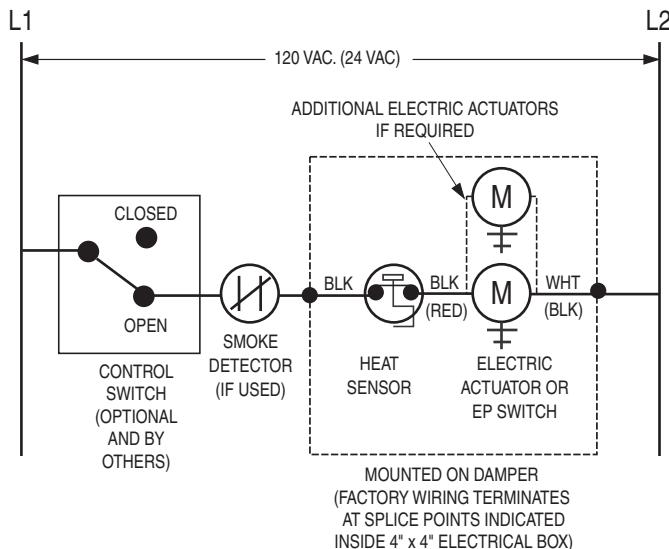


Figure 1. ERL Wiring

IMPORTANT:

DO NOT CAST DAMPER IN PLACE.
 DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO WALL OR FLOOR.
 DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.
 VERTICAL MOUNTING SHOWN ON MASONRY WALL.
 FOR INSTALLATION IN DRYWALL FRAMING, SEE DOC. FDSWSFINST.
 HORIZONTAL MOUNTING SIMILAR FOR MASONRY WALL.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST
FLANGED TYPE ALTERNATE BREAKAWAY CONNECTIONS	FDFABCINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

Dimensions are in inches (mm).

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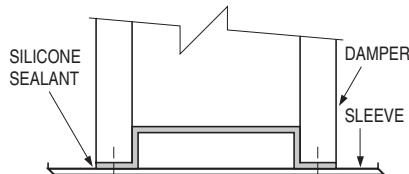
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 Fax: 702-638-0400

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 Fax: 416-744-3360

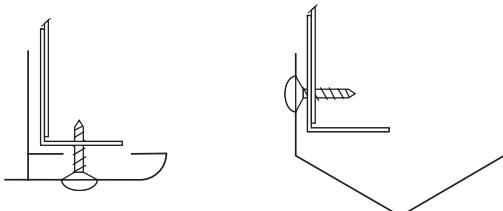
Calgary, Canada
 Tel: 403-279-8619
 Fax: 403-279-5035



Refer to the UL or
ULC Classification
Marking on the
Product



DAMPER FRAME/SLEEVE ATTACHMENT (NOTE 4)



STEEL GRILLE FRAME

STEEL DIFFUSER FRAME

Minimum .019" (0.48) material thickness

QUALIFICATIONS:

- Meets all the requirements of UL 555 and UL 555S.
- Meets the requirements for NFPA 90A, NFPA 92A
- Meets the requirements of City of Los Angeles, Uniform Building Code.
- California State Fire Marshal Listing No. 3225-0935:106.

CEILING FRAMING NOTES:

1. If wood studs are used, fasten filler pieces on 12" (305) max. centers in opening. If metal studs are used, filler pieces are optional.
2. The thickness of the gypsum board and the size of the drywall studs are dictated by the fire-rated ceiling design.

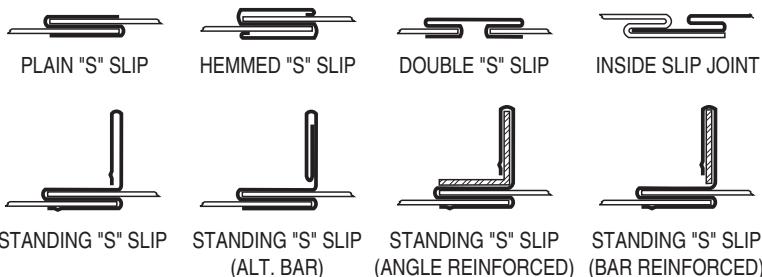
NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.
2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves of not less than 16 gauge (1.61) coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) on the side intended for use with an actuator.

3. Break-away duct/sleeve connections:

- a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in Note 2 for rigid connections:
In addition:



Dimensions are in inches (mm).

Page 1 of 2

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant Adhesive as manufactured by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

4 **Damper/sleeve attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonloks on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper. All joints between the damper and the sleeve shall be sealed with Dow-Corning 732, G.E.108, Boss 310 or 315 RTV silicone sealant on one side only.

5. **Upper Retaining angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the ceiling, 2" (51) wide mounting tabs are fastened to the sleeve in two places on each of two opposite sides of the sleeve. These tabs are bent over after installing damper through ceiling opening. A steel grille or diffuser frame with a minimum 1" (25.4) flange is then fastened to the mounting angle tabs with sheet metal screws.

6. **Expansion clearance** between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 1/8" (3.18) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 24" x 24" (610 x 610) shall have an opening size of 24 1/4" x 24 1/4" (616 x 616) minimum and 24 3/8" x 24 3/8" (619 x 619) maximum.

7. **Maximum Damper Size:** 24" x 24". Minimum size is 8" x 8" (203 x 203).

8. **Actuator Connections and accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24,120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

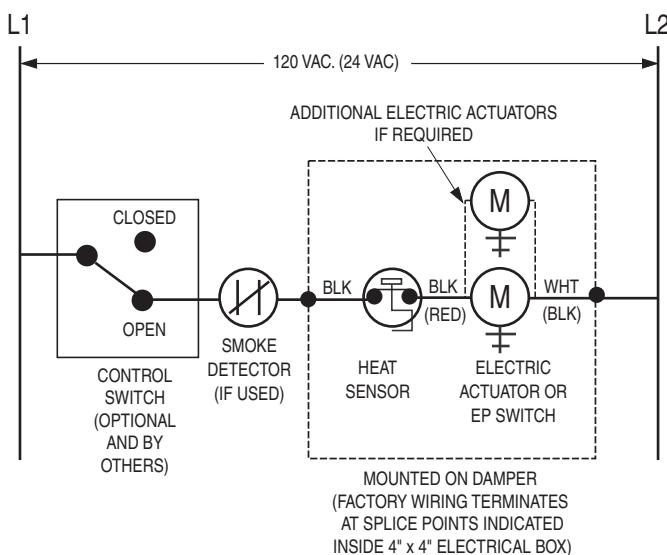


Figure 1. ERL Wiring

Dimensions are in inches (mm).

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IMPORTANT:

DO NOT CAST DAMPER IN PLACE.
DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO CEILING.
DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.
DO CYCLE DAMPER AFTER INSTALLATION TO ASSURE PROPER OPERATION.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

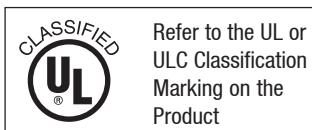


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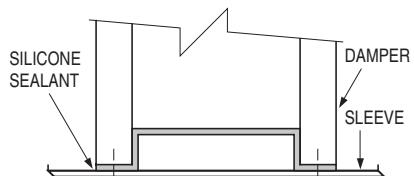
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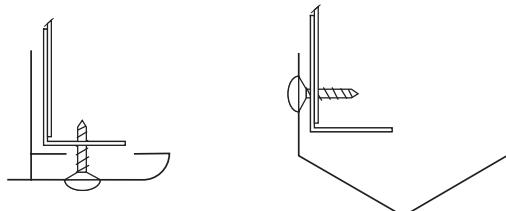
Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035



Refer to the UL or
ULC Classification
Marking on the
Product

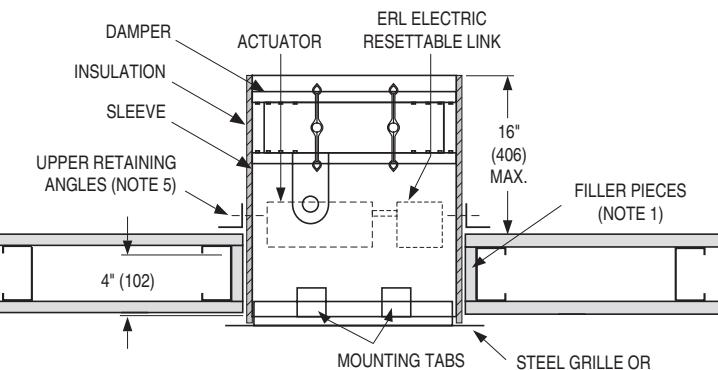


DAMPER FRAME/SLEEVE ATTACHMENT (NOTE 4)

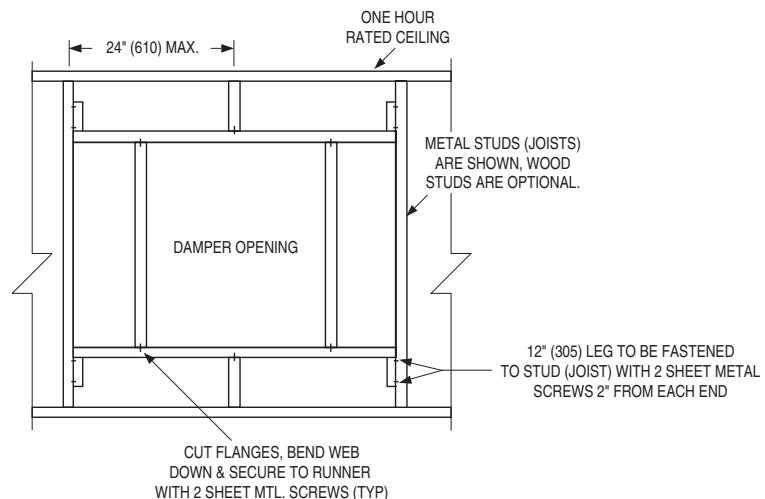


STEEL GRILLE FRAME

Minimum .019" (0.48) material thickness



MOUNTING TABS ARE BENT AFTER INSTALLING THROUGH OPENING.



CEILING FRAMING DETAIL

CEILING FRAMING NOTES:

1. If wood studs are used, fasten filler pieces on 12" (305) max. centers in opening. If metal studs are used, filler pieces are optional.

2. The thickness of the gypsum board and the size of the drywall studs are dictated by the fire-rated ceiling design.

NOTES:

1. Installation shall be in accordance with the appropriate requirements of the National Fire Protection Association Standard NFPA 90A latest edition.

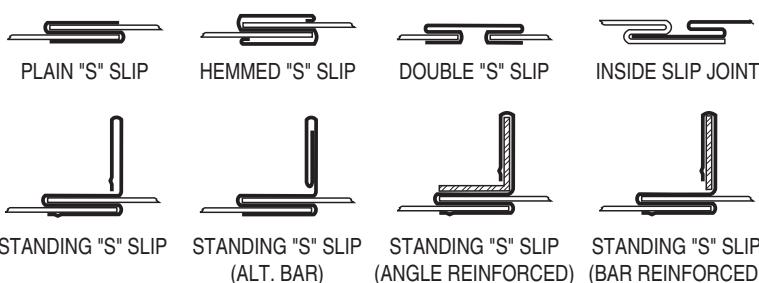
2. **Damper Sleeve:** Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a break-away style duct/sleeve connection is not used, damper sleeves of not less than 16 gauge (1.61) coated steel may be attached to the duct with screws or other types of mechanical fasteners. The maximum sleeve thickness for such rigid joints is 10 gauge (3.51) for coated steel.

The connecting duct shall not be continuous thru the wall or floor opening but shall terminate at the sleeve. Sleeves shall extend a maximum of 16" (406) on the side intended for use with an actuator.

3. **Break-away duct/sleeve connections:**

a. Rectangular ducts must use one or more of the following connections if the gauge is less than the requirement in Note 2 for rigid connections:

In addition:



Dimensions are in inches (mm).

Page 1 of 2

- A maximum of two #10 sheet metal screws on each side and on the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used.
- One of the above connections on the top and bottom joints with flat drive slip connections on the side joints may be used for dampers up to 20" (508) in height.



FLAT DRIVE SLIP

b. Round or oval duct may be attached to the round or oval collar which is part of the damper/sleeve in the following manner:

- Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference.

Note: When optional sealing of these break-away connections is desired, the duct sealant shall be PA2084T Duct Sealant Adhesive as manufactured by Precision or water based DP1010 by Design Polymetrics.

c. For the use of approved alternative Ductmate or TDC/TDF break-away connections, refer to the supplements noted on this page.

4 **Damper/sleeve attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (4.76) steel rivets, 1/4" (6.35) dia. bolts and nuts, #8 sheet metal screws, or 3/16" (4.76) dia. buttonloks on both sides at 6" (152) on center and a maximum of 4" (102) from the corners of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper. All joints between the damper and the sleeve shall be sealed with Dow-Corning 732, G.E.108, Boss 310 or 315 RTV silicone sealant on one side only.

5. **Upper Retaining angles** shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61). Secure the retaining angles to the sleeve with 1/2" (12.7) long welds, 1/4" (6.35) dia. bolts and nuts, 3/16" (4.76) dia. steel rivets or #8 sheet metal screws 8" (203) on center and 2" (51) maximum from corner of sleeve on all four sides. The retaining angles must lap the structural opening by 1" (25.4) minimum. When the ductwork terminates at the ceiling, 2" (51) wide mounting tabs are fastened to the sleeve in two places on each of two opposite sides of the sleeve. These tabs are bent over after installing damper through ceiling opening. A steel grille or diffuser frame with a minimum 1" (25.4) flange is then fastened to the mounting angle tabs with sheet metal screws.

6. **Expansion clearance** between the sleeve and wall or floor shall be a minimum of 1/8" per foot (3.18 per 305) of width or height of the sleeve. The maximum size of the opening shall be 1/8" (3.18) larger in either dimension than the allowable minimum size. For example; a sleeve dimension of 24" x 24" (610 x 610) shall have an opening size of 24 1/4" x 24 1/4" (616 x 616) minimum and 24 3/8" x 24 3/8" (619 x 619) maximum.

7. **Maximum Damper Size:** 24" x 24". Minimum size is 8" x 8" (203 x 203).

8. **Actuator Connections and accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24,120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 1 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

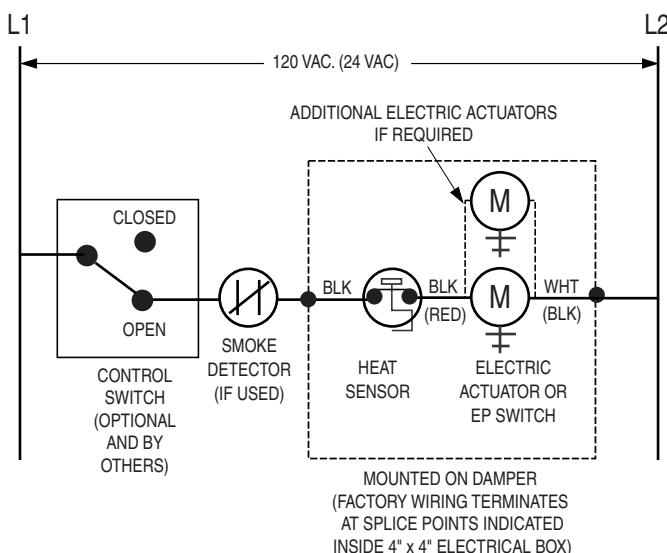


Figure 1. ERL Wiring

Dimensions are in inches (mm).

Page 2 of 2

IMPORTANT:

DO NOT CAST DAMPER IN PLACE.
DO NOT FASTEN RETAINING ANGLES OR DAMPER DIRECTLY TO CEILING.
DO NOT INSTALL DAMPER OUT OF SQUARE OR OUT OF FLAT.
DO CYCLE DAMPER AFTER INSTALLATION TO ASSURE PROPER OPERATION.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL REQUIREMENTS:

MLS-300 (Honeywell) POSITION INDICATOR	MLS3H
MLS-300 (Nailor) POSITION INDICATOR	MLS3N
DTO DUAL TEMPERATURE OVERRIDE SENSOR (MLS-400)	DTO
ERL ELECTRIC RESETTABLE LINK	ERL
DUCTMATE BREAKAWAY CONNECTIONS	FDDMINST
TDC/TDF FLANGED DUCT CONNECTION	FDTDCFINST
QUICK-SET RETAINING ANGLES	FDQSRA

QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER 1 1/2 hr. Label (File #'s R9492 & R19569).
- Meets NFPA 80, 90A and 101 as well as IBC & NBC (Canada) Building Code requirements.
- California State Fire Marshal Listing No. 03225-0935:101.
- City of New York, MEA# 336-03-M.
- These dampers are qualified for installation in 1 hr. and 2 hr. rated masonry walls or floors and 1 hr. and 2 hr. rated metal or wood stud drywall partitions.

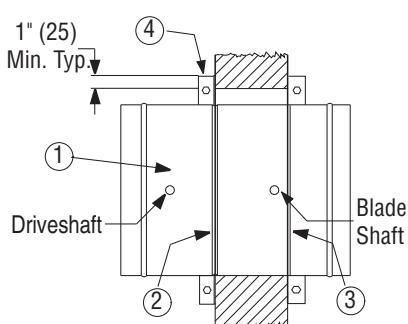


Figure 1. Masonry Wall or Floor

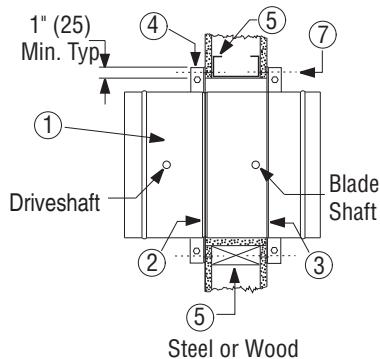


Figure 2. Drywall Partition

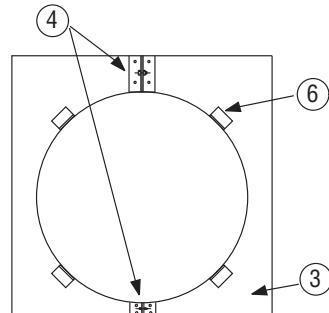
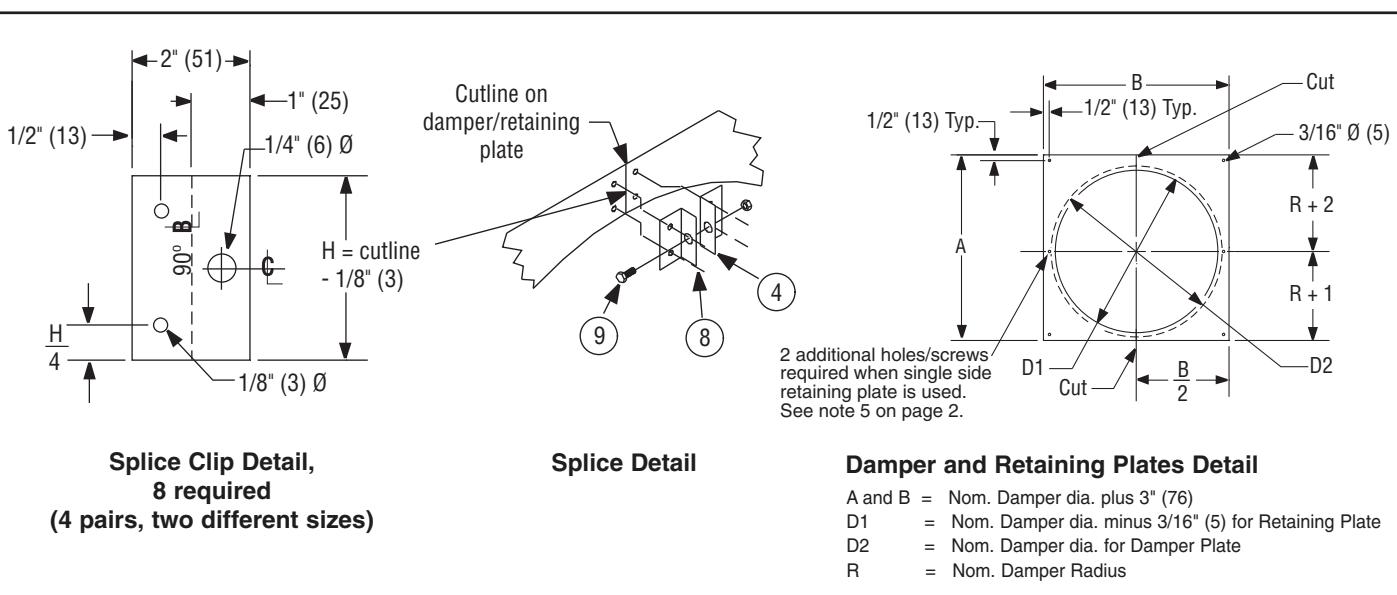


Figure 3. Damper Plate



ITEMS:

1. Model 1290F or 1290F-SS fire damper.
2. Retaining Plate, 20 gauge (1.0) galvanized steel (1290F) or stainless steel (1290F-SS).
3. Damper Plate, 20 gauge (1.0) galvanized steel (1290F) or stainless steel (1290F-SS).
4. Splice clips, 20 gauge (1.0) galvanized steel (1290F) or stainless steel (1290F-SS), two pairs for each plate.
5. Steel or wood runner.
6. Retaining clip - 1" x 1" x 1" (25 x 25 x 25) 20 gauge (1.0) galvanized steel (1290F) or stainless steel (1290F-SS) angle (see note 5).
7. #10 sheet metal screw
8. 1/8" (3) dia. steel pop rivet, or #10 x 1/2" (13) sheet metal screws, or tack or spot welds.
9. 1/4" (6) dia. x 1" (25) long nut and bolt for securing splice clip halves together.

**For Metal and Wood Stud Framing in
Drywall Partitions instructions;
See doc. FDSWSFINST**

GENERAL INSTALLATION:

1. Installation shall be in accordance with NFPA 90A, latest edition. Connecting duct gauge shall be 20 gauge (1.0) maximum (standard integral damper sleeve) and in accordance with SMACNA Duct Construction Standards. (Exception, see Note 7).
2. The square (drywall/masonry) or round (masonry) wall opening shall be 1" (25) larger than the overall size of the damper diameter.
3. If not supplied, fabricate retaining plate and damper plate using dimensions shown in details.
4. Install retaining plate in groove on actuator side of damper using 1/4" (6) dia. nut and bolt through splice clip. Install damper within wall opening as shown in Figure 1 or 2. Install damper plate and clamp using 1/4" (6) dia. nut and bolt through splice clip. Both retaining and damper plates should be tight to the wall.
5. On drywall installations screw the retaining and damper plates to the wall through the 3/16" (5) dia. holes in the corners of the plates. Major diameter or body of screws must engage metal or wood studs or runners. On masonry installations, the damper plate shown in Fig. 3 should be used. This has four equally spaced clips 1" x 1" x 1" (25 x 25 x 25) 20 gauge (1.0) which are attached to the plate and damper sleeve using 3/16" (5) rivets, tack or spotwelds. (Make sure that fasteners do not interfere with the operation of the damper blade). For dampers 12" (305) dia. or less, single side retaining plate may be used (damper plate optional) but retaining plate must be fastened to wall or floor with 6 screws instead of 4.
6. The connecting duct shall not be continuous through the wall or floor but shall terminate at each end of the damper sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on one side intended for use with an actuator or an access door. The sleeve may extend a maximum of 16" (406) on each side when access door and actuator are on opposite sides.
7. Connecting ducts shall be attached using three equally spaced #10 sheet metal screws or a 4" (102) wide draw band spanning the joint. Duct sealant may be used. If damper frame/sleeve and connecting duct are 16 gauge (1.61), a rigid duct connection may be used.
8. **Maximum Damper Size:** 24" (610) dia. Minimum size is 6" (152) dia.

REFER TO THE APPROPRIATE NAILOR INSTALLATION INSTRUCTION SUPPLEMENTS FOR ADDITIONAL INFORMATION OR SPECIAL

REQUIREMENTS:

MLS-300 (Nailor) POSITION INDICATOR	MLS3N
STEEL AND WOOD STUD FRAMING	FDSWSFINST
CAVITY SHAFT WALL PARTITIONS	FDCSWINST

Dimensions are in inches (mm).

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Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

QUALIFICATIONS:

- UL 555 & CAN/ULC-S112 CLASSIFIED FIRE DAMPER 1 1/2 hr. Label (File #'s R9492 & R19569).
- Meets NFPA 80, 90A, 92A, 92B, 101 and 105 as well as IBC & NBC (Canada) Building Code requirements.
- California State Fire Marshall Listing No. 3225-0935:106.
- City of New York. MEA# 336-03-M.
- These dampers are qualified for installation in 1 hr. and 2 hr. rated masonry walls or floors and 1 hr. and 2 hr. rated metal or wood stud drywall partitions.

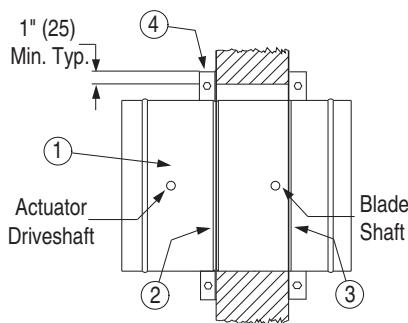


Figure 1. Masonry Wall or Floor

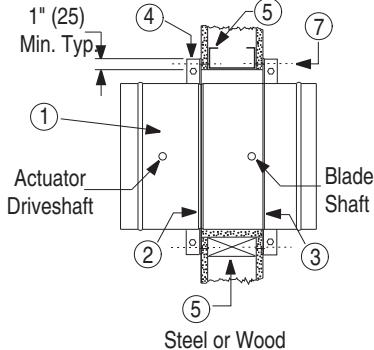


Figure 2. Drywall Partition

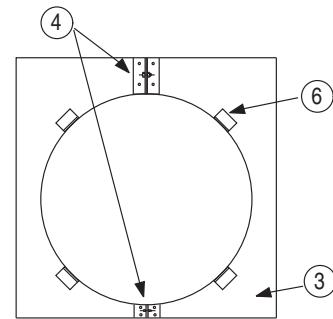
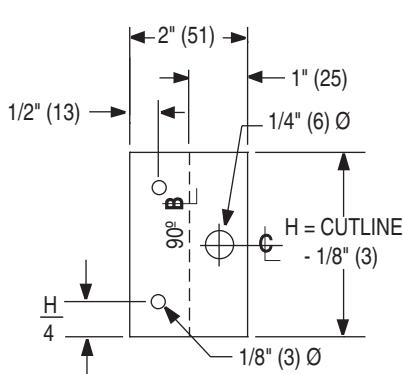
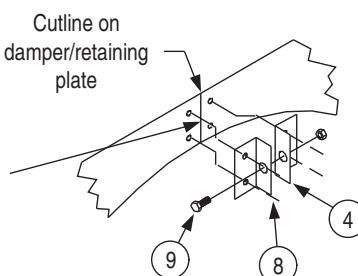


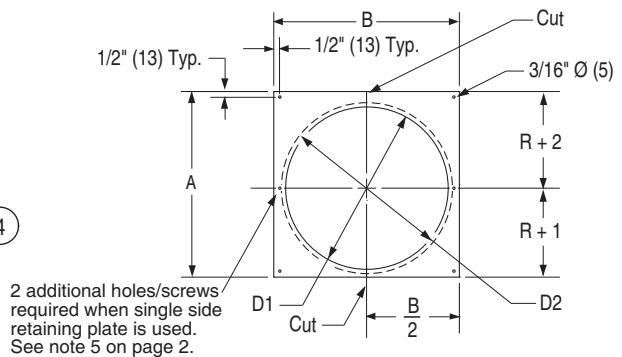
Figure 3. Damper Plate



Splice Clip Detail,
8 required
(4 pairs, two different sizes)



Splice Detail



Damper and Retaining Plates Detail

A and B = Nom. Damper dia. plus 3" (76)
 D1 = Nom. Damper dia. minus 3/16" (5) for Retaining Plate
 D2 = Nom. Damper dia. for Damper Plate
 R = Nom. Damper Radius

ITEMS:

1. Model 1290FS or 1290FS-SS damper.
2. Retaining Plate, 20 gauge (1.0) galvanized steel (1290FS) or stainless steel (1290FS-SS).
3. Damper Plate, 20 gauge (1.0) galvanized steel (1290FS) or stainless steel (1290FS-SS).
4. Splice clips, 20 gauge (1.0) galvanized steel (1290FS) or stainless steel (1290FS-SS), two pairs for each plate.
5. Steel or wood runner.
6. Retaining clip - 1" x 1" x 1" (25 x 25 x 25) 20 gauge (1.0) galvanized steel (1290FS) or stainless steel (1290FS-SS) angle (see note 5).
7. #10 sheet metal screw
8. 1/8" (3) dia. steel pop rivet, or #10 x 1/2" (13) sheet metal screws, or tack or spot welds.
9. 1/4" (6) dia. x 1" (25) long nut and bolt for securing splice clip halves together.

For Metal and Wood Stud Framing in Drywall Partitions instructions;
See doc. FDSWSFINST

GENERAL INSTALLATION:

1. Installation shall be in accordance with NFPA 90A, latest edition. Connecting duct gauge shall be 20 gauge (1.0) maximum (standard integral damper sleeve) and in accordance with SMACNA Duct Construction Standards. (Exception, see Note 7).
2. The square (drywall/masonry) or round (masonry) wall opening shall be 1" (25) larger than the overall size of the damper diameter.
3. If not supplied, fabricate retaining plate and damper plate using dimensions shown in details.
4. Install retaining plate in groove on actuator side of damper using 1/4" (6) dia. nut and bolt through splice clip. Install damper within wall opening as shown in Figure 1 or 2. Install damper plate and clamp using 1/4" (6) dia. nut and bolt through splice clip. Both retaining and damper plates should be tight to the wall.
5. On drywall installations screw the retaining and damper plates to the wall through the 3/16" (5) dia. holes in the corners of the plates. Major diameter or body of screws must engage metal or wood studs or runners. On masonry installations, the damper plate shown in Fig. 3 should be used. This has four equally spaced clips 1" x 1" x 1" (25 x 25 x 25) 20 gauge (1.0) which are attached to the plate and damper sleeve using 3/16" (5) rivets, tack or spotwelds. (Make sure that fasteners do not interfere with the operation of the damper blade.) For dampers 12" (305) dia. or less, single side retaining plate may be used (damper plate optional) but retaining plate must be fastened to wall or floor with 6 screws instead of 4.
6. The connecting duct shall not be continuous through the wall or floor but shall terminate at each end of the damper sleeve. Sleeves shall extend a maximum of 6" (152) on either side of the wall or floor opening or 16" (406) on one side intended for use with an actuator or an access door. The sleeve may extend a maximum of 16" (406) on each side when access door and actuator are on opposite sides.
7. Connecting ducts shall be attached using three equally spaced #10 sheet metal screws or a 4" (102) wide draw band spanning the joint. Duct sealant may be used. If damper frame/sleeve and connecting duct are 16 gauge (1.61), a rigid duct connection may be used.
8. **Maximum Damper Size:** 24" (610) dia. Minimum size is 6" (152) dia.
9. **Actuator Connections and Accessories:** Combination fire/smoke dampers and qualified actuators are tested together by UL and are factory installed to qualify for damper/actuator standard warranties. Factory installed electric actuators are either 24, 120 or 230 VAC. All wiring must be in accordance with the appropriate electrical codes and NFPA 70. Factory installed pneumatic actuators are rated at and have a maximum pressure of 25 PSI. The pneumatic actuator shall be connected to the air supply thru metallic tubing. A short silicone tubing pigtail is acceptable.

ERL (Electric Resettable Link): Dampers are supplied with an electric thermostat-type temperature responsive device as standard. Refer to Figure 4 for wiring of the ERL. If dampers are ordered with a pneumatic actuator and ERL, an EP switch is required with an appropriate electric power circuit to allow the ERL to control the pneumatic actuator.

When DTO Dual Temperature Override Sensors (MLS-400) or MLS-300 position indicators are used, refer to the installation and wiring instructions for these units. Documents IOM-DTO and IOM-MLS3 (H or N) respectively.

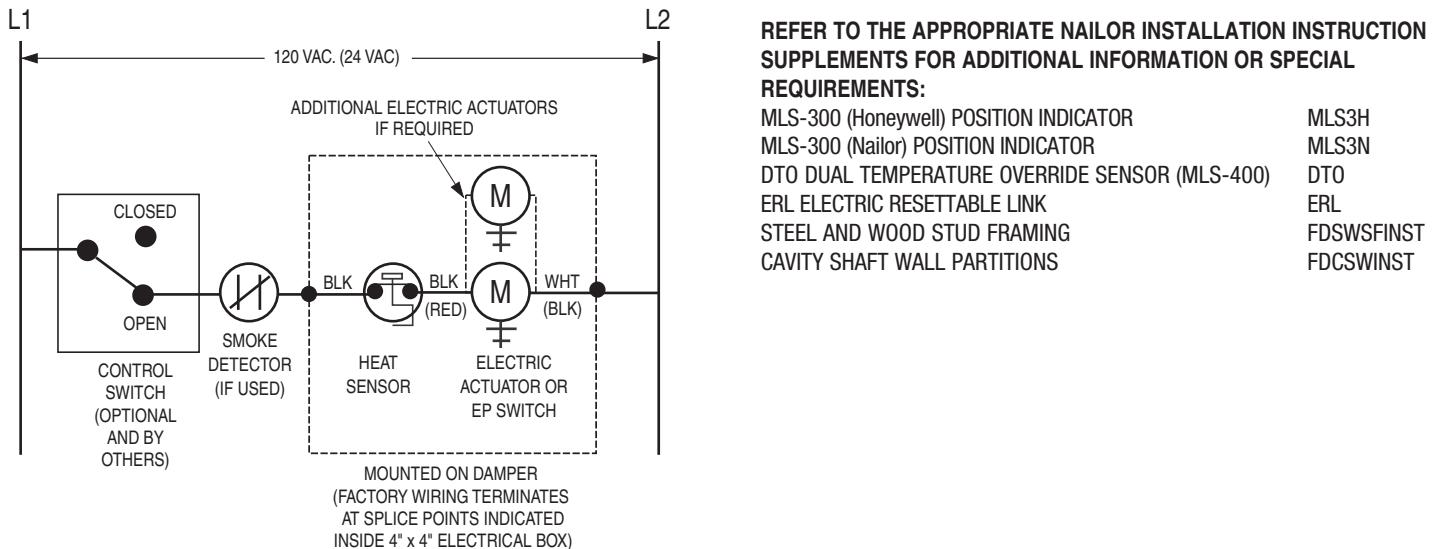


Figure 4. ERL Wiring

Dimensions are in inches (mm).

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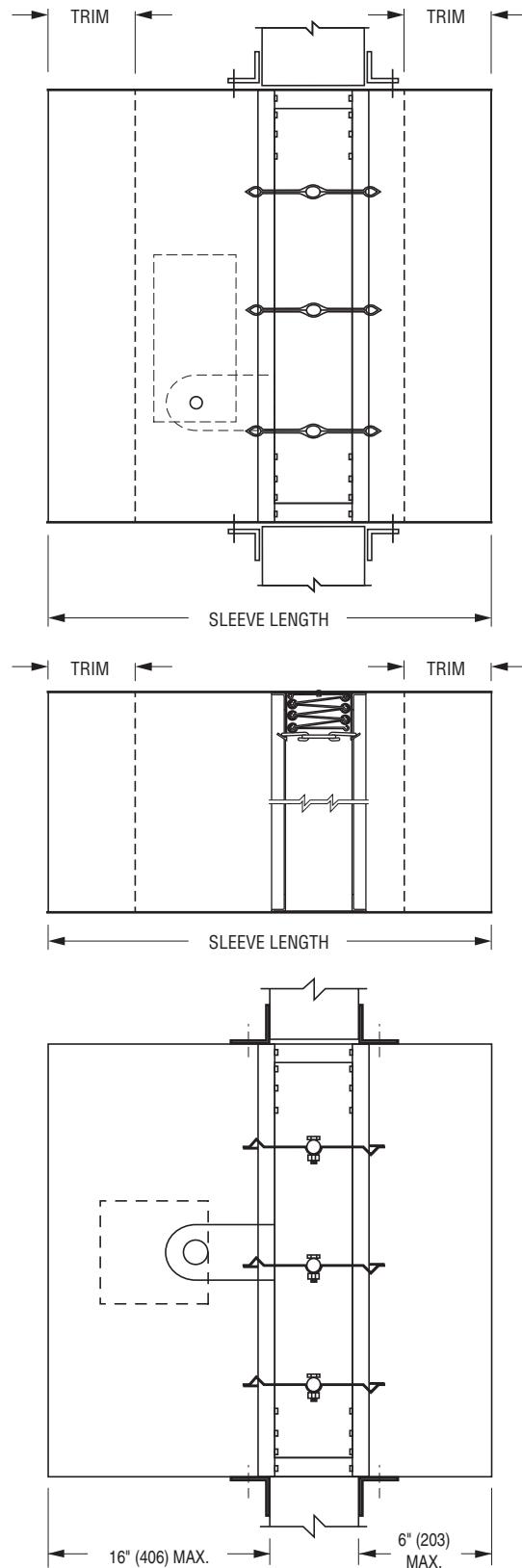
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Tel: 416-744-3300
Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

Trimming of factory-supplied sleeves may be necessary to accommodate field conditions or applications. Other damper components such as actuators and fuse links should not be altered.

NOTES:

1. **Sleeve Length on Non-actuator side:** 6" (152) maximum sleeve length beyond fire-rated barrier on non-actuator side.
2. **Sleeve Length on Actuator side:** 16" (406) maximum sleeve length beyond fire-rated barrier on actuator side.



Dimensions are in inches (mm).



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OPERATION AND MAINTENANCE PROCEDURES SMOKE AND COMBINATION FIRE/SMOKE DAMPERS MODEL SERIES: 1210, 1220, 1260, 1270, 1280 AND 1290

The current edition of NFPA 92, *Standard for Smoke Control Systems*, classifies all systems used to address the impact of smoke from a fire as a Smoke Control System. Smoke control systems are categorized in two ways: as Smoke Containment Systems, the sub-classification of pressurization systems, and Smoke Management Systems, the sub-classification of systems for large-volume spaces. These systems can be further classified as either a Dedicated Smoke Control System (installed for the sole purpose of providing smoke control) or a Non-dedicated Smoke Control System (shares components with another system [i.e. the building HVAC system] and changes the mode of operation to achieve smoke control).

Per NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, periodic inspecting and testing and maintenance of Smoke Dampers shall also be in accordance with NFPA 92 and Combination Fire/Smoke Dampers shall meet the testing requirements prescribed in NFPA 80, *Standard for Fire Doors and Other Opening Protectives*. Consult your local building code to verify whether there is a required maintenance and testing schedule. Most local jurisdictions reference NFPA 105 for smoke dampers and NFPA 80 for combination fire/smoke dampers.

Periodic Inspection, Testing and Maintenance

Per NFPA 92, Dedicated Smoke Control Systems shall be tested at least semiannually and Nondedicated Smoke Control Systems shall be tested at least annually and dampers that are a part of these systems shall be cycled as part of this testing. Per NFPA 80, fire dampers (which includes Combination Fire/Smoke Dampers) shall be inspected 1 year after installation and then every 4 years, except for hospitals where the frequency is every 6 years. In addition to these requirements, NFPA 72, *National Fire Alarm and Signaling Code*, outlines periodic testing requirements for various types of fire alarm systems and components associated with these systems (i.e. Duct Smoke Detectors).

All requirements of testing for actuated smoke and fire/smoke dampers are to be conducted under normal HVAC airflow conditions.

1. Remove any obstructions, dirt, rust, corrosion, or other observed conditions that could impede proper damper operation. Clean damper blades and other moving parts if necessary. Use of a mild detergent or solvents is recommended for any cleaning required.
2. Linkage and jackshaft bearing brackets should be lubricated with a dry lubricant (such as T.F.E. Dry Lube). Never use a regular lubricating oil on dampers, as it will attract dirt and grit. Blade linkage is concealed in the side jamb out of the airstream and is maintenance free. Bearings are self-lubricating oilite bronze.
3. Verify that appropriate power (voltage or pneumatic air pressure) is being supplied to the actuator. Check actuator and tighten the linkage or coupling as necessary. Refer to manufacturer's recommended maintenance procedure for pneumatic and electric actuators.
4. All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, deficiencies detected, and how deficiencies were corrected.
5. Remote Testing: According to the most recent versions of NFPA 80 and NFPA 105, Actuated Smoke and Combination Fire/Smoke Dampers only need to be visually tested at the initial testing during commissioning. This inspection will confirm that the position indication method accurately reflects the full-open and full-closed position of the damper. From this point, all following inspections can be done remotely with the use of the position indicator switches.

Dampers with Position Indicating Device

1. Use the signal from the damper's position indication device to determine if the damper is in the fully open position.
2. Remove air pressure or electrical power from the actuator to cause the actuator's spring return feature to close the damper.
3. Use the signal from the damper's position indication device to determine if the damper is in the fully closed position.
4. Reapply air pressure or electrical power to reopen the damper.
5. Use the signal from the damper's position indication device to determine if the damper is in the fully open position.

Dampers without Position Indicating Device

1. Visually confirm that the damper is in the fully open position.
2. Ensure that all obstructions are out of the path of the damper blades and then remove air pressure or electrical power from the actuator to cause the actuator to spring to the fully closed position.
3. Visually confirm that the damper is in the fully closed position.
4. Reapply air pressure or electrical power to reopen the damper.

Care should be exercised to ensure that all tests are performed safely by personnel wearing the appropriate personal protective equipment and such tests do not cause system damage. All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, deficiencies detected, and how deficiencies were corrected.

Dampers are an essential part of the fire protection system in a building. The NFPA recommends that fire dampers be tested periodically to verify the operational abilities of each installed damper. See NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, for Operational and Periodic Inspection and Testing details.

CAUTION:

High torque helical spring under tension, ensure HVAC fans are turned off. Testing spring assisted fire dampers under airflow conditions is **NOT RECOMMENDED** and may severely damage or destroy ductwork. Use protective eyewear or safety glasses. Keep hands out of the blade path, as this can cause serious injury. Keep any hard objects or tools out of the blade path as they can damage the blades when closing.

Releasing of the fusible link

1. Using a suitable heat source, apply heat at a slightly higher temperature than the rating of the fusible link until the link melts. When applying the heat to the fusible link position the heat source in a manner so no heat is directed towards the spring as the excessive heat can negatively affect the spring performance.

AS SOON AS THE LINK HAS MELTED, THE SPRING WILL FORCE THE BLADES TO CLOSE INSTANTANEOUSLY. THE BLADE PATH MUST BE KEPT CLEAR.

Reloading the spring assembly

2. Loosen the jackshaft from the bolt on crank arm quadrant, located on the jackshaft side opposite of the spring assembly (**A**). Do not remove the bolt completely. See Detail 1.

3. Attach a pair of vise grips on the jackshaft (**B**) and turn upwards until the two pins on the spring assembly are at a distance at which the new fusible link can be installed (**C**). This is approximately 90° of rotation. See Detail 2.

Note: On smaller size dampers, two vise grips may be required to open the damper. Use one vice grip to open as much as the duct free area will allow, then set the second vise grips on the jackshaft per above. Unlock the first set of vise grips, remove and turn the second set upwards as free area will allow. Repeat as necessary.

4. Place the new fusible link over the two pins on the spring assembly (making sure temperature rating is visible) and locate in the pin grooves (**C**). See Detail 2.

Required Items:

- (1) Protective eyewear or safety glasses
- (1) Pair of work gloves
- (1) Suitable heat source
- (2) Vise grips
- (1) 1/2" (13) wrench
- (1) Needle nose pliers
- (1) Replacement "Globe" Fusible link per damper section, of the same temperature rating as the original link.



Detail 1



Detail 2

5. Manually open the damper to 100% full open position (D). See Detail 3.

6. Tighten the bolt on the crank arm (E). See Detail 3.

Reopening spring assisted fire dampers may be extremely difficult and in some cases, impossible. If it is determined that the damper is impossible or impractical to test or reopen, a thorough examination of the blade path is required to ensure that nothing will prevent the damper from closing. Common obstructions include: racked damper frames, retaining angle installation screws, construction debris and contaminants.



Detail 3

Periodic Inspection, Testing and Maintenance

Consult your local building code to verify whether there is a required maintenance and testing schedule. Most local jurisdictions reference NFPA 80 for Fire Dampers.

Per NFPA 80, each damper should be inspected 1 year after installation and then every 4 years, except for hospitals, where the frequency is every 6 years.

1. Remove any obstructions, dirt, rust, corrosion, or other observed conditions that could impede proper damper operation. Clean damper blades and other moving parts if necessary. Use of a mild detergent or solvents is recommended for any cleaning required.

2. Check closure springs. If damaged or defective, repair or replace.

3. Linkage and jackshaft bearing brackets should be lubricated with a dry lubricant (such as T.F.E. Dry Lube). Never use a regular lubricating oil on dampers, as it will attract dirt and grit. Blade linkage is concealed in the side jamb out of the airstream and is maintenance free. Bearings are self-lubricating oilite bronze (or stainless steel for -SS models).

4. If firing of the fusible link is not required by local code, cycle damper with its quadrant handle to verify that it fully opens and closes. HVAC fans should be shut down. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

5. All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, deficiencies detected, and how deficiencies were corrected.

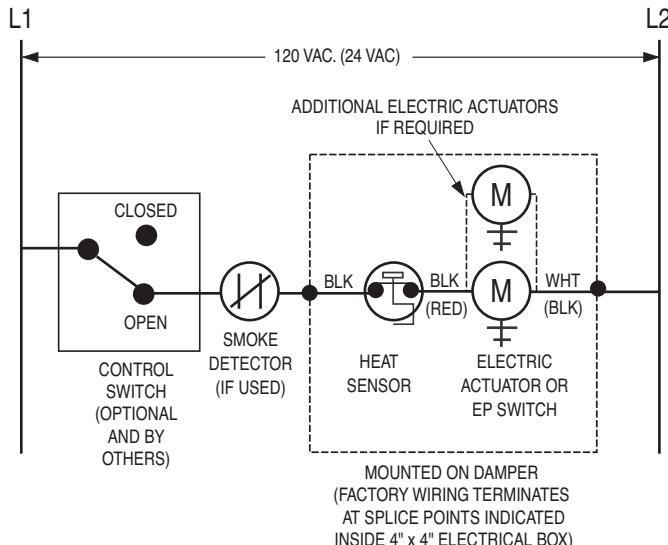
Receiving, Storage, Preparation

Upon delivery, inspect shipping containers and contents closely. Note any damages on freight carrier's delivery receipt.

Store dampers in a cool, dry and safe location in an orderly manner away from construction site, warehouse traffic, other materials, etc. Cover with plastic sheeting to protect from excessive moisture, dirt and debris.

Inspect dampers prior to installation. Dampers must be cleaned per procedures outlined in this document prior to installation if dirt, rust or corrosion is observed.

SPARE PARTS LIST	PART NUMBER
Fusible Links: Model 1200, 1250, 1290	165°F/74°C 212°F/100°C
	B2-037 B2-038



Application and Operation

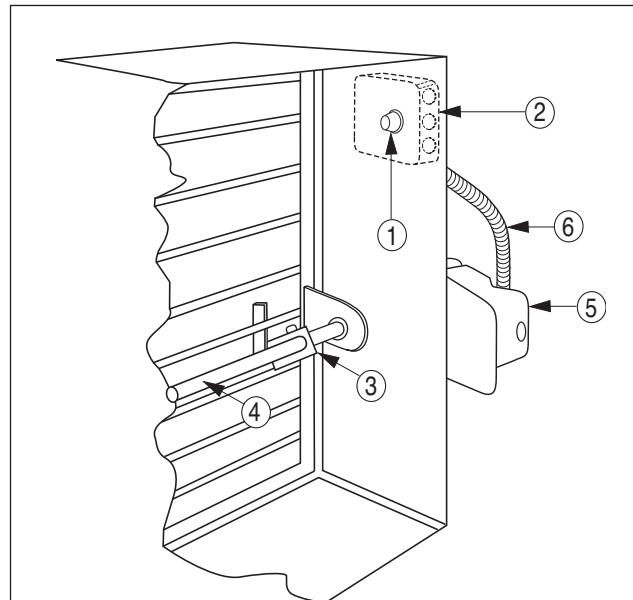
The ERL Electric Resettable Link (heat sensor) replaces the traditional hi-torque spring / fusible link fire closure mechanism on all Nailor combination fire / smoke dampers. The ERL is a thermally responsive bimetal disc / thermostat that opens and closes electrical contacts at a specific calibrated temperature. The ERL is a UL Classified Heat Responsive Device.

The standard ERL on all Nailor, combination fire / smoke dampers has a fixed temperature setting of 250°F (121°C) which is the UL listed elevated / degradation temperature of the damper / actuator assembly. A 350°F (177°C) elevated temperature classification and ERL is available as an option.

[A 165 and 212°F (74 and 100°C) ERL are also available. Local codes have specified 165°F (74°C) widely in the past.]

The ERL performs the same function as the fusible link it supercedes, that is to sense an abnormally high temperature, as caused by a fire and allow the damper to close in order to prevent the spread of fire and smoke. The sensor interrupts power to the actuator and the actuator's spring return mechanism causes the damper to close and lock.

In smoke control mode, when a signal is detected via a normally closed smoke detector connection, the damper will close and remain closed until the smoke signal ceases. The system will then reset when power is re-applied and the damper will open. The damper may be closed at anytime by placing a control switch (optional and by others) in the closed position.



Description:

1. ERL 165, 212, 250, 350 Electric Resettable Link (heat sensor)
2. Electrical Junction Box (and EP switch with pneumatic actuator)
3. Over-Center Knee Lock
4. Jackshaft
5. Actuator
6. Flexible Conduit

The ERL in combination with all Nailor qualified electric or pneumatic actuators provides controlled closure and eliminates the instantaneous damper closure associated with traditional fusible links that can cause damage to the ductwork.

The ERL sensor is of the manual reset type and can be reset after the temperature has cooled down below the sensor set point. This feature is a tremendous advantage where periodic system testing involves application of heat to the sensor to verify correct damper operation. Exposure to actual fire conditions may render these devices unusable. In this case, it is recommended that a careful inspection of the damper, actuator and ERL be performed.

The ERL requires factory installation and wiring together with the associated actuator to meet UL requirements. If the damper is provided with a pneumatic actuator, an EP switch is required.



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APPLICATION

The MLS-300 Position Indicator Package contains two independent 360° rotary switch cams for use in conjunction with certain Honeywell electric actuators. It provides an on / off signal at two adjustable points in the actuator stroke. This signal can be routed to a Fire Fighters' Smoke-Control Station for remote damper position status in Smoke Control Management Applications.

The MLS-300 is usually factory mounted for Fire / Smoke and Smoke Damper applications, but can be field installed.

ELECTRICAL SWITCH RATINGS:

Switching

Single-pole, double-throw (SPDT) micro switches.

Switching Differential

Three angular degrees maximum.

Electrical Switch Ratings (at 240 Vac):

At or below 240 Vac:

Resistive Load: 8A

Inductive Load: 2A

At 125 Vdc: 0.5A

At 250 Vdc: 0.25A

Pilot Duty: 4A, 125 Vac.

Cable

Double insulated, -40°F to 130°F (-40°C to 54°C).

Conduit (not included)

3/8" flexible.

Operating Temperature

-40°F to 350°F (-40°C to 177°C). UL555/555S

Rating and Approvals:

Base Model: Honeywell 32003532-005

UL Recognized file No. E4436.

UL94-5V Plenum rating

Cable: UL Style 1180 rated 300V, 200 C, 18 gauge.

NEMA2

! CAUTION

Electrical shock or Equipment Damage Hazard.

Can shock individuals or short equipment circuitry.

Disconnect power supply before installation and always keep device assembled.

! CAUTION

Actuator Damage Hazard.

Turning motor output hub by hand or wrench can damage internal gears.

Forcibly turning the motor shaft damages the gear train.

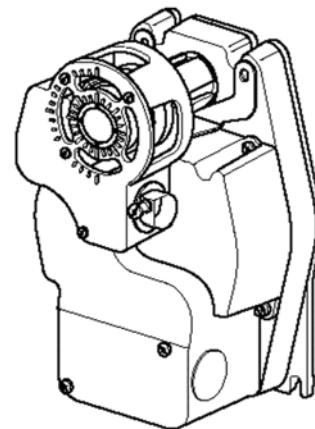


Figure 1. Honeywell ML4X02/8X02, ML4115/8115 or MS4X09/8X09 electric actuators with MLS-300 (Honeywell) position indicator package.

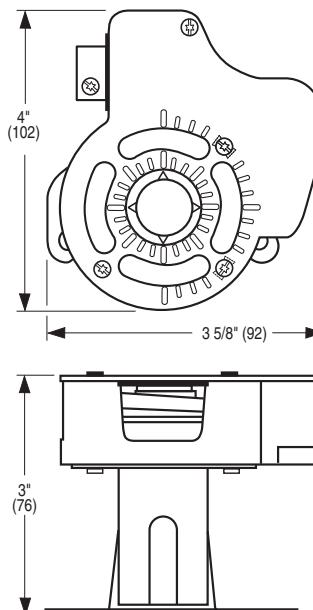


Figure 2. Dimensional detail

Factory Installation

When factory installed the switch is factory set for full open and full closed positions.

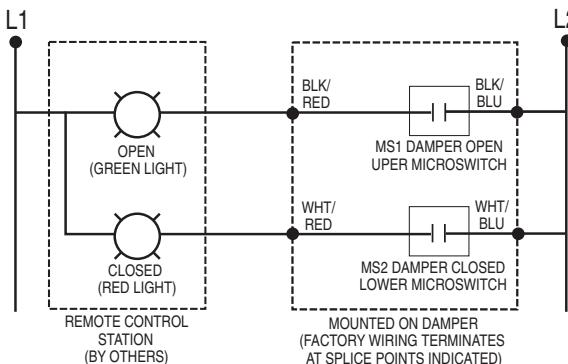


Figure 3. Wiring schematic

Standard Mounting:

MS1 is damper open signal.

MS2 is damper closed signal.

Non-Standard Mounting:

Important: Installer must double check continuity of MS1 and MS2 before wiring to determine which switch signals the damper's open or closed position.

Field Installation

Prior to installation first...

1. Read instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check ratings and description given in specification to make sure product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

Procedure:

1. Determine desired switching action (if switch is to energize during clockwise or counterclockwise rotation).

Note: With switch cam as shown in Figure 4, the normally closed contact opens during counterclockwise rotation and the normally open switch closes.

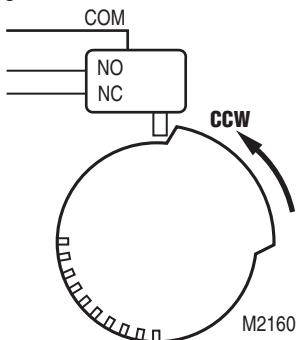


Figure 4. Switching configuration (top view) for counterclockwise rotation.

Conversely, with the switch cam as shown in Figure 5, the normally closed contact opens during clockwise rotation and the normally open switch closes.

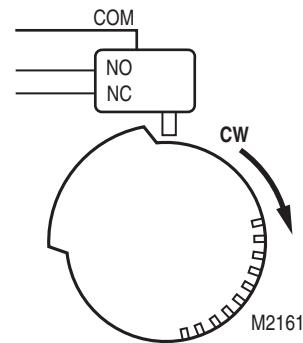


Figure 5. Switching configuration (top view) for clockwise rotation.

Note: Switches can be set prior to installation on the actuator if angular switch positions are known.

2. Align the switch hub with the setscrews on the actuator. See Figure 1.
3. Mount the switch on the actuator and tighten the two screws.
4. Determine switch position settings based on the angular indications molded into the housing.
5. Move each cam inside switch assembly to the appropriate position. Remember the direction of travel of the cam for switching purposes (see Figure 4 and 5). Monitor the switch closure with an ohmmeter for a continuity check. See Table 1.

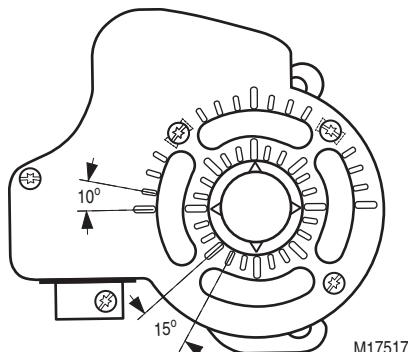


Figure 6. Angular indications of switch

Switch	Normally Open	Normally Closed
Activated	Zero ohm	Infinite ohms
Not Activated	Infinite ohms	Zero ohm

Table 1. Proper continuity measurements.

Connection	Upper Switch	Lower Switch
Common	Black / Red	White / Red
Normally Closed	Black / Yellow	White / Yellow
Normally Open	Black / Blue	White / Blue

Table 2. Position Indicator Switch Wiring Connections.

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Dimensions are in inches (mm).



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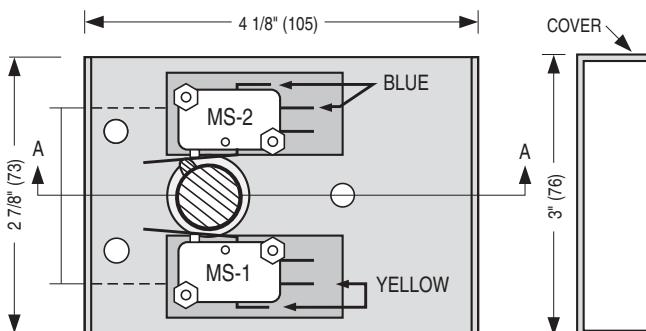
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Toronto, Canada
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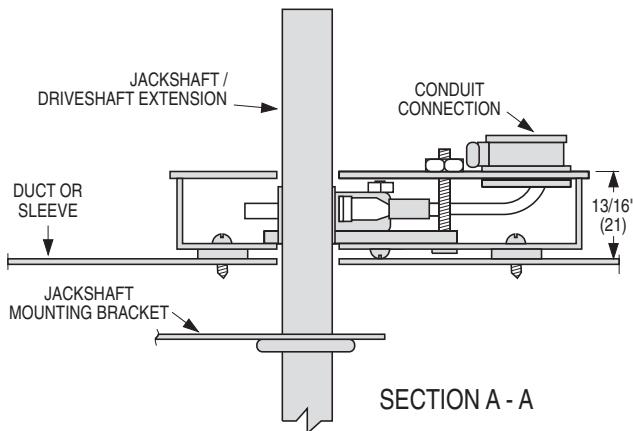
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Fax: 403-279-5035

APPLICATION:

- The MLS-300 Position Indicator Package operates as a function of the damper blade position and provides the ability to remotely indicate damper blade position.
- The MLS-300 incorporates two SPDT switches and provides a positive open or closed signal when used in conjunction with remote indicator lights. MLS-300's are used in active smoke control management systems to positively indicate the status of all combination fire/smoke and smoke dampers in the building.
- The MLS-300 is available only as a factory installed option on combination fire / smoke dampers.

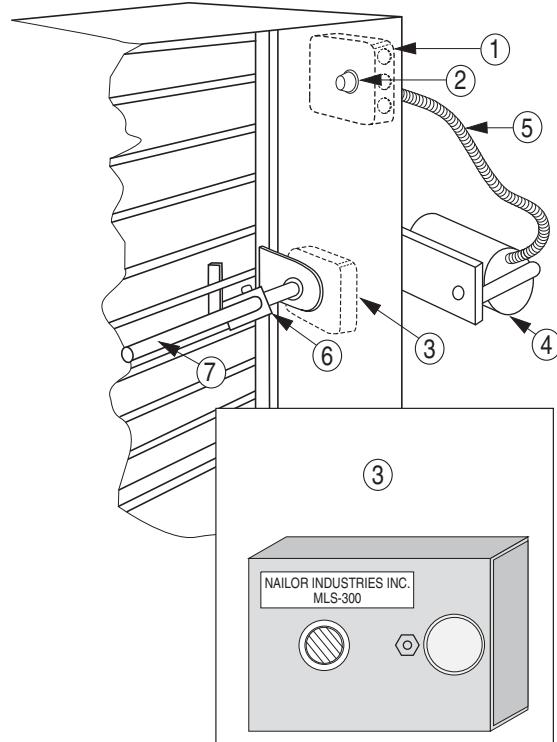


EXTERNAL RIGHT HAND MOUNTING: FRONT VIEW (LESS COVER)



Position Indicator Microswitch Data:

Switch Type: Single Pole double throw (2)
 15 Amps, 1/3 HP, 125, 250 Vac or 24 Vdc.
 1/2 Amp, 125 Vdc. 1/4 Amp, 250 Vdc.



Typical Combination Fire / Smoke Damper Installation With UL Listed Actuator

Description:

1. Electrical Junction Box. [and EP switch with pneumatic actuator(s)]
2. ERL 165, 212, 250, 350 Electric Resettable Link (Heat Sensor)
3. MLS-300 Position indicator package
4. Actuator (pneumatic illustrated).
5. Silicone Tubing or Flexible Conduit
6. Over-Center Knee Lock
7. Jackshaft

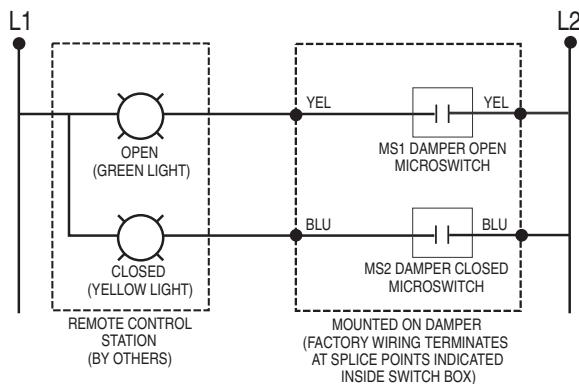


Figure 1. MLS-300 Wiring Schematic.

Dimensions are in inches (mm).

Electrical Connections:

1. Remove cover of junction box. There are four or six coded color wires. Four wires are the MLS-300 position indicator package. If six wires are present, the additional two are the field connection for either an electric actuator or an EP switch for a pneumatic actuator.

MS1 is damper open signal.

MS2 is damper closed signal.

Important: Installer must double check continuity of **MS1** and **MS2** before wiring to confirm which switch signals the damper's open or closed position.

2. Connect external wiring and electrical power supply (120 or 24 Vac) in accordance with N.E.C. and any applicable local codes.
3. Replace junction box cover and check operation.

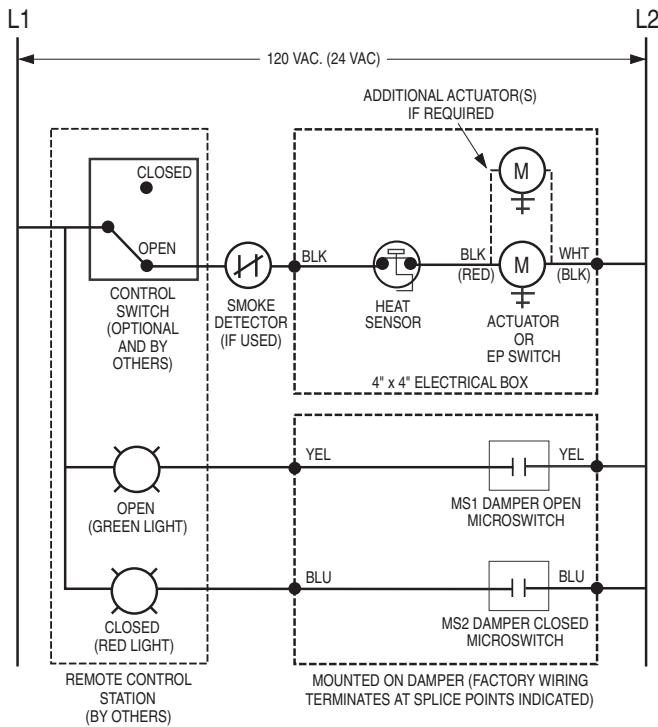


Figure 2. Combination Fire/Smoke Damper Wiring Schematic.

Dimensions are in inches (mm).

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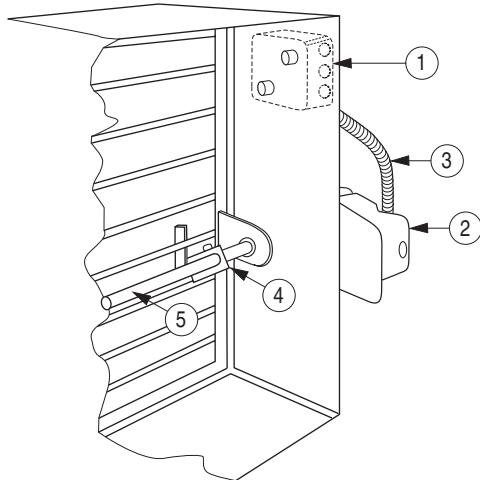
The DTO Dual Temperature Override Sensor (formerly MLS-400) is a factory installed option on Nailor combination fire/smoke dampers, incorporating two electric heat sensors. A primary heat sensor (manual reset) automatically closes the damper upon sensing an elevated temperature of 165°F (74°C) at the damper. The sensor interrupts power to the actuator, and the actuator's spring return mechanism causes the damper to close. The damper may be closed at anytime by placing a control switch (by others) in the closed position.

The primary heat sensor and the smoke detector (if used) can be bypassed by an external electrical signal from a remote control station, allowing the damper to reopen as may be required in the operation of a smoke control system. The Fire Fighter's Smoke-Control Station must include a three position (double throw, center off) master switch for correct operation.

The damper remains operational until the the temperature at the damper reaches that of the high limit secondary heat sensor. This is the UL listed elevated/degradation temperature rating (operational limit) of the damper/actuator assembly. The standard high limit temperature is 250°F (121°C). A 350°F (177°C) elevated temperature classification is available as an option. When the temperature of the high limit heat sensor is exceeded, the damper closes and locks and remains closed thereafter, in conformance with UL 555 and NFPA 90A. The primary and secondary sensor can be manually reset at the damper using external reset buttons, after temperatures have cooled down.

The DTO can be ordered with electric (120, 24 or 230 VAC) or pneumatic actuators. Pneumatic actuators are supplied with a factory mounted EP (electric/pneumatic) switch.

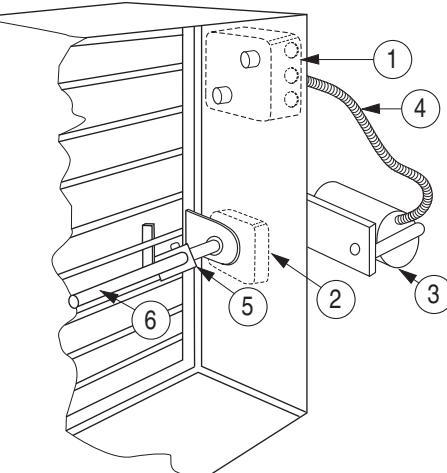
The DTO Fire Sensor also incorporates a position indicator package. Two auxiliary switches indicate the open and closed damper position at a remote control station.



With UL Listed Electric Actuator

Description:

1. Electrical Junction Box with 165°F (74°C) primary heat sensor and High limit secondary heat sensor 250° or 350°F (121° or 177°C)
2. Electric Actuator with auxiliary position indicator switches
3. Flexible Conduit
4. Over-Center Knee Lock
5. Jackshaft



With UL Listed Pneumatic Actuator

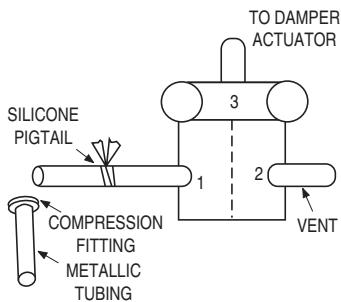
Description:

1. Electrical Junction Box with 165°F (74°C) primary heat sensor and EP switch and High limit secondary heat sensor 250° or 350°F (121° or 177°C)
2. Position Indicator Package
3. Pneumatic Actuator
4. Silicone Tubing
5. Over-Center Knee Lock
6. Jackshaft

INSTALLATION:

Pneumatic Connection:

Connect the #1 air inlet port of the electric pneumatic (EP) switch mounted on the electric junction box to the pneumatic main air supply (1/8" [3] NPT barbed fitting). Metallic tubing requires a silicone tubing pigtail and compression fitting (by others). Rated operating main air pressure is 25 psi.



Electrical Connections for Pneumatic or Electrical Actuators

1. Remove cover of junction box. There are seven coded color wires. Consult applicable wiring diagram, see Figures 1, 2 and 3. Color coding of position indicator microswitches (Aux. switches) varies dependent upon actuator.

MS1 is damper open signal.

MS2 is damper closed signal.

Important: Installer must double check continuity of **MS1** and **MS2** before wiring to confirm which switch signals the damper's open or closed position.

2. Connect external wiring from the remote control panel and electrical power supply (120, 24 or 230 VAC) in accordance with N.E.C. and any applicable local codes.
3. It is essential that the remote controls include a 3-position master control switch (single pole double throw, center off) and that it is connected to operate as shown.
4. Replace junction box cover and check operation.

OPERATION:

Circuit Test

Combination fire/smoke dampers with the DTO Dual Temperature Override Sensor option are supplied with factory mounted spring return actuators that have a power open/fail closed (normally closed) damper connection.

1. Place master control switch (MCS) in center closed position.
2. Apply power. The damper will remain closed and the closed (red) indicator light will go on.
3. Place MCS in reopen (override) position. The damper will open. The closed (red) indicator light will go off and the open (green) indicator light will go on. Note: When the MCS is in the reopen (override) position, the smoke detector (if used) and primary heat sensor are bypassed. The damper will remain open even if the primary heat sensor has been activated. Do not leave MCS in reopen position.
4. Place MCS in the normal (auto) position. The damper will remain open and the open (green) indicator light will remain on.

Emergency Operation (Smoke Control Management)

1. MCS Normal Position

(a) **Fire Control:** The damper is open and will remain so until the primary heat sensor activates when temperatures at the damper reach 165°F (74°C), when the damper will close. The primary heat sensor is a manual reset device and the damper will remain closed until the override signal for smoke management from a remote command station is present and the duct temperature has not exceeded the high limit. If temperatures reach the elevated temperature rating of the damper/actuator assembly (250°F or 350°F [121° or 177°C]), the high limit secondary heat sensor will either prevent the damper from reopening or will close and lock the damper, rendering it inoperable from a remote location. A manual reset button is provided on the DTO that may be used to reopen damper upon cessation of fire conditions.

(b) **Smoke Control (Optional):** If a smoke detector (wired with normally closed contacts) is included in the design, when activated, power to the actuator is interrupted and the damper will close.

2. MCS Closed Position

The damper will close regardless of whether the primary heat sensor or smoke detector has activated or not.

3. MCS Reopen Position

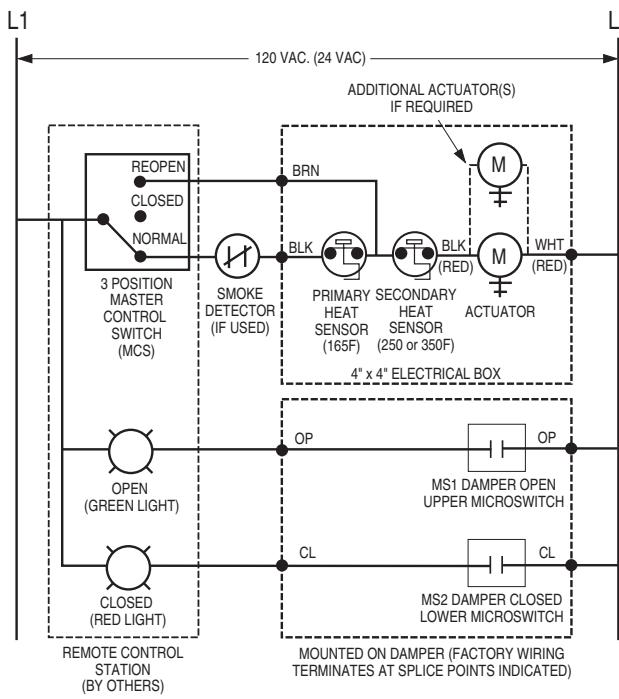
If the damper has not been exposed to an elevated temperature higher than its rating (250°F or 350°F [121°C or 177°C]), the damper will open, bypassing the primary heat sensor and smoke detector regardless of whether they have been activated or not. This provides control of the smoke management system and is to be done only by an authorized party per NFPA 92, Smoke Control Systems. If the damper has been exposed to an elevated temperature higher than its temperature degradation rating (250°F or 350°F [121°C or 177°C]), the damper will close and remain closed under all conditions (regardless of any MCS position) in accordance with NFPA 90A.

Testing

Damper system testing may be done by:

1. Remotely using the master control switch (MCS) to cycle the damper.
2. Activating the smoke detector.
3. Periodic Inspection, Testing and Maintenance.

Refer to IOM-FSDIMP Operation and Maintenance procedure.

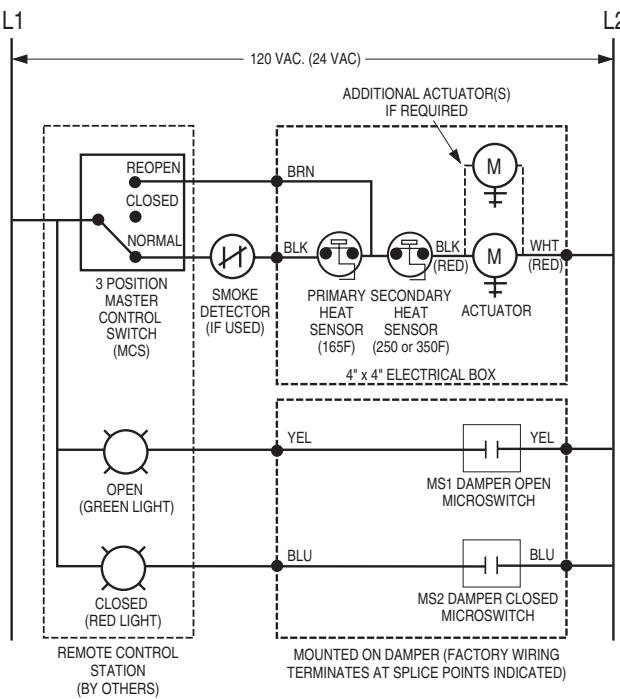


POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2). AT OR BELOW 240 VAC: RESISTIVE LOAD: 8A. INDUCTIVE LOAD: 2A. AT 125 VDC: 0.5A. PILOT DUTY: 4A, 125 VAC.

Fig. 1. DTO with Belimo Electric Actuators with built-in Auxiliary Switches.

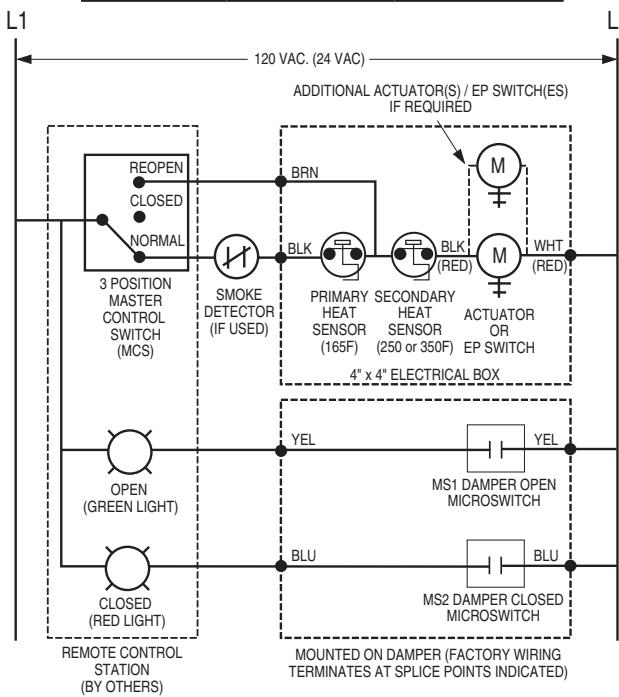
Belimo Actuator Auxiliary Switch Wiring Connections

Model Series	Open (OP)	Closed (CL)
FSTF	Orange / Gray	Violet / Red
FSLF / FSAF	Gray / Gray	Violet / Violet
FSNF / FSAFB	White S4 / S6	White S1 / S2



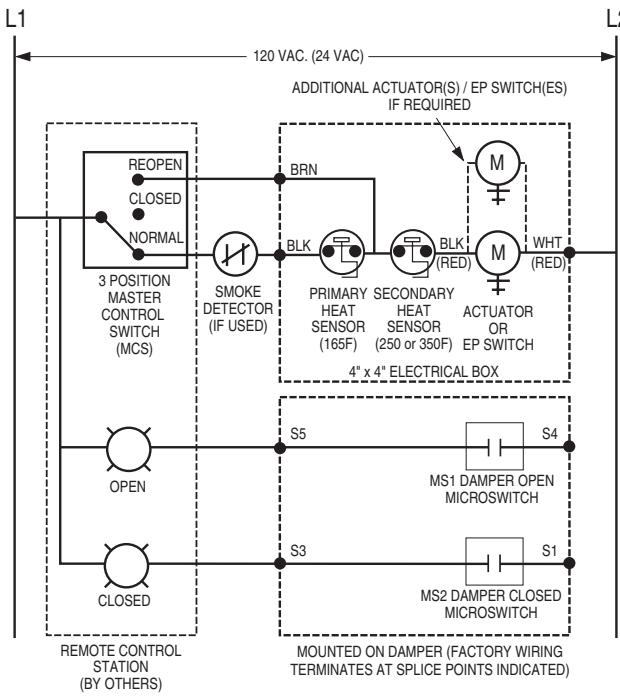
POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE SINGLE THROW (2). MAX. LOAD: 250VAC, 5A RESISTIVE, 4A INDUCTIVE.

Fig. 2. DTO with Honeywell Electric Actuators with built-in Auxiliary Switches.



POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2). 15A, 125, 250 VAC OR 24 VDC. 0.5A, 125 Vdc, 0.25A, 250Vdc.

Fig. 3. DTO with Electric (Belimo, Honeywell, Siemens) or 331-2961/3060 (pneumatic) actuators and Nailor position indicator package.



POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2). 15A, 125, 250 VAC OR 24 VDC. 0.5A, 125 Vdc, 0.25A, 250Vdc.

Fig. 4. DTO with Siemens GJD Series Electric actuators with built-in Auxiliary Switches.



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Application and Operation

The Nailor PRL Pneumatic Replaceable Link is a UL Classified heat responsive device used in conjunction with Nailor combination fire/smoke dampers.

The PRL is supplied as standard on all combination fire/smoke dampers ordered with a pneumatic actuator. An alternative to the PRL would be the Nailor ERL (Electric Resettable Link) with an EP (Electric/Pneumatic) Switch.

The PRL is a factory mounted pneumatic release valve/replaceable fusible link assembly. The PRL's function is to sense an abnormally high temperature, as caused by a fire, and allow the damper to close in order to prevent the spread of fire and smoke.

Fire Control Mode: The PRL activates when fire temperatures in excess of 165, 212 or 280°F (74, 100 or 138°C) are detected. When the fusible link melts, air from the pneumatic actuator(s) is exhausted and the actuator spring return mechanism causes the damper to close and lock.

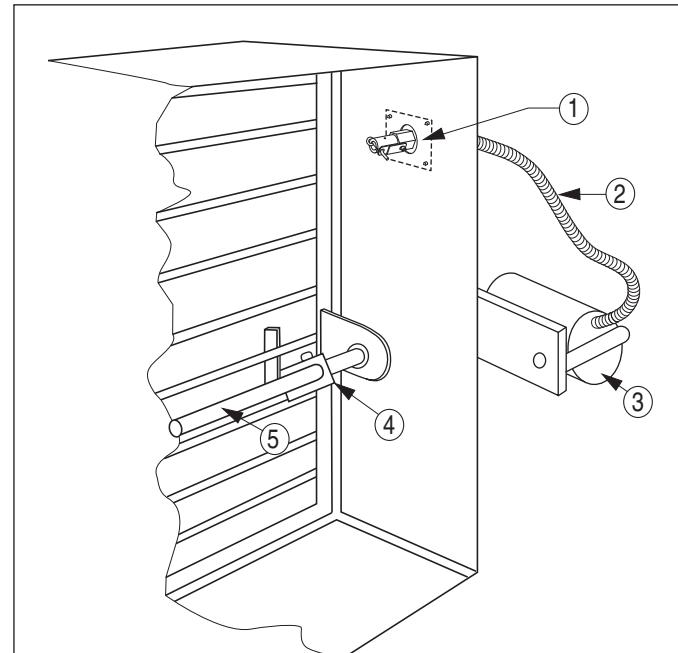
Smoke Control Mode: When a signal is detected via a normally closed smoke detector connection, during system testing or if power failure occurs, the damper will close and remain closed. When the smoke signal ceases (smoke detector reset), the test is completed or power is restored, the damper will automatically reset to the open position.

An EP (Electric/Pneumatic) Switch, by others, must be present in the system.

All pneumatic actuators are factory mounted with a fail close (Normally Closed) damper connection.

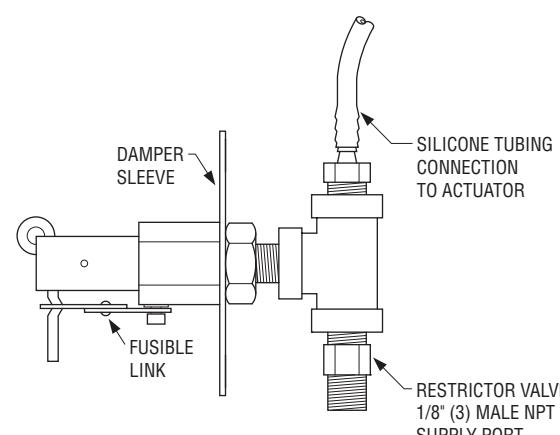
Notes:

1. The PRL must be installed at the factory and cannot be added in the field, in accordance with UL requirements.
2. A singel PRL may be use to control up to a maximum of four pneumatic actuators.
3. Pneumatic actuators are to be field piped per local codes.



Typical Combination Fire/Smoke Damper Detail with UL Listed Pneumatic Actuator Description:

1. PRL 165, 212 or 280°F Pneumatic Replaceable Link
2. Silicone Tubing
3. Pneumatic Actuator
4. Over-center Knee Lock
5. Jackshaft



PRL Top View



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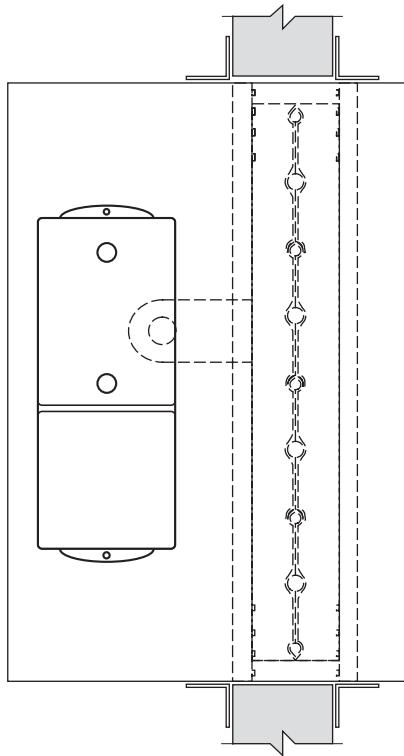


Figure 1: Mounting orientation of smoke detector on dampers with a height greater than or equal to 20" (508).

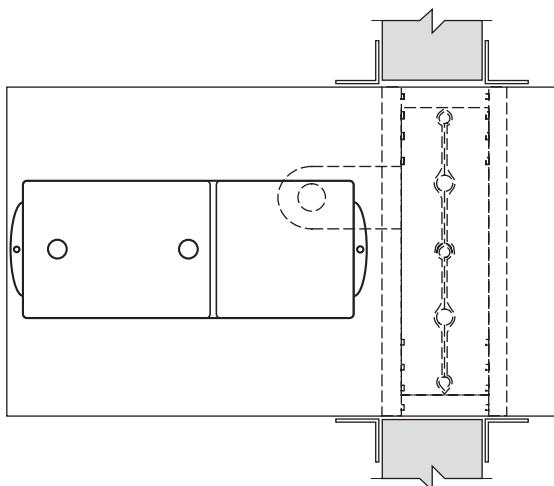


Figure 2: Mounting orientation of smoke detector on dampers with a height less than 20" (508).

UL CLASSIFIED (see complete marking on product)

***UL CLASSIFIED to Canadian safety standards
(see complete marking on product)***

Standard 555 (Listing R9492)

Standard 555S (Listing R9492)

Smoke detector requires 100 fpm minimum air velocity in duct. For damper activation requirements when system velocity is less than 100 fpm, the local authority having jurisdiction should be consulted.

Refer to smoke detector manufacturer and Nailor's installation instruction supplement for dampers with factory mounted smoke detectors.

Label 1: Label applied to dampers with factory mounted smoke detectors.

NOTES:

1. Minimum airflow rating for the smoke detector is 100 fpm. Maximum is 4000 fpm.
2. For further information, refer to System Sensor Model D4120 Installation and Maintenance Instructions.
3. Since the smoke detector is not rated for use at velocities below 100 fpm, local code may require an alternate means of damper closure such as zone detection or automated damper closure when the system fan is shut down.
The local authority having jurisdiction should be consulted prior to the installation of the damper and smoke detector.
4. Correct orientation of holes on detector sampling tube is facing airstream.
5. See following pages for wiring diagrams.
6. Perform all maintenance and field tests recommended or required in System Sensor Model D4120 Installation and Maintenance Instructions.

**WARNING: Duct smoke detectors have specific limitations.
DUCT DETECTORS ARE:**

**NOT a substitute for an open area smoke detector,
NOT a substitute for early warning detection, and
NOT a replacement for a building's regular fire detection system.**

Refer to NFPA 72 and 90A for additional duct smoke detector application information.

120 VAC DSD-LF WIRING SCHEMATICS

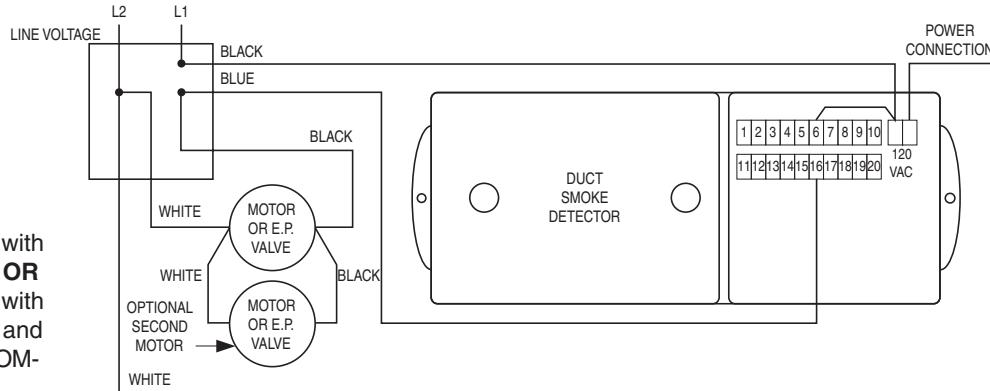


Figure 3: Smoke damper with smoke detector **OR**
Smoke damper with smoke detector and
MLS-300 (see IOM-
MLS3H or IOM-
MLS3N for wiring
detail).

NOTE: CONDUIT RUNS OVER 72" (1829) MUST UTILIZE GREEN GROUND WIRE. FLEXIBLE CONDUIT MUST BE SECURED TO SLEEVE WITH CLAMPS EVERY 24" (610) MAX. ON CENTER AND WITHIN 12" (305) OF CONDUIT END AT THE ACTUATOR OR JUNCTION BOX.

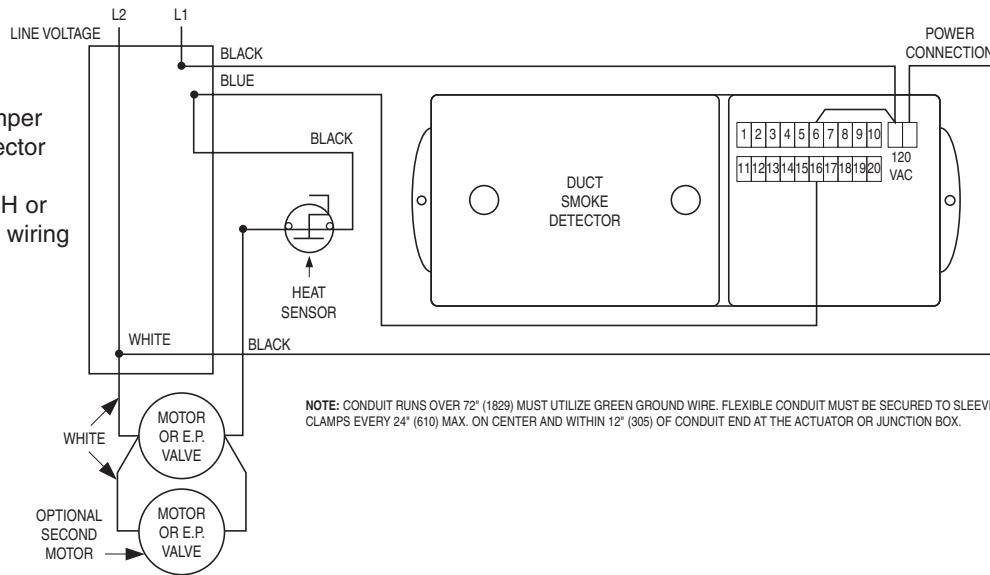


Figure 4: Combination
Fire/Smoke damper
with smoke detector
and MLS-300
(see IOM-MLS3H or
IOM-MLS3N for wiring
detail).

NOTE: CONDUIT RUNS OVER 72" (1829) MUST UTILIZE GREEN GROUND WIRE. FLEXIBLE CONDUIT MUST BE SECURED TO SLEEVE WITH CLAMPS EVERY 24" (610) MAX. ON CENTER AND WITHIN 12" (305) OF CONDUIT END AT THE ACTUATOR OR JUNCTION BOX.

120 VAC DSD-LF WIRING SCHEMATICS (continued)

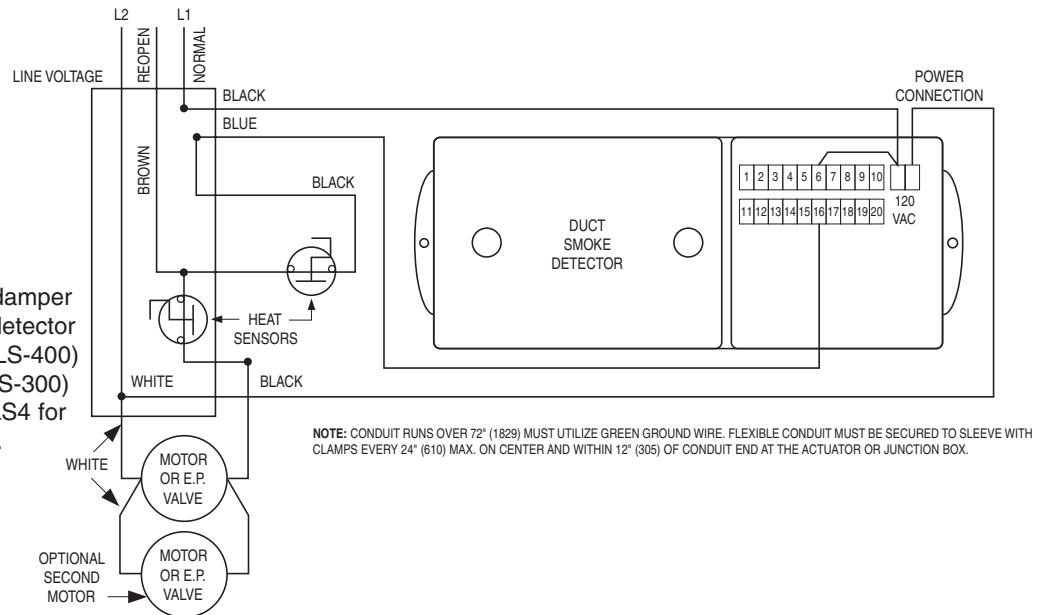


Figure 5: Combination Fire/Smoke damper with smoke detector and DTO (MLS-400) (includes MLS-300) (see IOM-MLS4 for wiring detail).

24 VAC DSD-LF WIRING SCHEMATICS

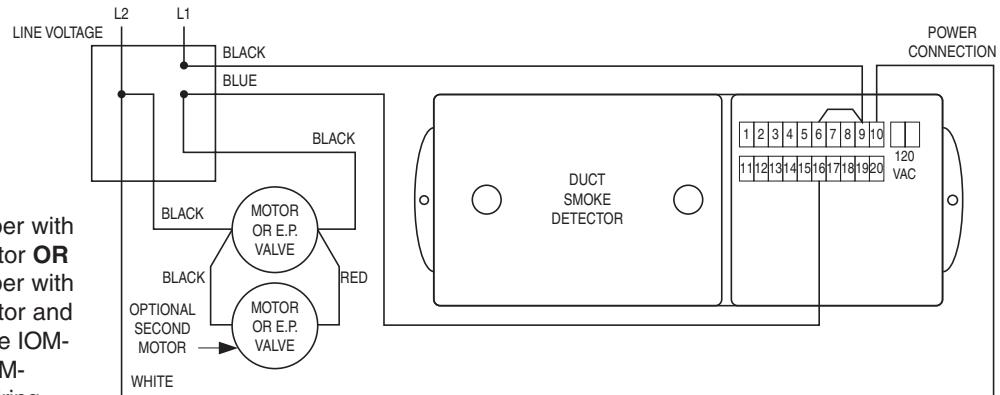


Figure 6: Smoke damper with smoke detector **OR** Smoke damper with smoke detector and MLS-300 (see IOM-MLS3H or IOM-MLS3N for wiring detail).

24 VAC DSD-LF WIRING SCHEMATICS (continued)

Figure 7: Combination Fire/Smoke damper with smoke detector and MLS-300 (see IOM-MLS3H or IOM-MLS3N for wiring detail).

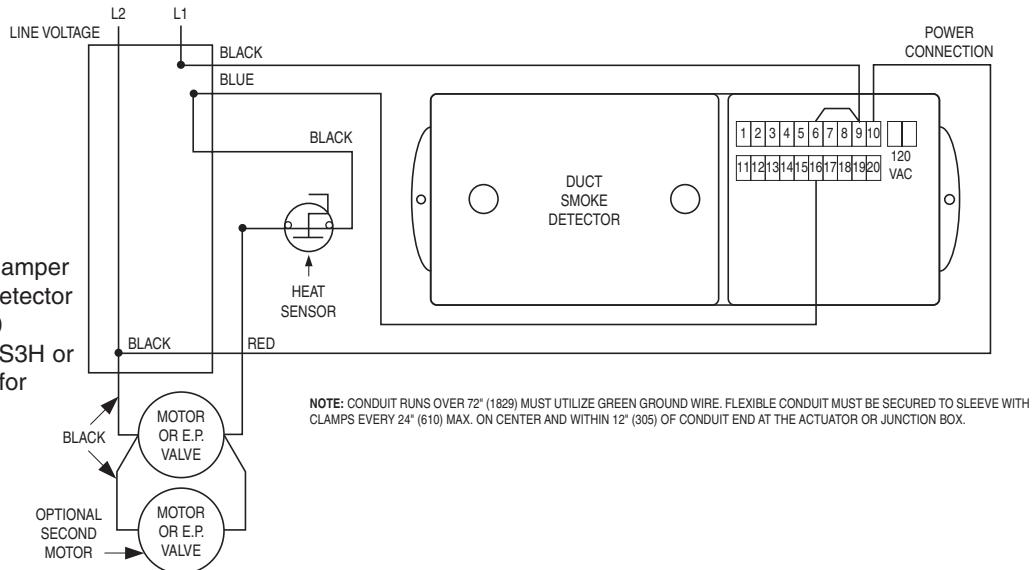
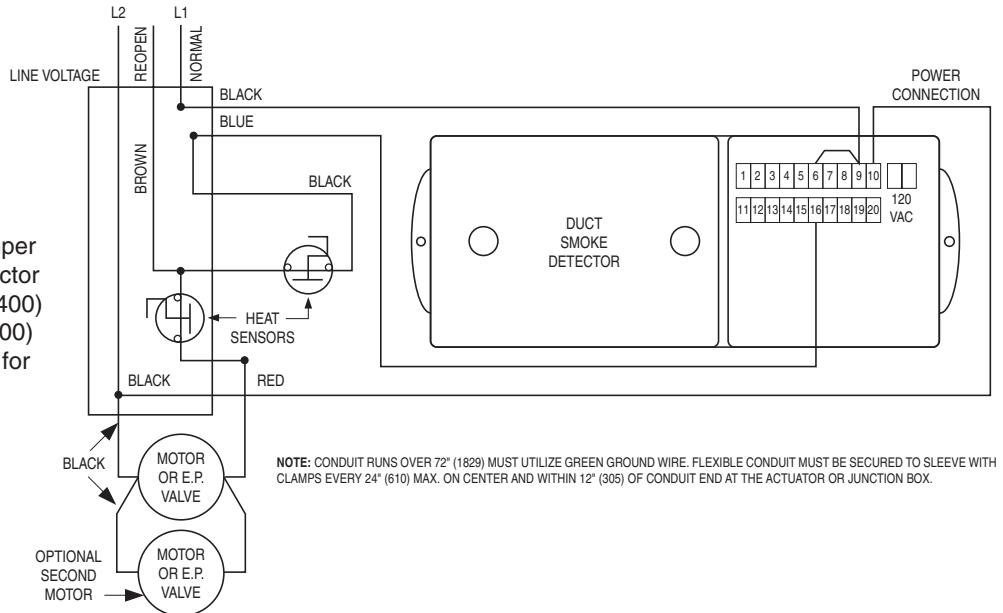


Figure 8: Combination Fire/Smoke damper with smoke detector and DTO (MLS-400) (includes MLS-300) (see IOM-MLS4 for wiring detail).



Application and Operation

Nailor model DSD-NF duct smoke detector (no-flow) can be utilized with Nailor UL555S Classified smoke or combination fire/smoke dampers to detect the presence of smoke within HVAC ductwork, whether or not there is airflow, and close the damper to prevent the smoke from spreading. As most fatalities resulting from fires can be attributed to the effects of toxic smoke, detecting and controlling the smoke from spreading within the HVAC system is vital to preventing injury as well as limiting property damage, including damage to the HVAC system itself. Refer to NFPA Standards 72, 90A and 92A to determine when and where duct smoke detectors are required.

The DSD-NF detector features a low-profile design for optimum pressure drop and will operate with airflow in either direction. It can be factory installed to top of sleeve (side mounting optional) on Nailor Model Series 1210, 1260, 1280, 1220 and 1270.

Upon detection of smoke, the smoke detector causes the damper to close by cutting off power to the actuator. The actuator return spring forces the damper closed. The detector can be reset only by a momentary power interruption. The standard model DSD-NF detector and smoke damper combination is designed simply to close the damper upon detection of smoke. For applications requiring the detector to be wired into a fire fighters' smoke-control station (FSCS), contact Nailor.

DSD-NF STANDARD SPECIFICATION:

Model: System Sensor 2151 Low-Profile.

Sensor Type: Photoelectronic.

Dimensions: 6"(155) dia. flanged base.

Weight: 3.6 oz. (104 g).

Airflow Velocity Range: 0 to 3000 fpm (0 to 15.24 m/s).

Operating Temperature Range: 32°F to 120°F (0°C to 49°C).

Humidity Range: 10% to 93% Relative Humidity non-condensing.

Sensitivity: 3% \pm .7%/ft

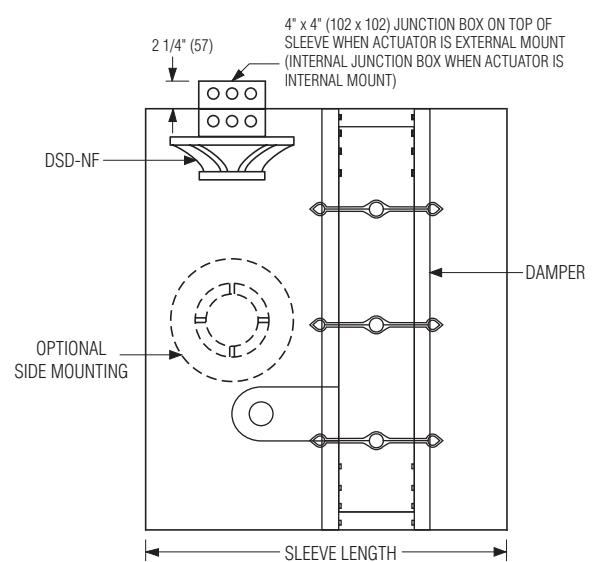
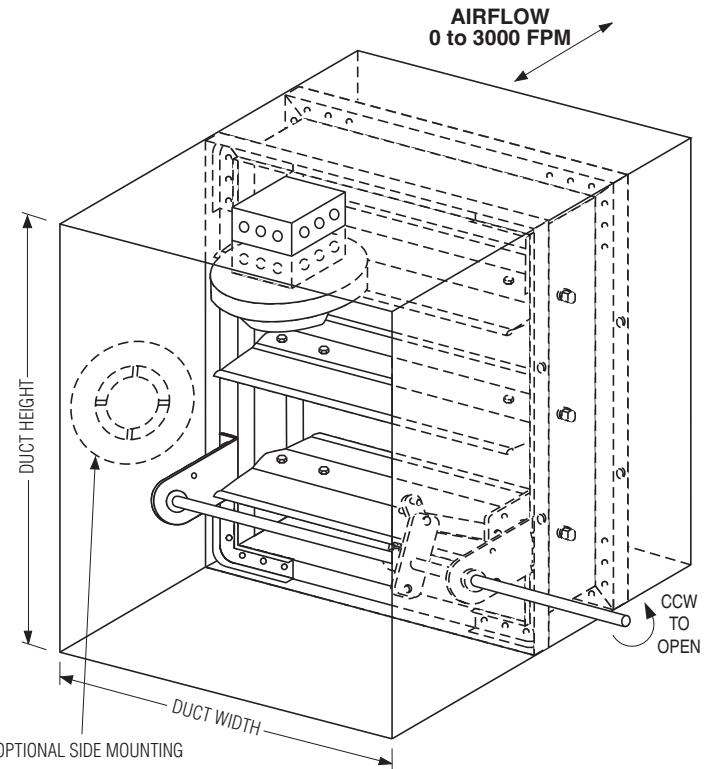
Voltage: 120 VAC, 24 VAC

Latching Alarm: Reset by momentary power interruption.

Contact Nailor for minimum damper size and sleeve length for your specific application.

**Refer to Smoke Detector Installation Instructions and
Nailor Smoke Detector Supplement for Dampers with
Factory Mounted Duct Smoke Detectors.**

**Label 1: Label applied to dampers with factory mounted
smoke detectors.**



120 VAC DSD-NF WIRING SCHEMATICS

Figure 1: Smoke damper with smoke detector.

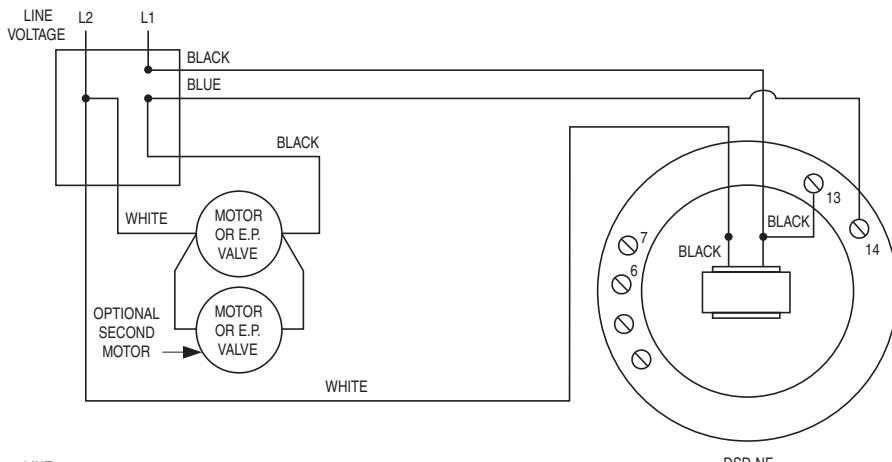


Figure 2: Combination Fire/Smoke damper with smoke detector.

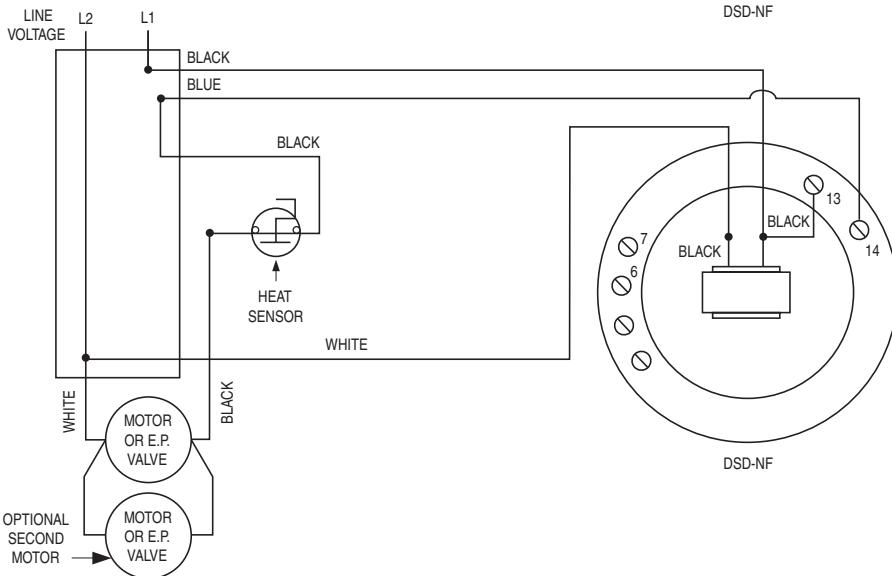
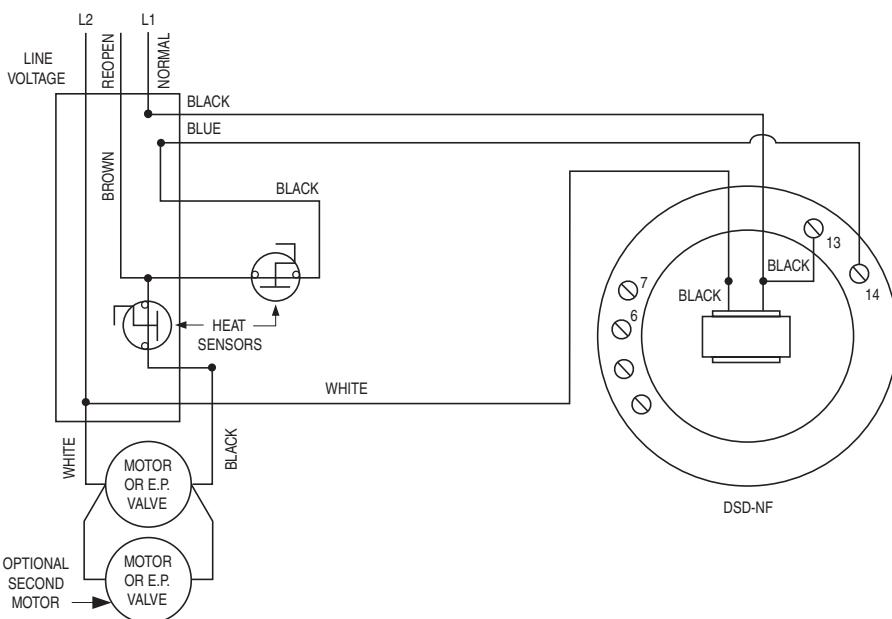


Figure 3: Combination Fire/Smoke damper with smoke detector and DTO (MLS-400) (includes MLS-300) (see IOM-MLS4 and IOM-MLS3H or IOM-MLS3N for wiring details).



24 VAC DSD-NF WIRING SCHEMATICS

Figure 4: Smoke damper with smoke detector.

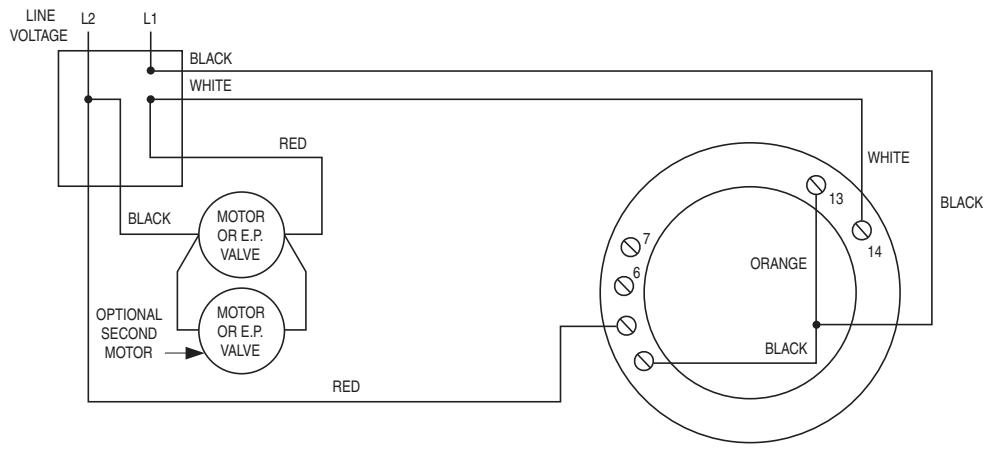


Figure 5: Combination Fire/Smoke damper with smoke detector.

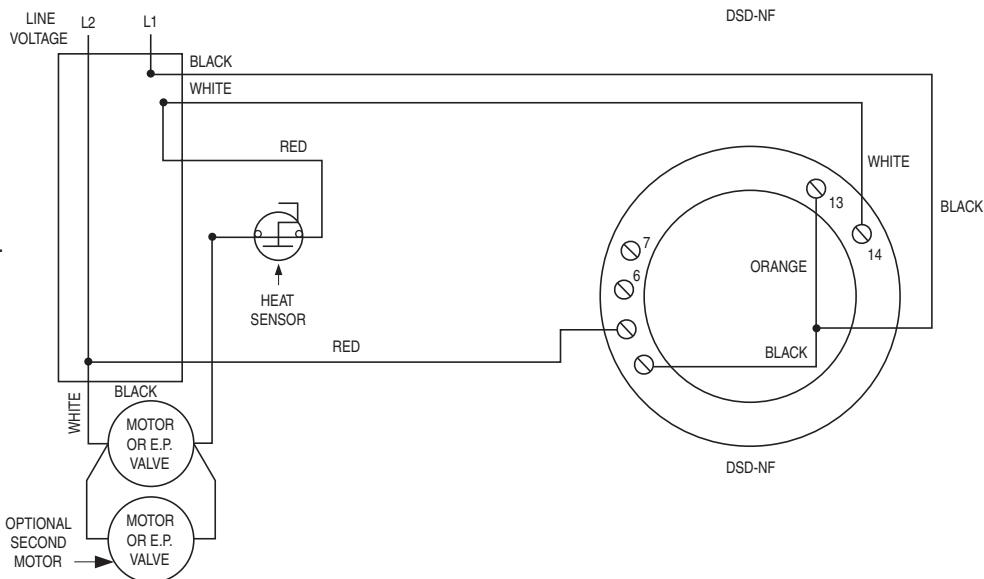
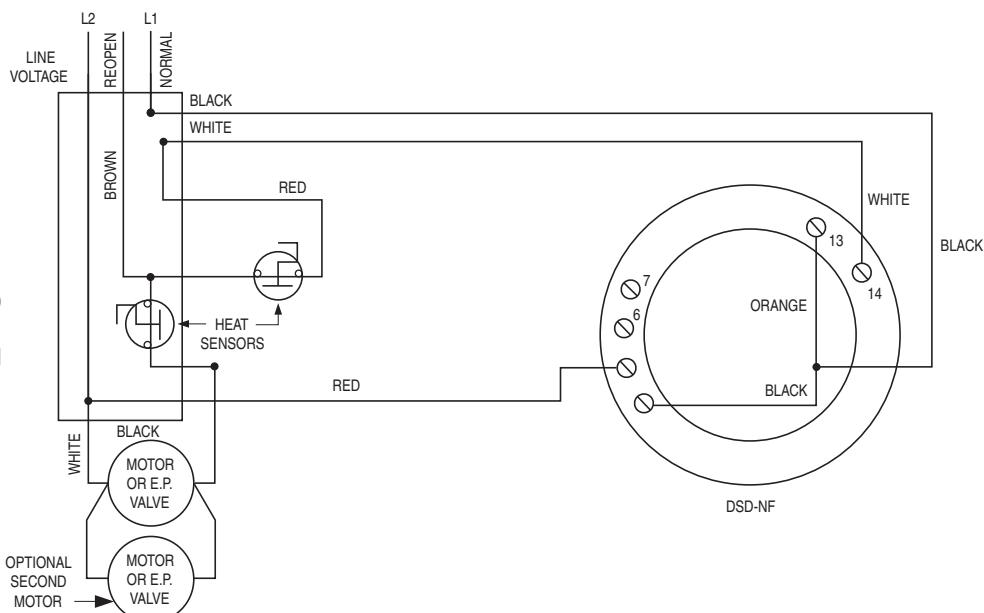


Figure 6: Combination Fire/Smoke damper with smoke detector and DTO (MLS-400) (includes MLS-300) (see IOM-MLS4 and IOM-MLS3H or IOM-MLS3N for wiring details).





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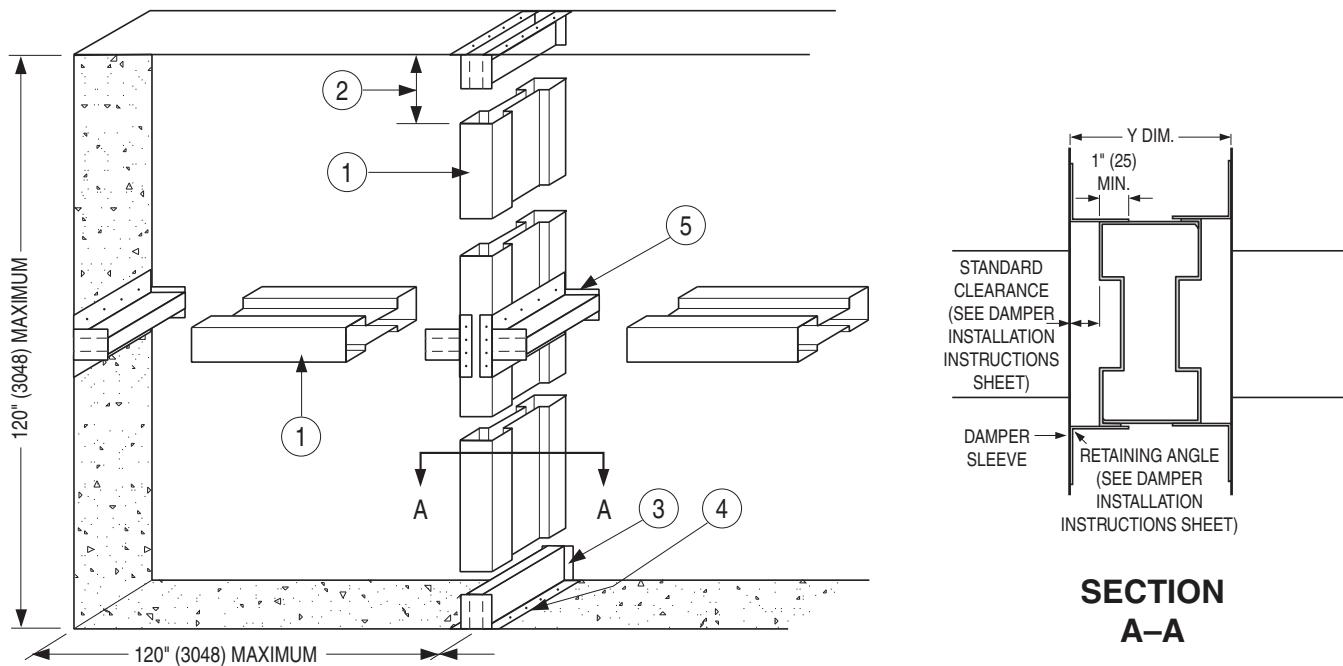
APPLICATION:

Fire dampers are UL/ULC Classified for their maximum size or maximum assembly size. Generic steel mullions can be used in static HVAC systems to separate vertically mounted 1 1/2 hour labeled galvanized steel fire dampers in vertical wall openings larger than maximum UL/ULC permitted multiple damper assembly size. Fire dampers must not exceed a maximum 120" (3048) height by unlimited width using vertical mullions every 120" (3048) max. Mullions are not intended to be part of the ductwork. (i.e. exposed to airflow).

Whenever the duct size exceeds the maximum damper width or height, the opening must be divided into two or more separate openings with a mullion installed between the damper sections. The mullion consists of a vertical and/or horizontal mullion and mullion caps. One cap for each end of the mullion.

The steel mullion is intended for use only in concrete block or poured walls with 7" (178) minimum and 12" (305) maximum thickness. Hollow concrete block walls are to be suitably filled with minimum 3500 psi concrete for proper securing of mullions.

Important Note: Steel mullions are for use in static systems only. UL/ULC does not acknowledge their use with dynamic fire dampers.


FABRICATION AND GENERAL INSTALLATION:

1. Fabricate mullions of 16 ga. (1.6) galvanized steel as shown in **Figure 1**. Two mullion pieces are joined with 3/16" (5) diameter steel pop rivets or 3/4" (19) long welds located 6" (152) maximum from each end and 12" (305) O.C. maximum.
2. The mullion should permit clearance between the mullion and top cap. Required clearance is 1/8" (3) per foot of wall opening height. Minimum permitted clearance is 1/4" (6). Maximum permitted clearance is 1 1/4" (32) (e.g. for an 8 ft. (2438) high opening the permitted clearance is 1/8" (3) x 8 = 1" (25) +).
3. Fabricate two caps for each mullion of 12 ga. (2.8) galvanized steel as shown in **Figure 2** for vertical and horizontal mullions. (Caps must permit mullion to overlap each cap by minimum 3" (76)). Cap height is calculated by adding 3" (76) to permitted mullion expansion clearance which is 1/8" (3) per foot of wall opening height. Insert mullion caps into mullion ends allowing mullion to float between the caps. Do not fasten mullion to caps in any way. Locate within opening to provide correct expansion clearance for dampers.
4. Drill holes in caps and concrete for anchoring steel mullion caps with 1/4" (6) – 20 x 5/16" (8) steel screws and 3/8" (10) diameter x 1" (25) concrete expansion anchors. The eight holes to secure the cap (**Figure 3**) are equally spaced, $X \div 8$ from both ends and 1/2" (13) inwards of each side.
5. Set horizontal mullion caps at vertical mullions as shown (**Figure 4**). If steel lintels are present, four 1" (25) welds (two per mullion cap leg) may be used to anchor each mullion cap.

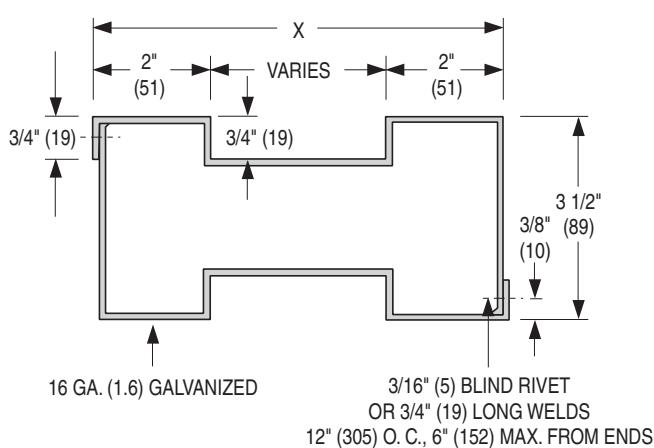


FIGURE 1
MULLION CROSS-SECTION

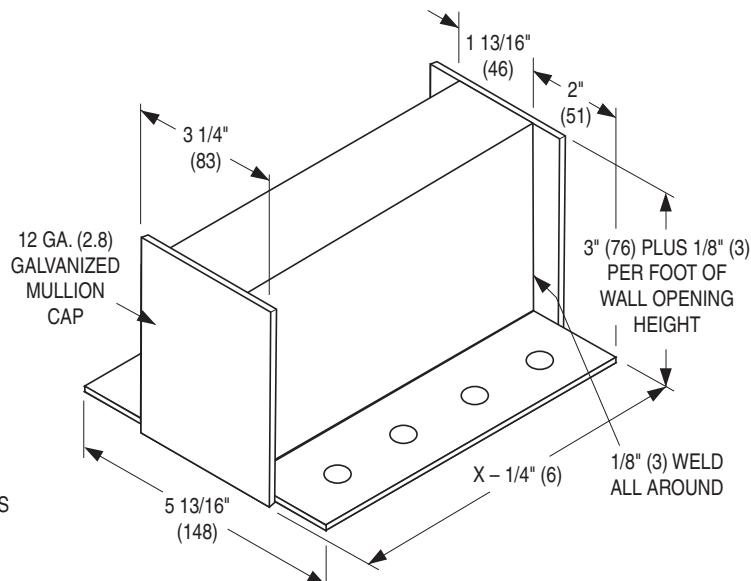


FIGURE 2

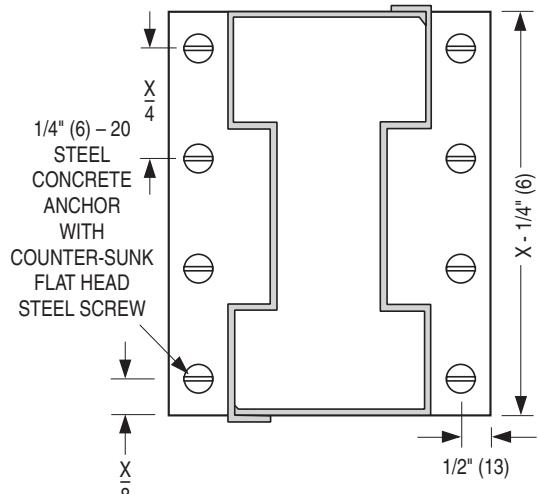


FIGURE 3

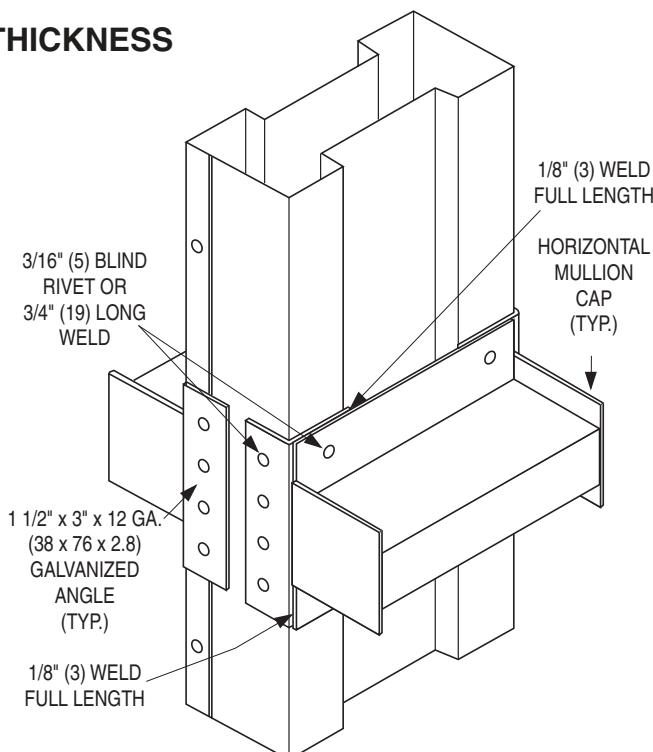


FIGURE 4



Refer to the UL or
ULC Classification
Marking on the
Product

These instructions
comply with Underwriters
Laboratories Safety
Standard 555.

Dimensions are in inches (mm).

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Detail 1A
Angle over
drywall.

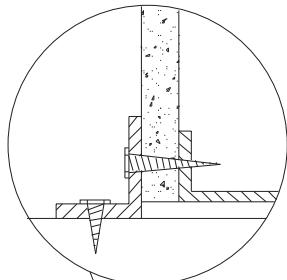


Figure 1
Metal Stud

Detail 1B
Angle under
drywall.

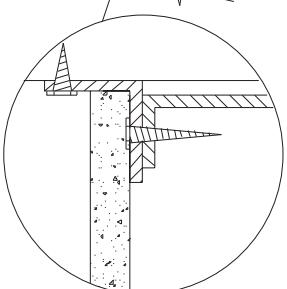


Figure 2
Wood Stud

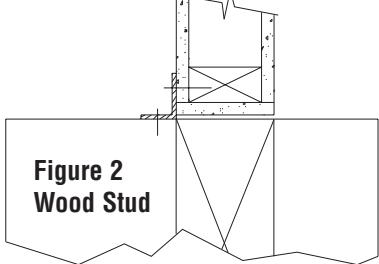
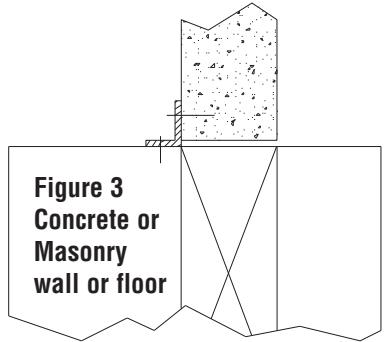


Figure 3
Concrete or
Masonry
wall or floor



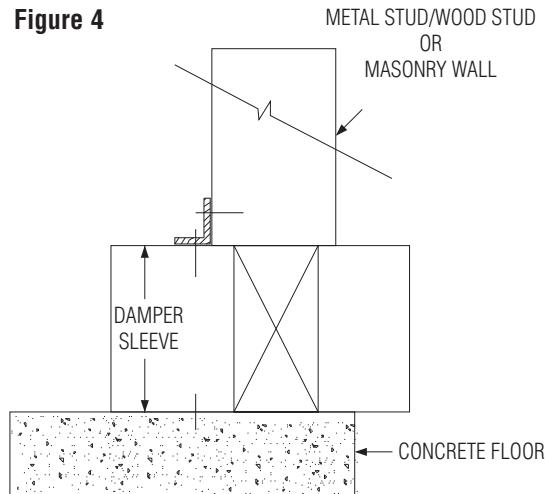
NOTES:

1. For the maximum sizes listed below, all Nailor 1 1/2 hour labeled curtain, multi-blade and combination fire/smoke dampers may be installed using single-side retaining angles in lieu of the conventional two-sided retaining angle method. Retaining angles may be field fabricated or factory supplied and may be installed in metal/wood stud or masonry walls and concrete floors.
2. Install dampers in accordance with the appropriate damper installation instruction sheet in conjunction with this supplement. Replace conventional two-sided retaining angles with single-sided retaining angles as appropriate. Retaining angles may be installed on either side for vertical partition installations, but must be installed on the top side for a floor installation. Retaining angles must be attached to both the sleeve and the wall or floor.
3. Retaining angles required on all four sides unless installed on top of a concrete floor slab (See Note 6).
4. Single-sided retaining angles shall be a minimum of 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.61) steel for metal stud, masonry walls or concrete floors. For wood stud partitions, retaining angles shall be a minimum of 2" x 1 1/2" x 16 ga. (51 x 38 x 1.61) steel. For metal stud partitions only, the single-side retaining angle may be directly attached to the metal stud prior to the installation of the drywall. See Detail 1B.
5. Attach the 1 1/2" (38) leg of the retaining angles to the damper sleeve using 1/2" (13) long welds, 1/4" (6) diameter bolts and nuts, 3/16" (5) diameter steel rivets or #8 sheet metal screws, 6" (152) o.c.. Secure the retaining angles to the structural members of a vertical drywall wall using drywall screws. In the case of wood stud construction (see Figure 2), the screws should be a minimum of 2 1/2" (64) long, with minimum 1 1/4" (32) penetration into framing. In the case of masonry walls or concrete floors (see Figure 3), use 1/4" (6) masonry anchors 1 1/2" (38) minimum length, with minimum 1 1/4" (32) penetration into wall or floor. All fasteners to be on a maximum of 12" (305) o.c. with a minimum of two fasteners per side, top, and bottom.
6. In the case where the damper sits directly on a concrete floor slab, the bottom retaining angle is not required if the damper sleeve is fastened directly to the slab using 1/4" (6) masonry anchors 1 1/2" (38) minimum length, with minimum 1 1/4" (32) penetration into the floor. All fasteners to be on a maximum of 12" (305) o.c. with a minimum of 2 fasteners (See Figure 4).



Refer to the UL or
ULC Classification
Marking on the
Product

Figure 4



7. No firestop caulking is required on this product.

Underwriters' Laboratories file # R9492.

Also conforms to NFPA 90A and NFPA 92.

Maximum sizes: 96" W x 36" H (2438 x 914) or
36" W x 96" H (914 x 2438).

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NOTES:

1. These details are based upon tests conducted by the Gypsum Association. Consult the local authority having jurisdiction for other acceptable framing methods.
2. Frame wall openings as shown in Figure 1 or 2.
3. Gypsum panels must be screwed to all stud and runner flanges, 12" (305) max. o.c. surrounding opening.
4. All fasteners to be per UL/ULC Classified wall design.
5. UL/ULC wood stud designs require gypsum wallboard filler pieces to be installed around entire opening, screwed 12" (305) o.c. to web of runners and studs, covering all wood stud surfaces.
- In UL metal stud designs, exposed steel surfaces need not be covered with gypsum wallboard. ULC metal stud construction however may still require filler pieces, check with the local authorities.
6. Refer to standard installation instructions sheet for additional details.

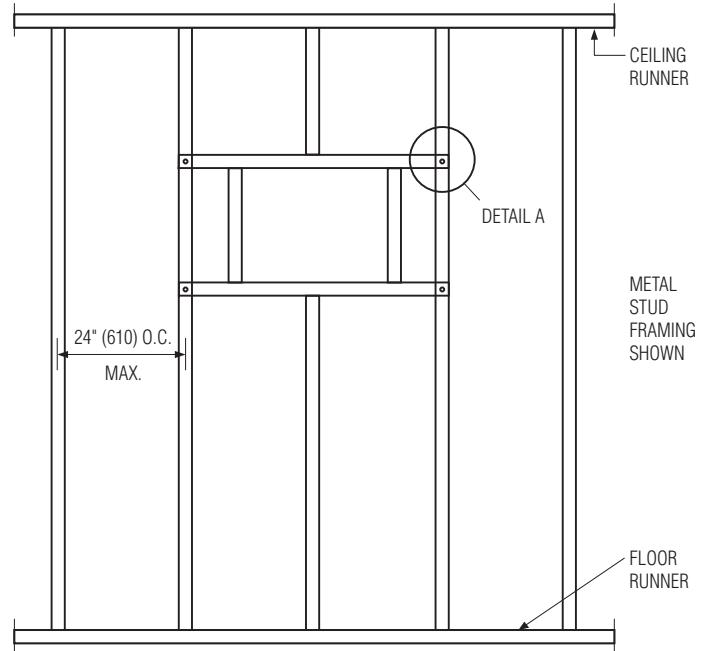


FIGURE 1. SINGLE VERTICAL STUD OPENING PREPARATION DETAILS.

DAMPERS UP TO 36" x 36" (914 x 914).

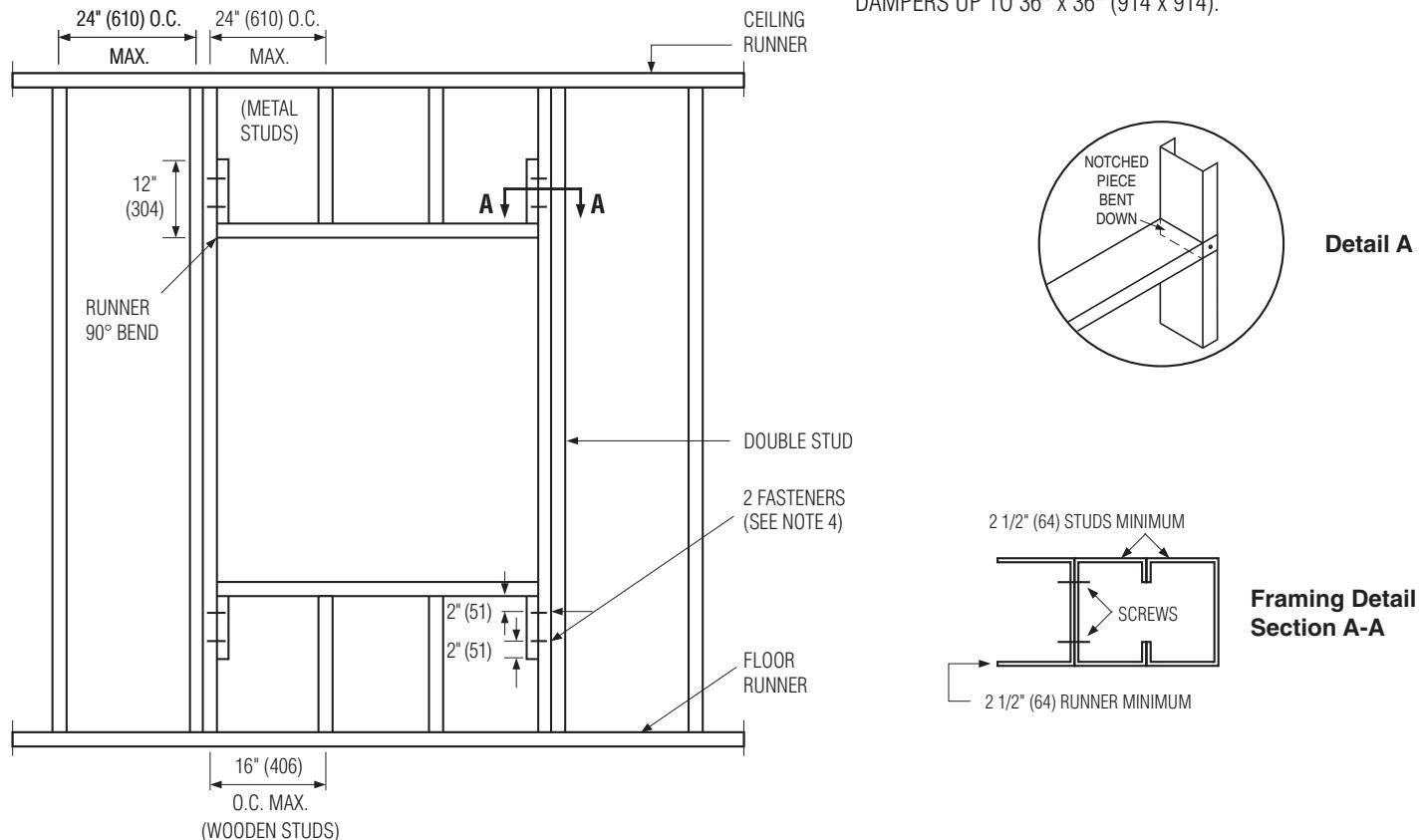
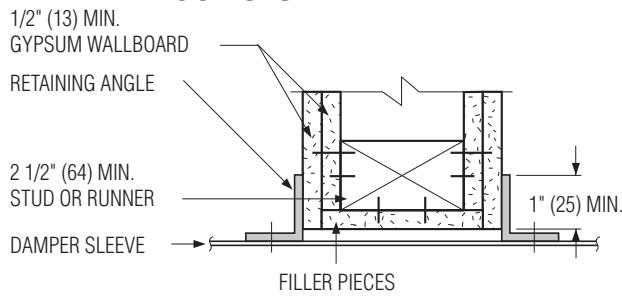


FIGURE 2. DOUBLE VERTICAL STUD OPENING PREPARATION DETAILS.

DAMPERS OVER 36" x 36" (914 x 914).

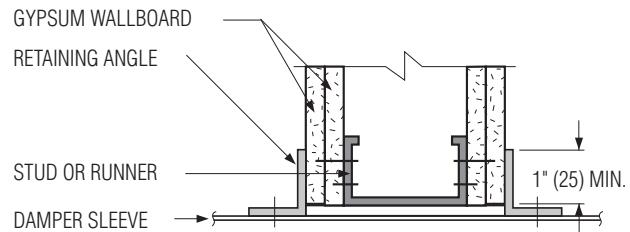
TYPICAL STUD WALL DETAILS (See Notes on Page 1)

WOOD STUD DETAIL

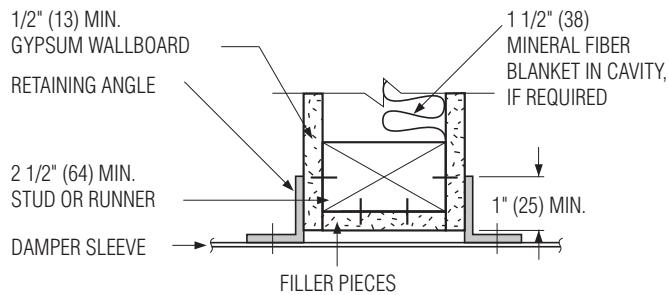


2 Hour Partition Rating

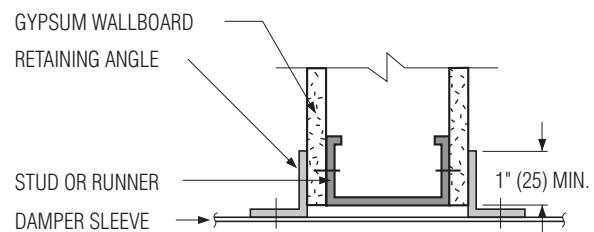
METAL STUD DETAIL (UL DESIGN)



2 Hour Partition Rating



1 Hour Partition Rating



1 Hour Partition Rating

Dimensions are in inches (mm).

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APPLICATION:

This vertical fire damper installation is for metal stud framing in UL resistant cavity shaftwall designs (1 and 2 hr.) including design Nos. U415 Systems A to F, U438, U469, U497 and U499. It differs from conventional fire damper installations in that it requires retaining angles on one side of the wall only, which are fastened to the wall as well as the damper for opening sizes up to 48" W x 36" H (1219 x 914). Larger openings require retaining angles on both sides.

GENERAL INSTALLATION:

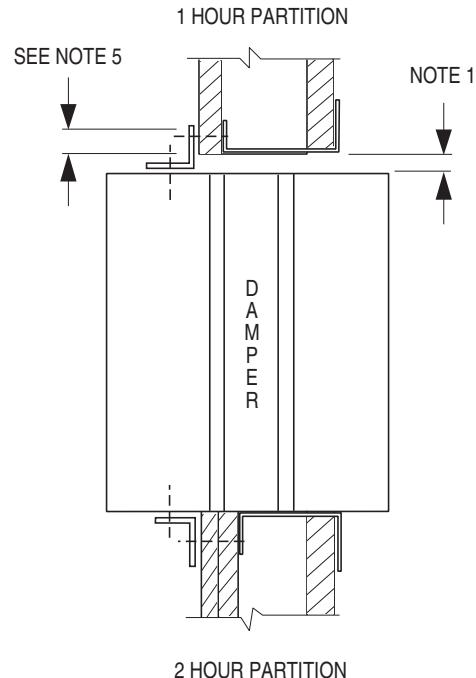
1. **Expansion Clearance:** Opening in wall shall be a minimum 1/8" (3) per linear foot larger than overall size of damper and sleeve assembly in either dimension. Maximum opening not to exceed 1/8" (3) per foot plus two inches. Opening shall not be less than 1/4" (6) larger for any size damper and sleeve assembly.
2. **Damper Sleeve:** Sleeve gauge shall be at least equal to the gauge of the duct as defined by the appropriate SMACNA duct construction standard and described in NFPA 90A when one or more of the following duct-sleeve connections are used (TDC/TDF breakaway, ductmate breakaway, plain "S" slip, hemmed "S" slip, standing "S" slip, reinforced standing "S" slip, inside slip joint, and double "S" slip.)

In addition, the following connections are acceptable:

- A. On rectangular duct, a standing S slip connection, with two #10 sheet metal screws on each side and bottom of the joint and with duct sealant* applied to each connection, may be used.
- B. On rectangular duct, a standing S slip connection on top and bottom joints and flat drive connections on side joints with duct sealant* applied to each connection, may be used for dampers 48" x 20" (1219 x 508) and smaller. Plain S and hemmed S slip connections can also be used in lieu of the standing S connections described above.
- C. A round duct may be attached to the round adapter which is part of the damper sleeve in the following manner:
 - (a) Duct diameters 22" (559) and smaller must use three #10 sheet metal screws equally spaced around the circumference and with duct sealant* applied to the connection.
 - (b) Duct diameters over 22" (559) up to and including 36" (914) may use five #10 sheet metal screws equally spaced around the circumference and with duct sealant* applied to the connection.
 - (c) Duct diameters larger than 36" (914) wide or diameter may use eight #10 sheet metal screws equally spaced around the circumference.

*The duct sealant must be PA2084T Duct Sealant Adhesive as manufactured by Precision or water based DP1010 by Design Polymetrics.

3. If any other duct-sleeve connections are used, sleeve shall be minimum of 16 gauge (1.6) for dampers up to 36" w x 24" h (914 x 610) and 14 gauge (1.9) if damper width exceeds 36" (914) or height exceeds 24" (610).
4. **Damper/Sleeve Attachment:** Damper shall be secured to sleeve with 1/4" (6) long welds, 3/16" (5) steel rivets, 1/4" (6) bolts and nuts, #8 sheet metal screws, or 3/16" (5) buttonlocks on both sides at 6" (152) on center and 2" (51) maximum from the corner of the damper on all four sides. For field assembled sleeves, the inner dimensions of the sleeve shall be equal to the outer dimensions of the damper.



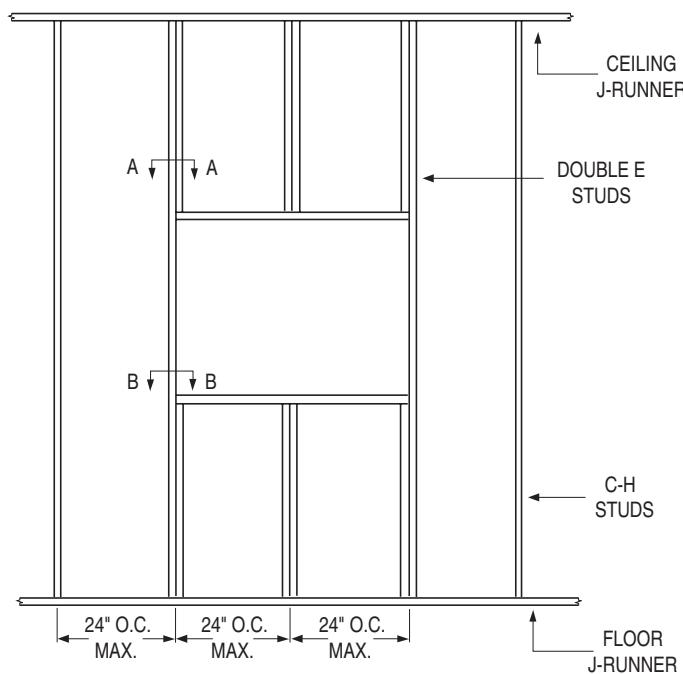
5. Retaining Angles:

- A. Shall be a minimum of 1 1/2" x 1 1/2" x 16 gauge (38 x 38 x 1.61) and fastened with #10 bolts or screws, 1/2" (13) long welds, or 3/16" (5) rivets to sleeve at a maximum spacing of 8" (152) O.C. and not more than 2" (51) from each end with a minimum of two connections on each side, top and bottom (See Illustration).
- B. Nailor 'Quick-Set' Retaining Angles can be used in lieu of conventional mounting angles. Retaining angles must overlap the structural opening by 1" (25) minimum.
- C. Retaining angles screw to wall with #10 screws. Use a minimum of two fasteners per side, top and bottom 12" (305) O.C. maximum.
6. See framing detail on next page for opening preparation. Refer to the appropriate installation supplements for the following requirements:

Ductmate Breakaway Connection	Doc. FDDMINST
Flange System Breakaway Connections	Doc. FDTDCFINST
'Quick-Set' Retaining Angles.	Doc. FDQSRA

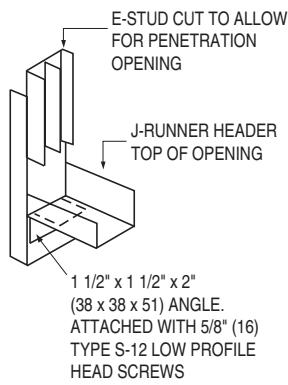


FRAMING DETAIL FOR ASSEMBLIES (U415 SYSTEMS A TO F, U438 AND U469)

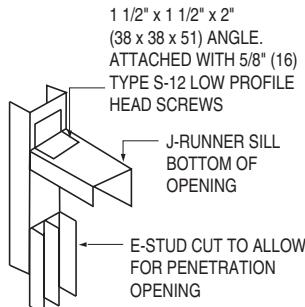


NOTE:

U438 shaftwall construction may alternatively utilize E shaped steel studs.

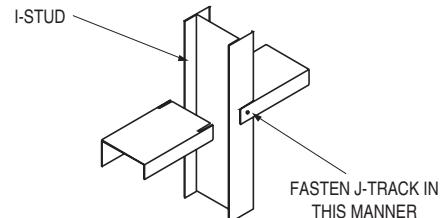
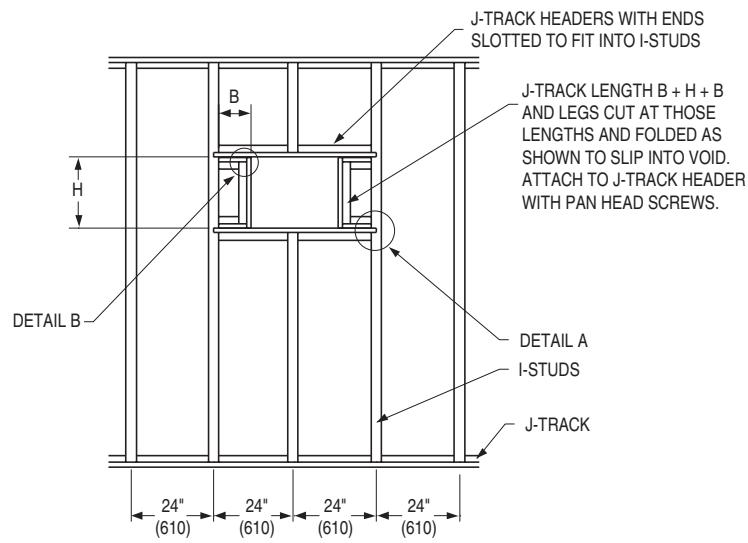


SECTION A-A

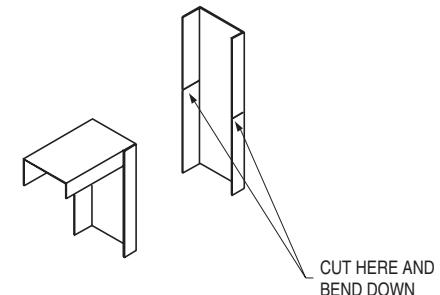


SECTION B-B

FRAMING DETAIL FOR ASSEMBLIES (U497 AND U499)



DETAIL A



DETAIL B

NOTE:

Shaftwall construction may alternatively utilize C-H or C-T shaped steel studs.

Dimensions are in inches (mm).

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FIRE DAMPER INSTALLATION SUPPLEMENT FLANGED TYPE ALTERNATE BREAKAWAY CONNECTIONS

These instructions provide details for an alternate breakaway connection between a fire damper or combination fire smoke damper sleeve and an adjoining duct. This alternate connection is classified with U.L. under the certification of the damper. These instructions apply to a connection using a manufactured add-on flange system by Ductmate, Ward, or Nexus and a TDC or TDF roll-formed flange system. These connections allow for both the use of the same flange type or the combining of mixed flange types. The following instructions depict the use of metal or plastic cleats and bolted or non-bolted corners:



Classifications filed at U.L under Listing # R9492

1. Install the manufactured flange system onto the damper sleeve or duct per the manufacturer's instructions.
2. To seal the two flange systems together, Neoprene or Butyl gasketing may be applied between the mating surfaces.
3. Align the two flange systems together. An optional 3/8" (9) bolt may be used in the corners to help with the alignment. These bolts do not have to be removed.
4. Install the cleat or #10 tek screw approximately equally spaced, per the following schedule:
 - Width or height less than 24" (610); use one cleat or screw per side
 - Width or height 24" (610) to less than 36" (914); use 2 cleats or screws per side
 - Width or height 36" (914) to less than 54" (1372); use 3 cleats or screws per side
 - Width or height 54" (1372) to less than 72" (1829); use 4 cleats or screws per side
 - Width or height 72" (1829) or greater; use 5 cleats or screws per side

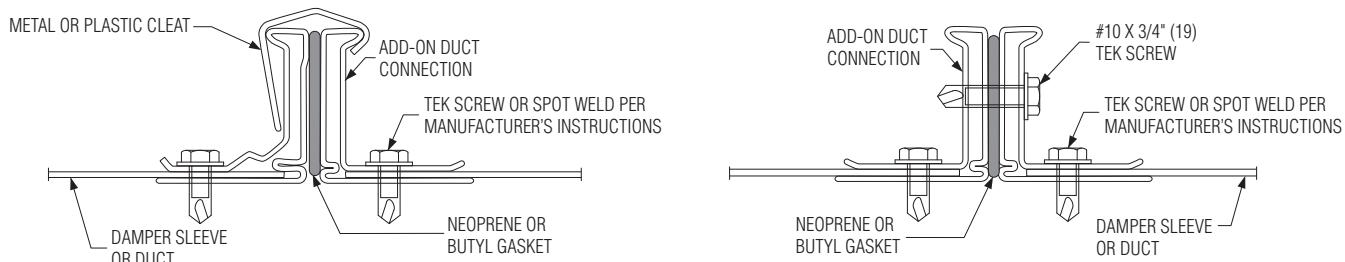


FIGURE 1. ADD-ON/ADD-ON

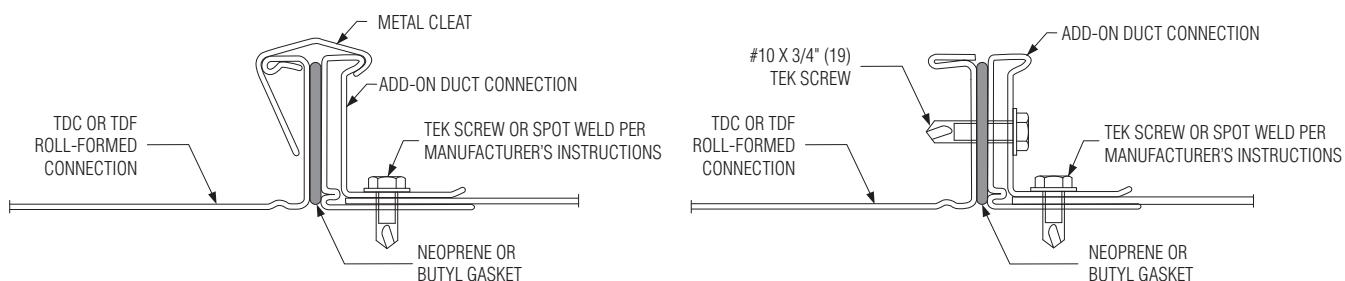


FIGURE 2. ROLL-FORMED/ADD-ON

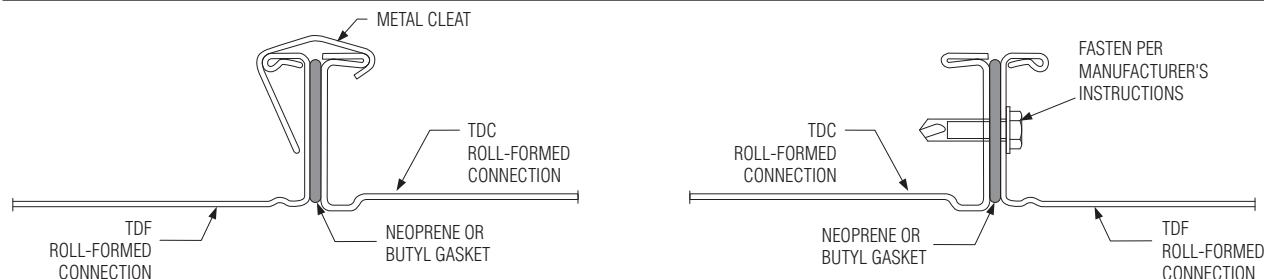


FIGURE 3. ROLL-FORMED/ROLL-FORMED

Dimensions are in inches (mm).

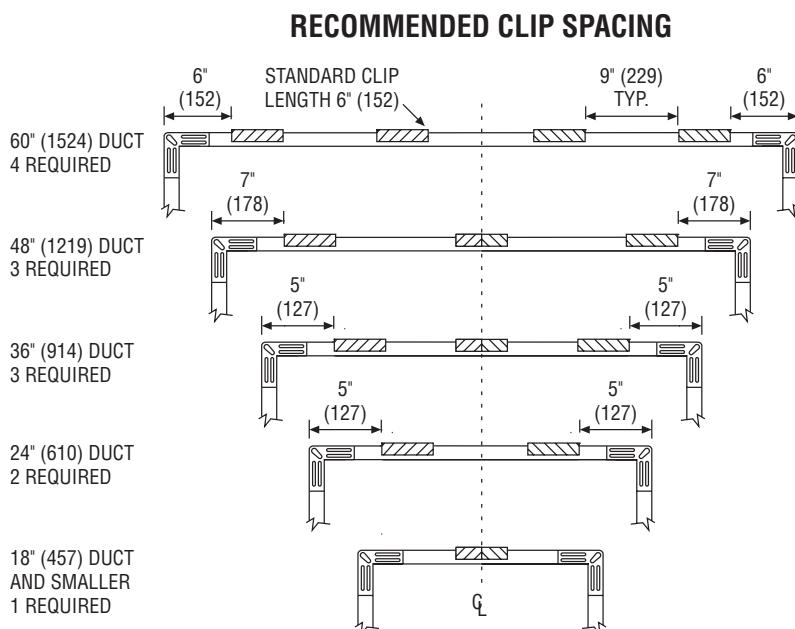
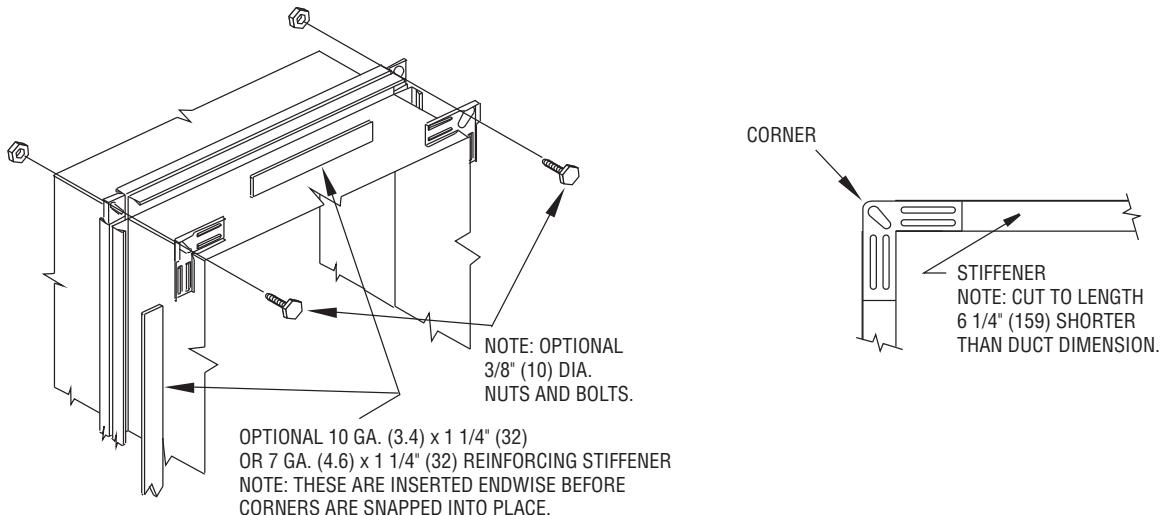


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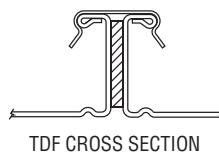
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CLEAT DETAILS



APPLICATION:

TDC (by Lockformer) and TDF (by Engle) are approved as breakaway connections for joining the fire damper sleeve and the duct. The slip joints shown in standard installation instructions for curtain type fire dampers, multi-blade fire dampers and combination fire/smoke dampers may be replaced by one of these systems.

INSTALLATION:

TDC and TDF roll-formed 4-bolt flanged connections assembled per the manufacturers instructions using gaskets, metal cleats 6" (152) long with spacing as shown and four 3/8" (9.5) metal nuts and bolts. See also the TDC or TDF addendum to the SMACNA Duct Construction Standards.

Damper Type	Max. Size		No. Cleats Per Side
	(inches)	(mm)	
Curtain	18 x 18	457 x 457	1
	24 x 24	610 x 610	2
	48 x 48	1219 x 1219	3
	60 x 60	1524 x 1524	4
Multi-Blade	18 x 18	457 x 457	1
	24 x 24	610 x 610	2
	36 x 48	914 x 1219	3



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SUPPLEMENTARY INSTALLATION INSTRUCTIONS "QUICK-SET" RETAINING ANGLES FOR ALL SLEEVED FIRE AND COMBINATION FIRE/SMOKE DAMPERS

"QUICK-SET" RETAINING ANGLES BOTH SIMPLIFY AND SPEED INSTALLATION, SAVING BOTH TIME AND MONEY.

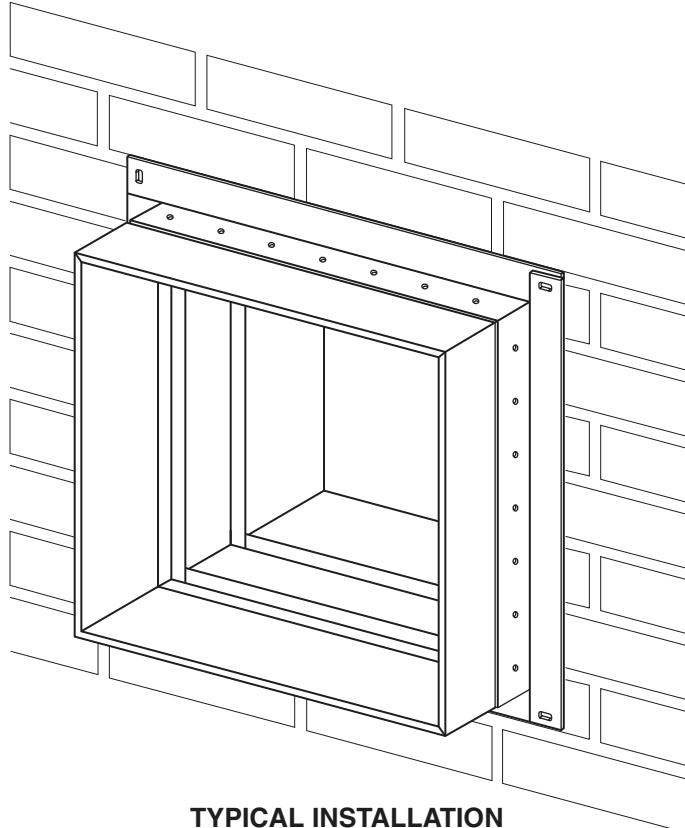
BENEFITS:

- One piece angles are fastened together in the corners. Only two sets of angles to handle per damper (rather than four separate angles per side).
- Angles are shipped with damper - no sorting or matching.
- Provided with pre-drilled fastening holes on 2" (51) centers to ensure correct angle/sleeve attachment.
- Factory fabricated by Nailor to suit the individual fire damper.
- Reduced cost when compared to conventional retaining angles.
- Dampers can ship directly to the job site complete with all necessary installation sheet metal hardware (saves on double handling at contractor's shop).
- Help ensure a correct installation as per U.L. approved installation instructions.

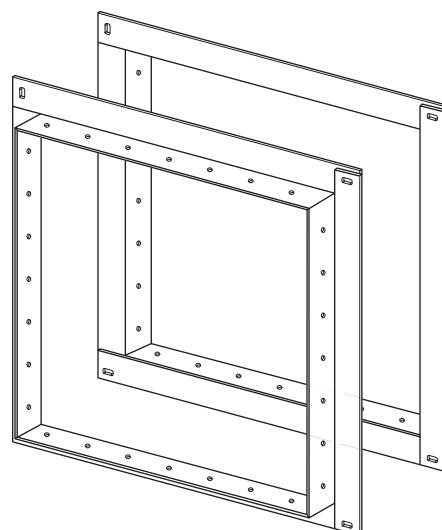
The majority of installing contractors view fire damper installation as a costly time consuming and troublesome procedure. Eight conventional angles must be custom fabricated for each damper either in a sheet metal shop or at the job site and sized to suit each individual damper. Invariably, they are mislaid or lost and must be matched to each factory supplied damper.

The Nailor "Quick-Set" solution solves the majority of problems. They are pre-formed to fit and ship with the individual damper for ultimate convenience. "Quick-Set" angles are supplied with correctly spaced pre-drilled screw-holes to ensure a quick, easy and accurate installation for all integral sleeve Nailor fire and combination fire/smoke dampers - no measuring required.

"Quick-Set" retaining angles provide the "complete" installation package. Simple, fast, convenient.



TYPICAL INSTALLATION



TYPICAL PAIR OF PRE-ASSEMBLED
'QUICK-SET' RETAINING ANGLES

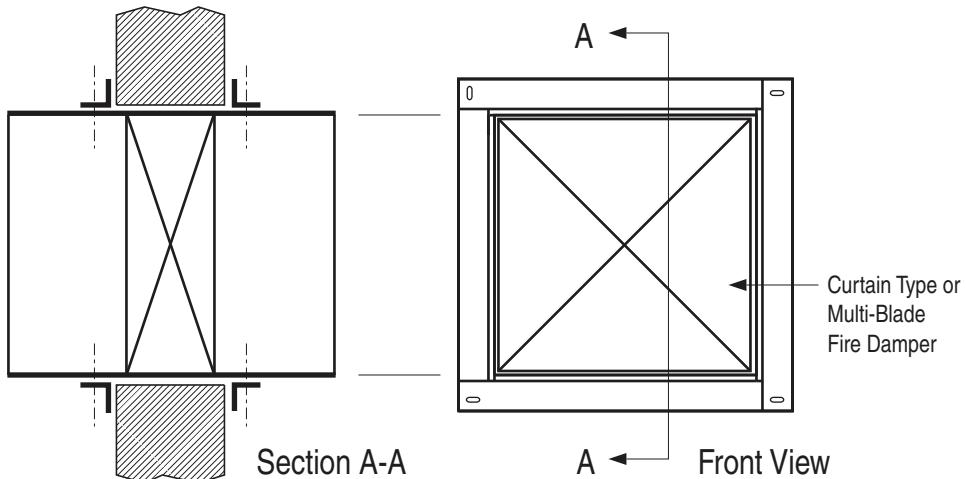


FIGURE 1. TYPICAL TWO SIDED INSTALLATION.

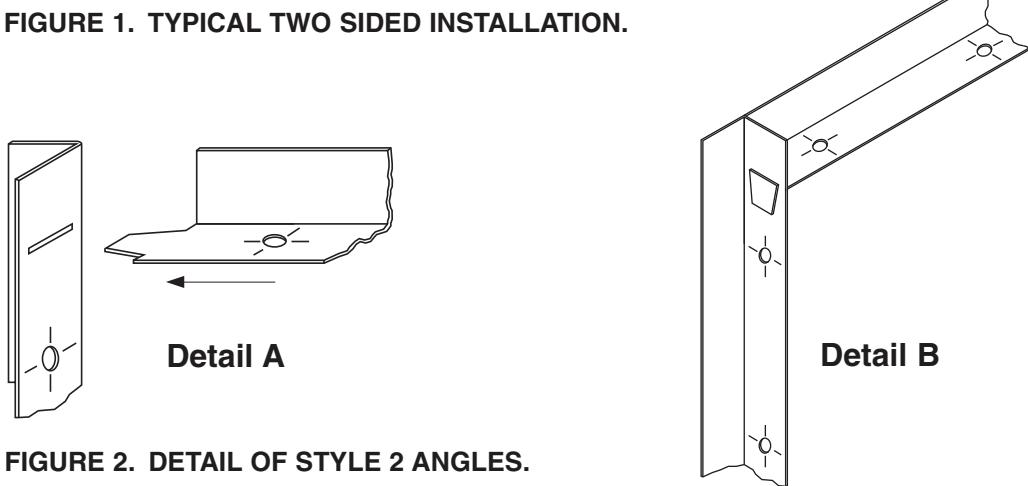


FIGURE 2. DETAIL OF STYLE 2 ANGLES.

APPLICATION:

The Nailor Quick-Set Retaining Angle System may be used in lieu of conventional retaining angles on all Nailor Fire and Combination Fire / Smoke Dampers.

Quick-Set angles are supplied in one of two styles, dependent upon fire resistance label, damper size and installation method.

Style 1: 1 1/2" x 1 1/2" x 20 ga. (38 x 38 x 1.0) Four sides are connected together with rivets in three corners.

Standard for the majority of applications with the following limitations:

- 1 1/2 hour label fire dampers
- Maximum Size: 36" x 36" (914 x 914)
- Two sided installation only



Refer to the UL or ULC Classification marking on the product.

Dimensions are in inches (mm).

Style 2: 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) Slot and tab design. The retaining angle assembly for each side has four angles, each with a tab end and a slot end (Detail A). The tabs are to be inserted into the slots and knocked down either before or after fastening to the sleeve (Detail B).

- 1 1/2 or 3 hour label fire dampers
- Maximum Size: 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286)
- Single side (1 1/2 hour only. Refer to Single Side Retaining Angles Supplementary Installation Instructions for size limitations) or two sided installation

Refer to the Following Installation Instructions:

Curtain Type Fire Dampers (D)0100 & (D)0500	FDINST
Curtain Type Fire Dampers 0200 & 0500 Thinline	FDTINST
Multi-Blade Fire Dampers 1200 & 1250	MBFDINST
Combination Fire/Smoke Dampers 1220	1220INST
Combination Fire/Smoke Dampers 1270	1270INST
Single Side Retaining Angles	FDSSRAINST

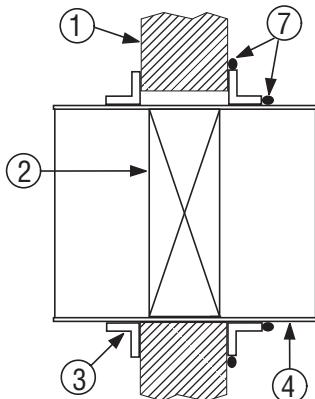


Figure 1. Damper ducted both sides.

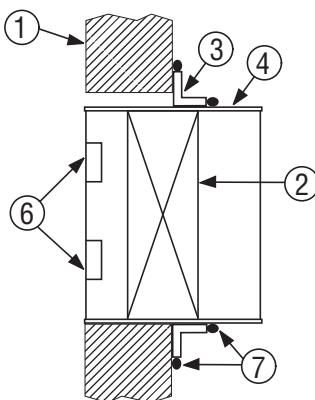


Figure 2. Damper sleeve with tabs for grille mounting

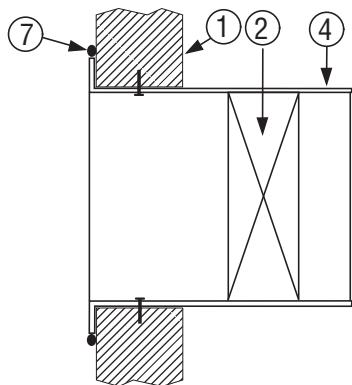


Figure 3. Out of Wall damper with flanged sleeve for grille mounting

APPLICATION:

Application of sealant between the retaining angles, retaining plates, or sleeve retaining flange and the fire rated wall or floor as applicable to the damper installation is not required by UL as a standard procedure. However, if an airtight seal is required by specification or local building code, sealant shall be applied as shown.

METHOD

Follow the sealant manufacturers' directions; remove dirt, grease, and moisture from the surfaces to be sealed. Apply a continuous bead of Dow Corning RTV732, Hilti Corporation FS-One, Nuco Inc. Self-Seal GG-200, Johns Manville Firetemp C1 or GE RTV108 sealant. Location of sealant should be as shown in Figures 1 through 4 and may be applied on one or both sides of the fire separation, as applicable to the model specific installation.

IMPORTANT:

Do not apply sealant within the required expansion gap between the damper and the fire rated wall or floor.

Press the surface of the sealant in place to dispel any air. Allow sealant to set and become tack-free before operating the damper.

Refer to the appropriate damper installation instructions for details on damper installation.

ITEMS

1. Fire Rated Wall or Floor
2. Damper
3. Retaining Angles
4. Sleeve
5. Retaining Plate
6. Mounting Tabs
7. Sealant (refer to text for specific sealant)

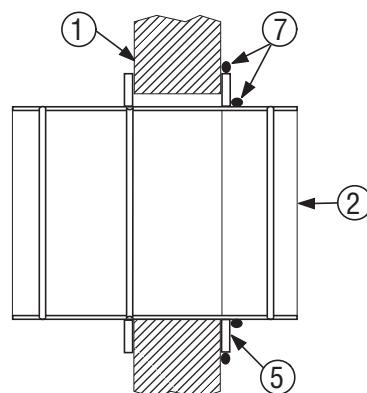


Figure 4. Round damper

Dimensions are in inches (mm).



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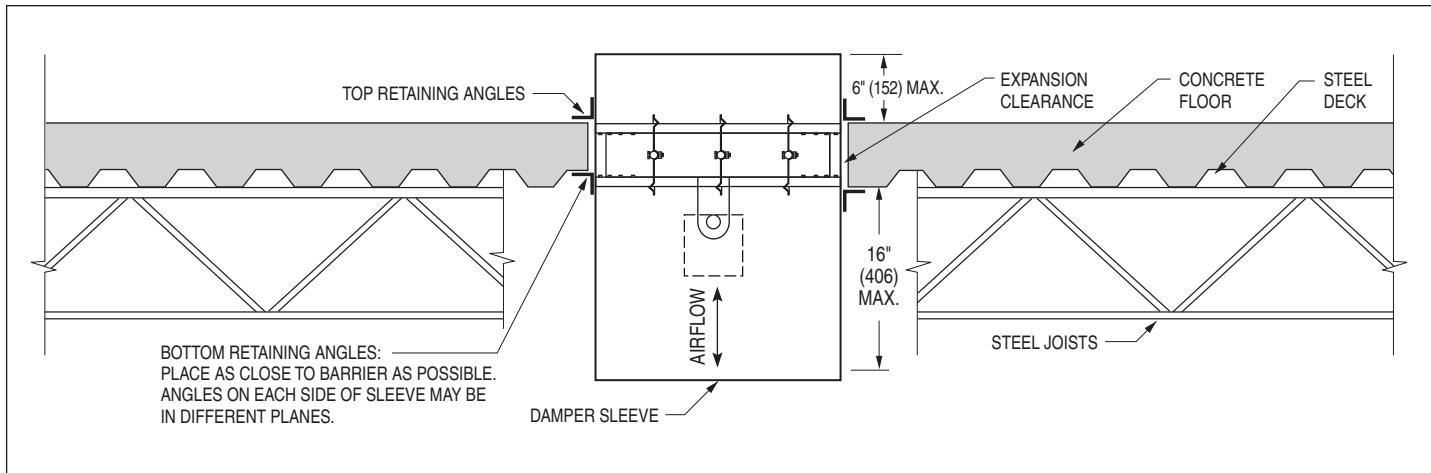


Fig. 1. Floor Opening Detail.

APPLICATION:

Horizontal installation of fire and combination fire/smoke dampers in concrete floors utilizing a steel deck may not allow the bottom angles to be placed against the steel deck on an even plane. This installation details how to properly install the required angles next to the steel deck.

NOTES:

1. Retaining angles are required on top and bottom sides of the damper as detailed in the damper installation instructions for the specific model. Angles may be reversed so that one leg of the angle points into the floor opening provided the required clearance is maintained between angle leg fasteners and the floor opening.

Important: When positioning damper in floor and attaching retaining angles to sleeve, ensure fasteners clear and do not penetrate damper frame. Failure to do so may prevent correct damper operation or closure due to fouling of linkage or damper blades.

2. Installation of the bottom angle against the uneven steel deck shall be done so the angles on each side of the sleeve are as close to the barrier as possible. The angles may be in different planes relative to each other (see Figures 1 and 2).
3. When viewed from the end of the sleeve, the angles must overlap each other in the corners to prevent "see through".

Refer to the Following Installation Instructions:

Curtain Type Fire Dampers (D)0100 & (D)0500	FDINST
Curtain Type Fire Dampers 0200 & 0500 Thinline	FDTINST
Multi-Blade Fire Dampers 1200 & 1250	MBFDINST
Combination Fire/Smoke Dampers 1220	1220INST
Combination Fire/Smoke Dampers 1270	1270INST

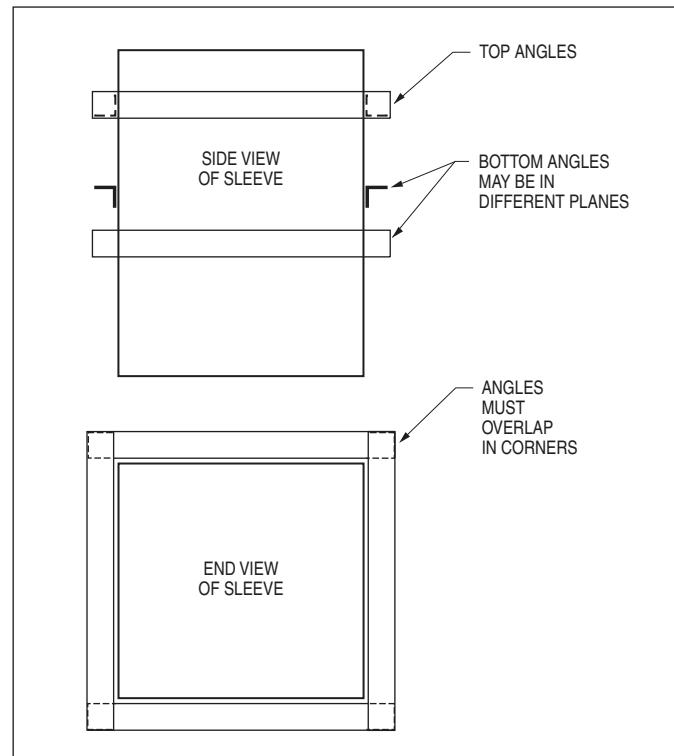


Fig. 2. Retaining Angle Detail



Refer to the
UL Classification
Marking on the
Product

Dimensions are in inches (mm).



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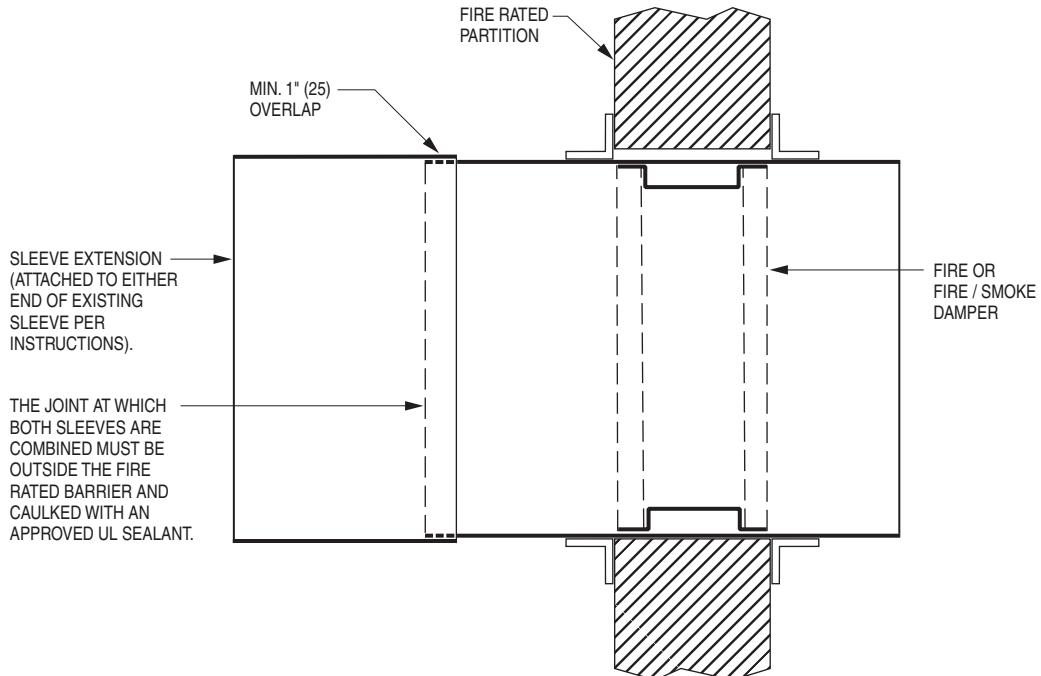


Figure 1. Sleeve Extension Detail

APPLICATION:

Factory installed sleeves may sometimes need to be extended in the field when of insufficient length for ductwork connection relative to the depth of the fire partition. This supplement installation instruction provides details for attachment of the sleeve extension. Consult Authority Having Jurisdiction for approval.

NOTES (Refer to Figure 1):

1. Sleeve extension must be same material and gauge as factory sleeve.
2. The inside dimensions of the sleeve extension must be the same dimensions as the outside dimensions of the factory sleeve.
3. Sleeve extension must overlap the factory sleeve a minimum of 1" (25).
4. All four sides of the sleeve extension must be attached to the factory sleeve. Attachments must be spaced a maximum of 6" (152) on center and a maximum of 2" (51) from corners. A minimum of 2 attachments per side (8 per damper) are required. Attach the sleeve extension using 1/2" (13) long tack or spot welds, #10 sheet metal screws, 1/4" (6.35) dia. bolts and nuts or 3/16" (5) steel pop rivets.
5. Products with a smoke leakage rating require that the joint between the two sleeves be sealed with a continuous 1/8" (3) bead of GE RTV108 or Dow Corning RTV732 silicone sealant.

6. Sleeve extensions can be made to either end of the factory sleeve. However, the sleeve cannot extend beyond the fire partition more than 6" (152) on either side or 16" (406) on one side if equipped with an actuator or integral access door.
7. The joint created by the factory sleeve and sleeve extension cannot be in the plane of the partition.

Refer to the Following Installation Instructions:

Curtain Type Fire Dampers (D)0100 & (D)0500	FDINST
Curtain Type Fire Dampers 0200 & 0500 Thinline	FDTINST
Multi-Blade Fire Dampers 1200 & 1250	MBFDINST
Combination Fire/Smoke Dampers 1220	1220INST
Combination Fire/Smoke Dampers 1270	1270INST



Refer to the
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Dimensions are in inches (mm).



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These instructions are for installing vertical mount fire and combination fire smoke dampers in a fire resistant ventilation duct (UL Ventilation duct Assembly HNLN.V-5).

NOTES:

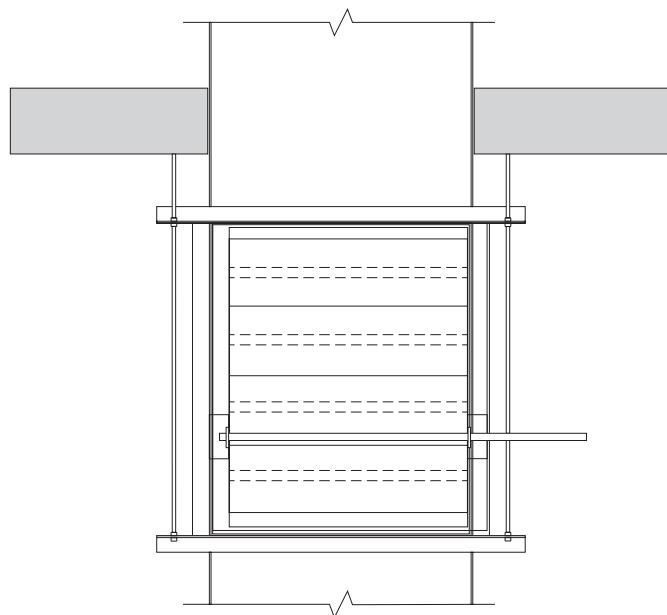
1. The damper sleeve must slip inside the fire resistant duct spool. Damper sleeve assembly will be 1/4" (6), 1/2" (13) maximum, smaller than duct spool size.
2. Damper is to be supplied with factory mounted sleeve. Sleeve gauge will be minimum of 16 ga. (1.5) for dampers up to 36" wide x 24" high (914 x 610) and 14 ga. (2) for dampers exceeding 36" wide x 24" high (914 x 610).
3. Mounting angles need to be the following sizes:
 - 1 1/2" x 1 1/2" x 1/4" up to 24" (38 x 38 x 6 up to 610)
 - 2" x 2" x 1/4" over 24" up to 32" (51 x 51 x 6 over 610 up to 813)
 - 2 1/2" x 2 1/2" x 1/4" over 32" up to 40" (64 x 64 x 6 over 813 up to 1016)
 - 3" x 3" x 1/4" above 40" (76 x 76 x 6 above 1016)
4. Mounting angle fasteners:
 - #10 bolts or screws
 - 3/16" (4.7) steel rivets
 - 1/2" (13) long welds
5. Mounting Angle Fasteners Spacing:
 - Mounting angles to dampers, space fasteners on 6" (152) on center.
 - Mounting angle to spool flange, space fasteners on 12" (305) on center.
 - Minimum 2 fasteners per side
6. Hanger rods:

3/8" (10) threaded rod anchored to the floor above and attached to the mounting angles through hole in the angles and secured with hex nut and washer (items 5 & 6). Anchor to masonry per assembly No. V-5.
7. Duct to Damper Sleeve Connection:

See the fire damper or the combination fire smoke installation instructions for breakaway, flanged, or non-breakaway connections.

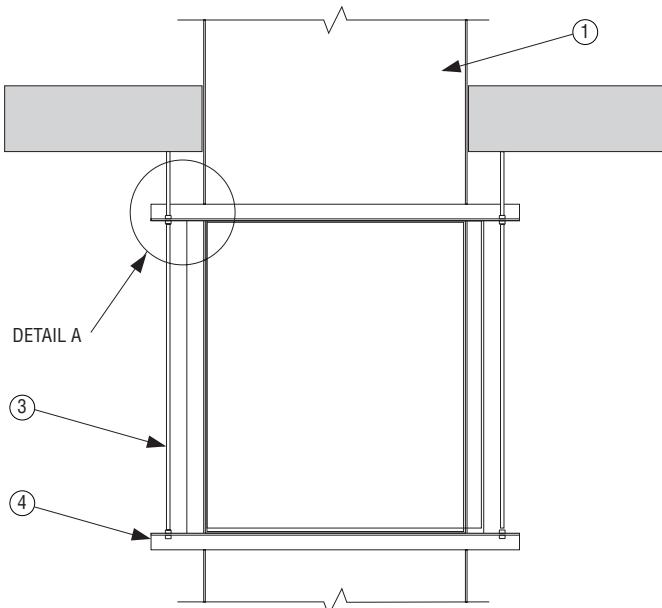


Refer to the UL or
ULC Classification
Marking on the
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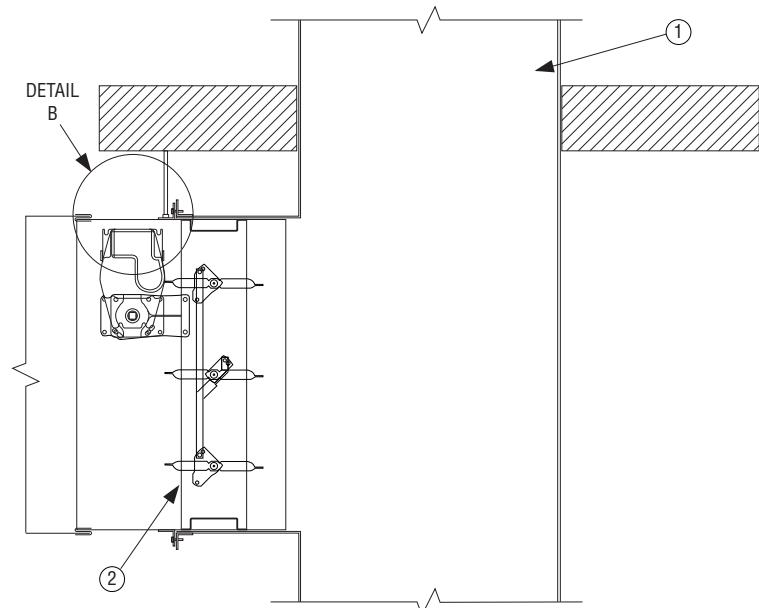


END VIEW

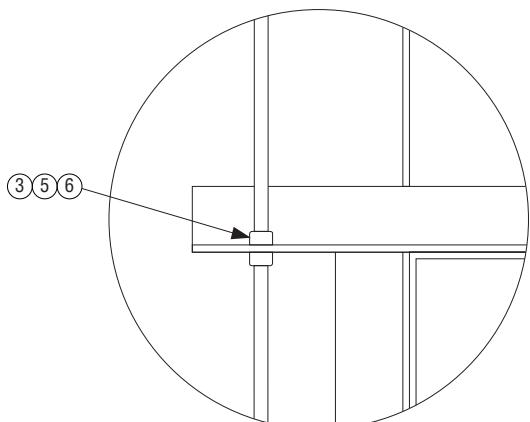
Item	Description
1	Fire Resistant Ventilation Duct (UL HNLN Assembly No. V-5)
2	Fire Damper or Combination Fire/Smoke Damper
3	Hanger rods in accordance with assembly No. V-5
4	Mounting angles (see instruction #3)
5	3/8" (10) hex nuts
6	3/8" (10) flat washer
7	Mounting angle fasteners (see instruction #4)



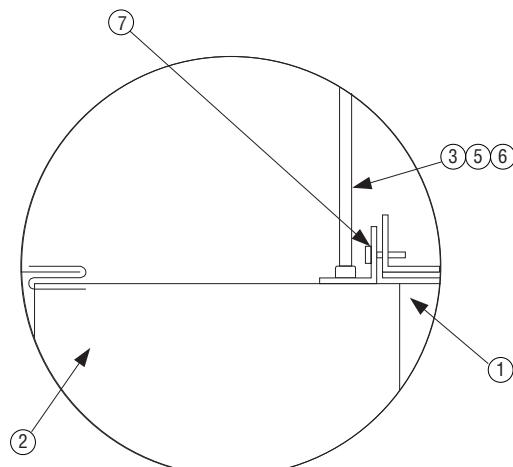
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SIDE VIEW



DETAIL A



DETAIL B

Dimensions are in inches (mm).

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NOTES:

1. These instructions meet the requirements of UL 555 and apply to 1-1/2 hour rated combination fire smoke dampers and fire dampers mounted in masonry, block, or metal stud walls. This installation method may also be utilized in wood stud walls in applications where the angle on the bottom side of the damper is omitted. Specific requirements in these instructions are mandatory.

The installation shall comply with the requirements of NFPA 90A (Standard for the Installation of Air Conditioning and Ventilating Systems) and UL File R9492.

Maximum Damper Size

Dampers up to the following sizes may utilize this installation method:

Installations omitting the retaining angle from the top of the damper

- 36" wide x 48" high (914 x 1219)

Installations omitting the retaining angle from the bottom of the damper

- 96" wide x 36" high (2438 x 914)
- 36" wide x 96" high (914 x 2438)

2. Expansion Clearance Requirements

On the side of the damper without a retaining angle there shall be no expansion clearance between the damper sleeve and wall opening.

On the three sides of the damper that do have a retaining angles there are no minimum clearance requirements between the wall opening and the damper sleeve. However, to facilitate installation, clearances between the wall opening and the damper sleeve are recommended.

3. Retaining Angle Requirements

Installations utilizing this method only require retaining angles on one side of the wall.

When using the installation method described in this supplement retaining angles are only required on three of the four sides of the damper.

4. Requirements For Side Without Retaining Angle

A) In the case where the damper sits directly on a concrete floor slab, the bottom retaining angle is not required if the damper sleeve is fastened directly to the slab using 1/4" (6) masonry anchors 1 1/2" (38) minimum length, with minimum 1 1/4" (32) penetration into the floor. All fasteners to be on a maximum of 12" (305) o.c. with a minimum of 2 fasteners.

B) When the retaining angle is omitted from the top of the damper the following requirements apply:

- The damper shall be shimmed tight up against the top of the wall opening.
- On the top side of the damper sleeve fasteners shall be run up through the sleeve into the steel stud or block wall. For steel stud walls fasteners shall be #10 x 1 1/2" (38) sheet metal screws. See **Figure 2**. For masonry or block walls fasteners shall be 1/4" x 1 1/2" (6 x 38) self-tapping concrete screws.
- Fasteners shall be no more than 2" (51) from the corners and then a maximum of every 3" (76) on center.

5. Requirements For Sides With Retaining Angles

Retaining angles for dampers must be a minimum of 20 ga. (1.0). The leg of the retaining angle on the damper sleeve shall be a minimum of 1 1/4" (32). It is acceptable for the retaining angles to be installed either such that the leg on the sleeve goes away from the wall or in towards the wall. The leg of the retaining angle on the wall shall be long enough to cover the annular space and overlap the wall by at least 1" (25).

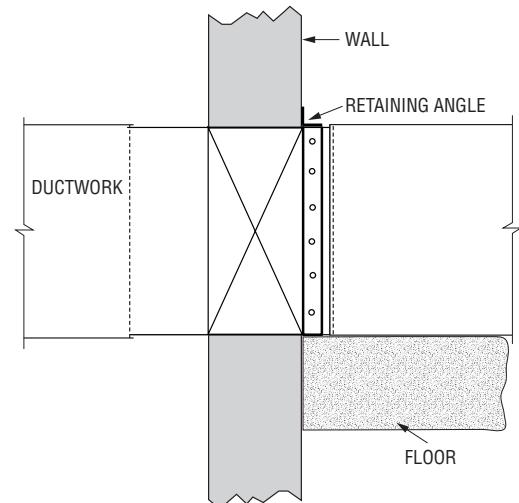


Figure 1: Retaining angle omitted from bottom side of the damper

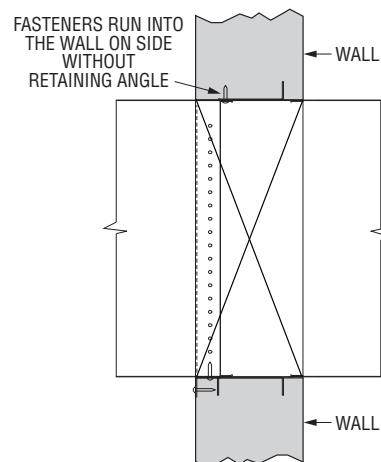


Figure 2: Fastening of damper on the side without retaining angles

Dimensions are in inches (mm).

Retaining angles must be attached to both the sleeve and the partition.

- Attachment to the sleeve shall be made with: tack or spot welds, #10 (3/4" [19] max.) sheet metal screws, or 1/4 in (6) nuts and bolts.
- Attachments to the partition shall be made using one of the following methods:
 - Drywall screws of a length such that the screw engages the steel stud/track by 1/2" (13) (steel framing). On metal stud partitions the retaining angle may be attached directly to the metal stud prior to the installation of the drywall.
 - Drywall screws of a length such that the screw engages the wood stud by 1 3/4" (45) (wood framing).
 - Steel anchors or 1/4" (6) self-tapping concrete screws of a length such that the screw penetrates the masonry or block 1 1/4" (32).
- The following applies to the attachment of the retaining angles to both the sleeve and the partition:
 - There shall be a minimum of two attachments per side
 - There shall be an attachment no more than 2" (51) from each corner and then a maximum of every 6" (152) on center.

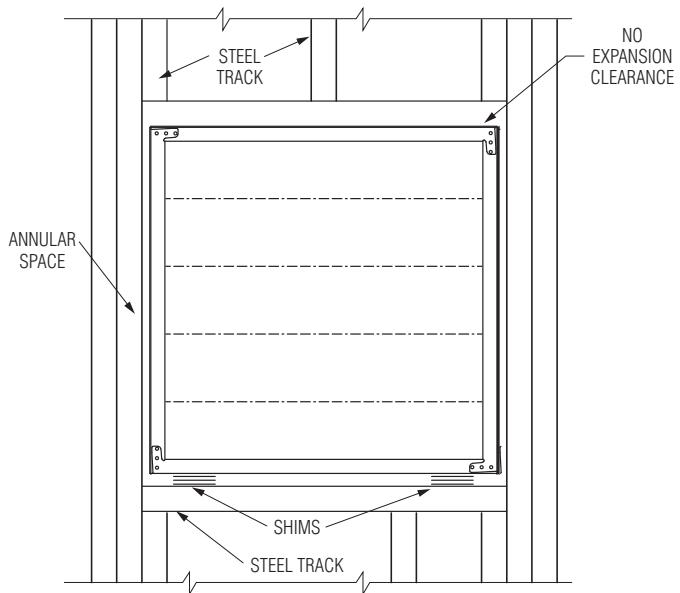
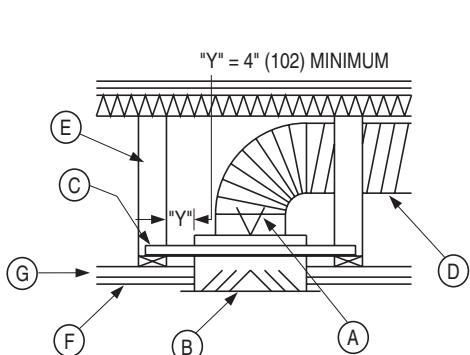
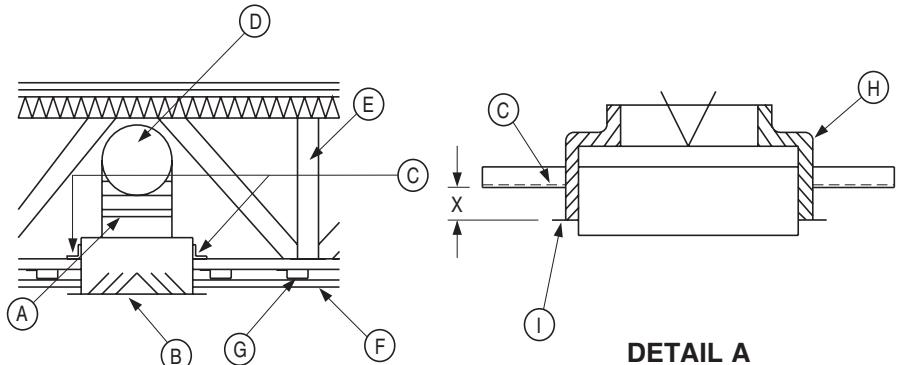


Figure 3: Steel shims left in place where center frame members meet on multiple section wide dampers when the retaining angle is omitted from the top of the damper sleeve.

INSTALLATION INSTRUCTIONS

CEILING RADIATION DAMPER • FOR USE IN WOOD TRUSS ASSEMBLIES
 UL DESIGN NO'S L528, L546, L550, L558, L562, L574, L576, L579, L581,
 L583, L585, L592, M501, M503, M526, P531, P533, P538, P545, P547, P549,
 P552, P570, P580
MODELS: 0755 AND 0755A


END VIEW WITH GRILLE

FACE VIEW
DETAIL A

- (A) Damper Assembly
- (B) Steel frame Grille/Diffuser (24 gauge (0.70) min.)
- (C) 3/4" x 3/4" x 16 gauge (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 gauge (38 x 38 x 0.85) support angle (2 sides)
- (D) Flex Duct UL Classified Air Duct (Class 0 or 1)
- (E) Wood Truss (Refer to Specific UL Design No.)

- (F) 5/8" (16) Gypsum Wallboard (Refer to Specific UL Design No.)
- (G) RC Channel
- (H) Ceramic Fiber Thermal Blanket
- (I) Plaster flange

NOTES:

1. Before installing Model 0755, open damper blades and install fusible link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
2. Place fiber blanket over assembly as shown in "Detail A". Corners of blanket may be stapled to facilitate installation.
3. Attach 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) support angles to assembly with a minimum of two #8 screws or 3/16" (5) dia. steel pop rivets each side. Distance from bottom of angle to bottom of plaster flange (X) should be the combined thickness of the wood truss member and the RC channel, usually 1 7/8" (48).
4. Install assembly between trusses as shown in End View and attach support angles to bottom cord of truss using 1 1/4" (32) long type S steel screws or similar. Minimum clearance (Dimension "Y") between damper assembly and wood truss is 4" (102).
5. Ceiling penetrations should be located between adjacent trusses and RC channels. If required, a maximum of one RC channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8" (3) on any side.
6. Flex duct shall be UL Classified Air Duct Class 0 or Class 1. Fold back neck flaps of blanket and slip flexible duct over neck of damper. Replace neck flaps of blanket over duct and fasten duct to neck over blanket using steel clamp, plastic strap, or minimum 18 gauge (1.2) steel wire in accordance with duct manufacturers' installation instructions.
7. The grille/diffuser frame shall be 24 gauge (0.61) minimum steel and shall be attached with a minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the steel plaster flange surrounding the damper assembly.

Note: Make sure that any fasteners or the flex duct does not interfere with damper operation.

Refer to UL Fire Resistance Directory Vol. I for details on UL Floor/Ceiling Design No.'s L528, L546, L550, L558, L562, L574, L576, L579, L581, L583, L585, L592, M501, M503, M526 and Roof/Ceiling Design No.'s P531, P533, P538, P545, P547, P549, P552, P570 and P580.

1 Hour Fire Rated Assemblies.

Max. Opening Size: 12" x 12" (305 x 305).

Underwriters Laboratories file #R9660 and #R1319.

Dimensions are in inches (mm).





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Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

INSTALLATION INSTRUCTIONS

CEILING RADIATION DAMPER

FOR USE IN WOOD TRUSS ASSEMBLIES

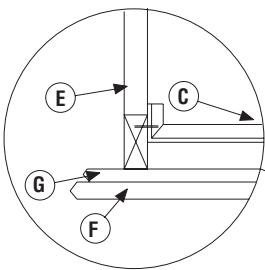
UL DESIGN NUMBERS L528, L546, L550, L558, L562, L574, L576, L579,

L581, L583, L585, M501, M503, P531, P533, P538, P545, P547, P552

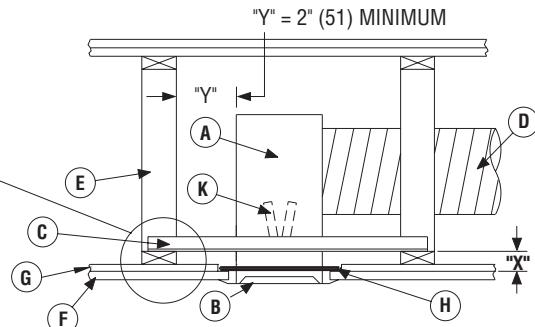
MODELS: 0756, 0756D

- (A) Steel Plenum, minimum 26 ga. (0.55)
- (B) Steel frame Grille/Diffuser, 26 ga. (0.55) minimum, see note 6
- (C) 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (19 x 19 x 0.85) Support Angle (2 sides), see notes 2 & 3
- (D) Flex Duct UL Classified Air Duct (Class 0 or 1)
- (E) Wood Truss (refer to specific UL Design No.)
- (F) 5/8" (16) Gypsum Wallboard (refer to specific UL Design No.)

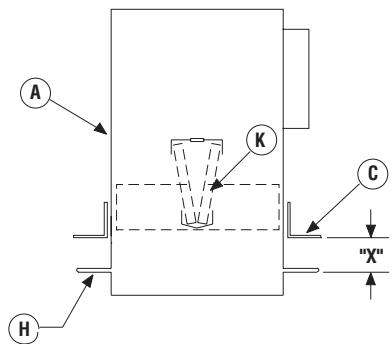
- (G) RC Channel
- (H) Plaster flange
- (I) 1" x 1" x 22 ga. (25 x 25 x .85) Retaining Angle (min.) on all 4 sides
- (J) Air Duct
- (K) Ceiling Damper (1 or 2 blades, or curtain type)



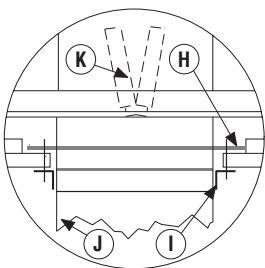
DETAIL B



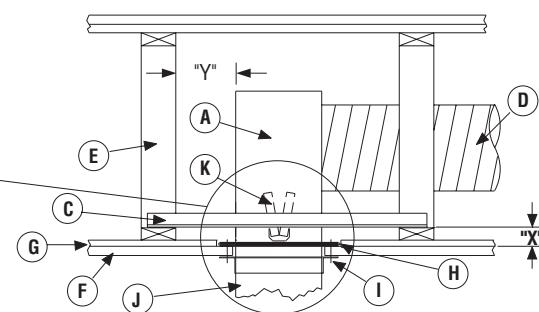
END VIEW WITH GRILLE (0756)



DETAIL A



DETAIL C



END VIEW WITH DUCT (0756D)

NOTES:

1. Before installing, open damper blades and install fusible link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
2. Attach 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) support angles to steel plenum with a minimum of two #8 screws or 3/16" (5) dia. steel pop rivets or spot welds each side. Distance from bottom of angle to bottom of plaster flange (X) should be the combined thickness of the wood truss member and the RC channel (See Detail A). **Make sure fasteners do not interfere with damper operation.**
3. Install assembly between trusses as shown in End View and attach support angles to truss lower members using 1 1/4" (32) long type S steel screws or similar. See Detail C for alternate end view with duct (0756D). See Detail B for alternate support angle attachment method. Minimum clearance (Dimension "Y") between damper assembly and wood truss is 2" (51).
4. Ceiling penetrations should be located between adjacent trusses and RC channels. If required, a maximum of one RC channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8" (3) on any side.
5. Flex duct shall be UL Classified Air Duct Class 0 or Class 1 and shall be attached to the plenum collar with steel clamps, plastic straps, or minimum 18 gauge steel wire.
6. The grille/diffuser frame shall be 26 gauge (0.55) minimum steel and shall be attached with a minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the plaster flange.
7. Refer to UL Fire Resistance Directory Vol. I for details on UL Floor/Ceiling Design No.'s L528, L546, L550, L558, L562, L574, L576, L579, L581, L583, L585, M501, M503 and Roof/Ceiling Design No.'s P531, P533, P538, P545, P547 and P552, 1 Hour Fire Rating. Max. Opening Size 16" W x 12" H (406 x 305). May be 18" W x 18" H (457 x 457) with radiation damper at ceiling level.

Dimensions are in inches (mm).



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Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

INSTALLATION INSTRUCTIONS

CEILING RADIATION DAMPERS

FOR USE IN WOOD TRUSS ASSEMBLIES

UL DESIGN NUMBERS L528, L546, L550, L558, L562, L574, L576, L579,

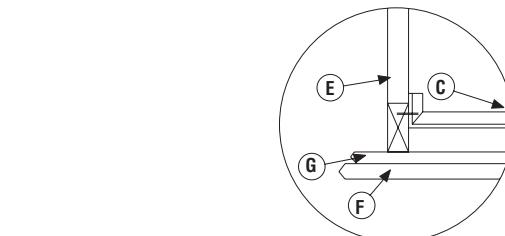
L581, L583, L585, M501, M503, P531, P533, P538, P545, P547, P552

MODELS: 0757 AND 0757D

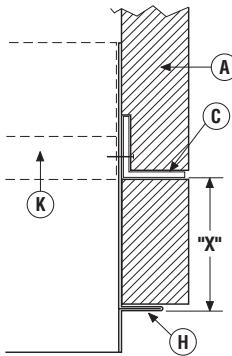
FIBERGLASS DUCTBOARD PLENUM:

- (A) Fiberglass ductboard plenum, by others.
- (B) Steel frame Grille/Diffuser, 26 ga. (0.55) minimum, see note 6
- (C) 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) Support Angle (2 sides), see notes 2 & 3
- (D) Flex Duct UL Classified Air Duct (Class 0 or 1)
- (E) Wood Truss (refer to specific UL Design No.)

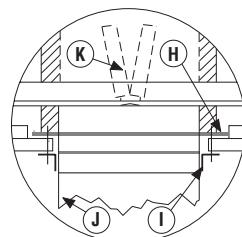
- (F) 5/8" (16) Gypsum Wallboard (refer to specific UL Design No.)
- (G) RC Channel
- (H) Plaster Flange
- (I) 1" x 1" x 22 ga. (25 x 25 x .85) Retaining Angle (min.) on all 4 sides
- (J) Air Duct
- (K) Ceiling Damper (1 or 2 blades, or curtain type)



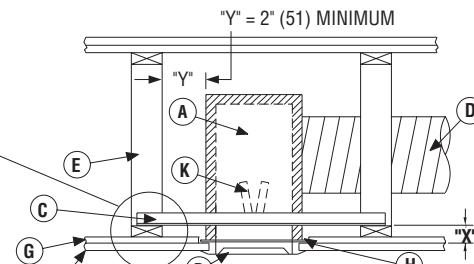
DETAIL B



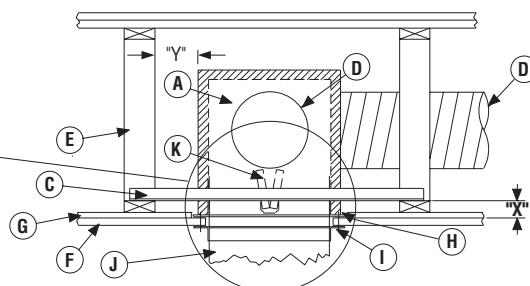
DETAIL A



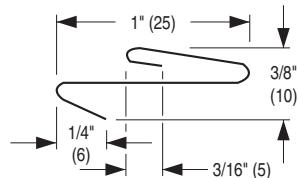
DETAIL C



END VIEW WITH GRILLE (0757)



END VIEW WITH DUCT (0757D)



Standard 26 Ga. Boot Rail

Alternate installation using standard boot rail.

Model 0757 only with 1 or 2 blade or curtain type damper.

Damper may be installed using standard boot rail.

Rails to be installed on opposite sides of boot and attached to the bottom cord of the truss using 16D nails or screws a minimum of 2" (51) long. Max. size 14" x 8" (356 x 203).

Opening Sizes:

Minimum	Maximum
6" W x 4" H (152 x 102)	21" W x 18" H (533 x 457)

NOTES:

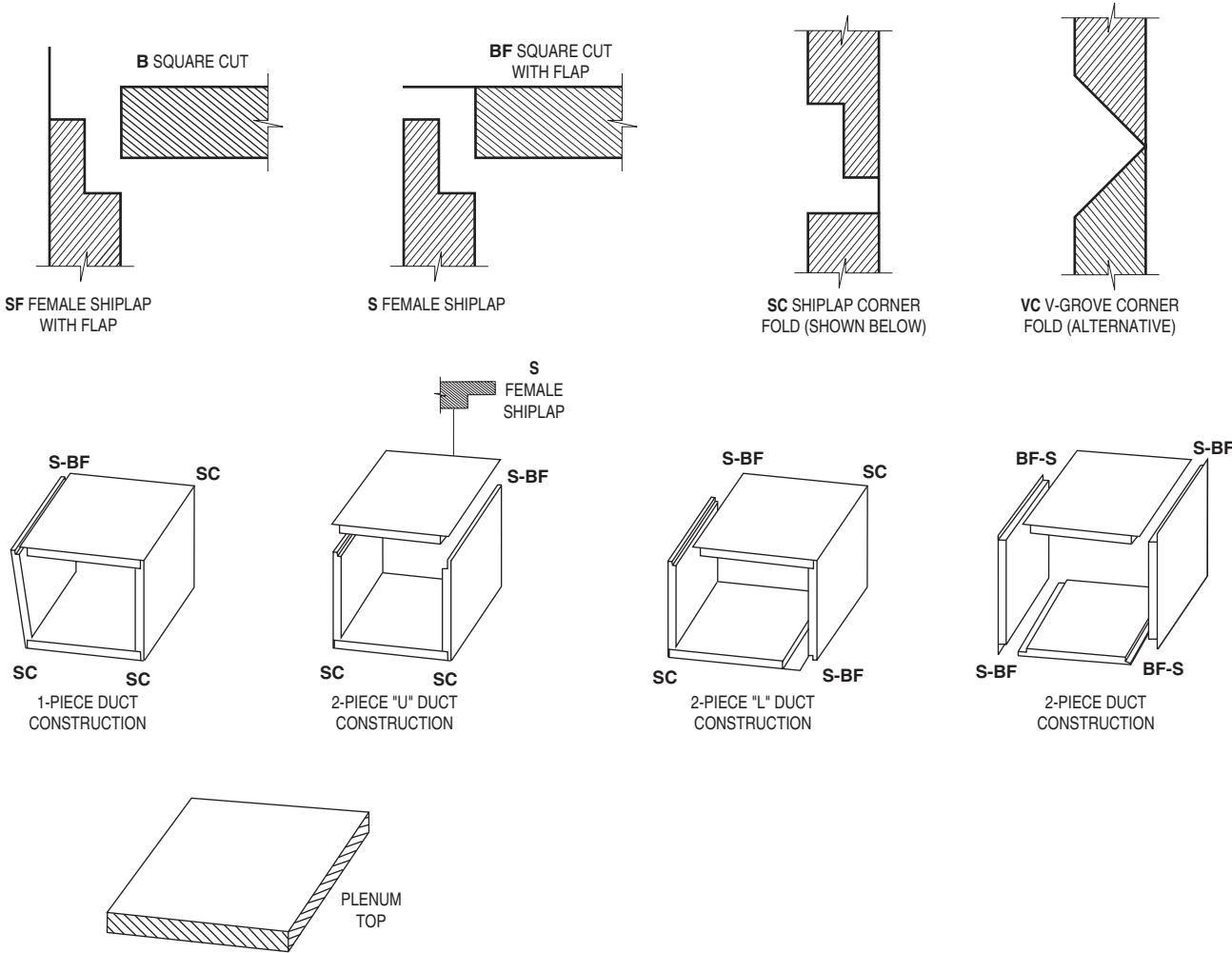
1. Before installing, open damper blades and install fusible link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
2. Attach 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) support angles to sub-frame with a minimum of two #8 screws or 3/16" (5) dia. steel pop rivets or spot welds each side. Distance from bottom of angle to bottom of plaster flange (X) should be the combined thickness of the wood truss member and the RC channel (See Detail A). **Make sure fasteners do not interfere with damper operation.**
3. Install assembly between trusses as shown in End View and attach support angles to truss lower members using 1 1/4" (32) long type S steel screws or similar. See Detail C for alternate end view with duct (0757D). See Detail B for alternate support angle attachment method. Minimum clearance (Dimension "Y") between damper assembly and wood truss is 2" (51).
4. Ceiling penetrations should be located between adjacent trusses and RC channels. If required, a maximum of one RC channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8" (3) on any side.
5. Flex duct shall be UL Classified Air Duct Class 0 or Class 1 and shall be attached to the plenum collar with steel clamps, plastic straps, or minimum 18 gauge steel wire.
6. Grille Mount Installation: The grille/diffuser frame shall be 26 ga. (0.55) minimum steel and shall be attached with a minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the plaster flange.
7. Ducted Installation: Retaining angles shall be attached with a minimum of two #8 screws per side into the damper sleeve or into the plaster flange.
8. Refer to UL Fire Resistance Directory Vol. I for details on UL Floor/Ceiling Design No.'s L528, L546, L550, L558, L562, L574, L576, L579, L581, L583, L585, M501, M503 and Roof/Ceiling Design No.'s P531, P533, P538, P545, P547, P552, 1 Hour Fire Rating.

Dimensions are in inches (mm).

Page 1 of 6

SUPPLEMENTARY INSTALLATION INSTRUCTIONS

FABRICATION OF FIBERGLASS DUCTBOARD PLENUM



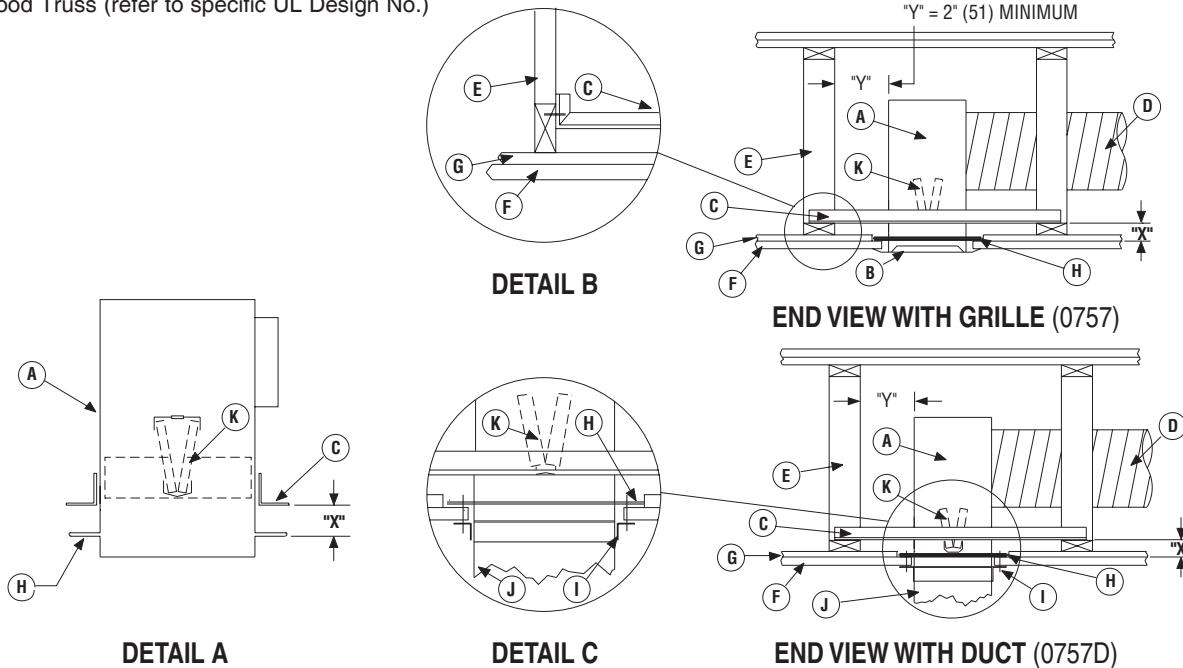
NOTES:

1. Fiberglass ductboard shall be UL 181 listed and have a density of 4 lbs. per cubic foot and a minimum thickness of 7/8" (22).
2. Edge and corner preparation shall be in accordance with details shown above. Plenum top shall be fabricated and attached using similar method, S-BF or BF-S.
3. Corner sealing tape shall be UL 181 listed and a minimum of 2" (51) wide.
4. Plenum shall be attached to the ceiling damper sub-frame using UL 181 listed tape.
5. Refer to page 1 of 6, for ceiling damper installation detail.
6. The 0757(D) Series ceiling Radiation Damper is classified for use in specific wood truss ceiling assemblies. See UL Fire Resistance Directory for Floor/Ceiling design No.'s L528, L546, L550, L558, L562, L574, L576, L579, L581, L583, L585, M501, M503 and Roof/Ceiling design No.'s P531, P533, P538, P545, P547, P552.

STEEL PLENUM:

- (A) Steel Plenum, (Register Boot/Box), by others, Min. 26 ga. (0.55) galvanized steel uninsulated Min. 28 ga. (0.47) galvanized steel insulated
- (B) Steel frame Grille/Diffuser, 26 ga. (0.55) min., see note 6
- (C) 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) Support Angle (2 sides), see notes 2 & 3
- (D) Flex Duct UL Classified Air Duct (Class 0 or 1)
- (E) Wood Truss (refer to specific UL Design No.)

- (F) 5/8" (16) Gypsum Wallboard (refer to specific UL Design No.)
- (G) RC Channel
- (H) Plaster flange
- (I) 1" x 1" x 22 ga. (25 x 25 x .85) Retaining Angle (min.) on all 4 sides
- (J) Air Duct
- (K) Ceiling Damper (1 or 2 blades, or curtain type)



NOTES:

1. Before installing, open damper blades and install fusible link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
2. Attach 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) support angles to steel plenum with a minimum of two #8 screws or 3/16" (5) dia. steel pop rivets or spot welds each side. Distance from bottom of angle to bottom of plaster flange (X) should be the combined thickness of the wood truss member and the RC channel (See Detail A). **Make sure fasteners do not interfere with damper operation.**
3. Install assembly between trusses as shown in End View and attach support angles to truss lower members using 1 1/4" (32) long type S steel screws or similar. See Detail C for alternate end view with duct (0757D). See Detail B for alternate support angle attachment method. Minimum clearance (Dimension "Y") between damper assembly and wood truss is 2" (51).
4. Ceiling penetrations should be located between adjacent trusses and RC channels. If required, a maximum of one RC channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8" (3) on any side.
5. Flex duct shall be UL Classified Air Duct Class 0 or Class 1 and shall be attached to the plenum collar with steel clamps, plastic straps, or minimum 18 gauge steel wire.
6. Grille Mount Installation: The grille/diffuser frame shall be 26 ga. (0.55) minimum steel and shall be attached with a minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the plaster flange.
7. Ducted Installation: Retaining angles shall be attached with a minimum of two #8 screws per side into the damper sleeve or into the plaster flange.
8. The grille/diffuser frame shall be 26 gauge (0.55) minimum steel and shall be attached with a minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the plaster flange.
9. See table on page 4 of 6 for sizing details.
10. Refer to UL Fire Resistance Directory Vol. I for details on UL Floor/Ceiling Design No.'s L528, L546, L550, L558, L562, L574, L576, L579, L581, L583, L585, M501, M503 and Roof/Ceiling Design No.'s P531, P533, P538, P545, P547, P552, 1 Hour Fire Rating.

Dimensions are in inches (mm).

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SUPPLEMENTARY INSTALLATION INSTRUCTIONS

FABRICATION OF STEEL PLENUM

1 OR 2 BLADE STYLE DAMPERS:

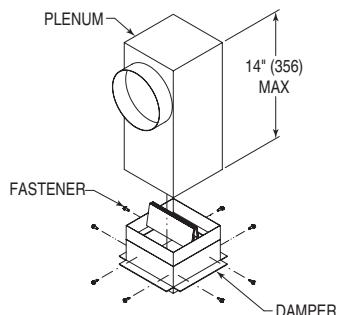


FIGURE 1A
MODEL 0757 - TYPE A PLENUM

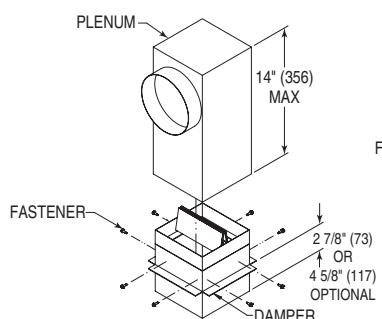
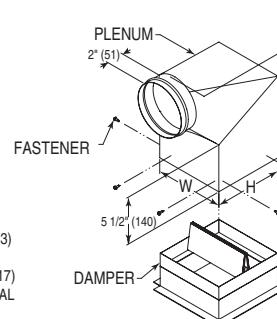
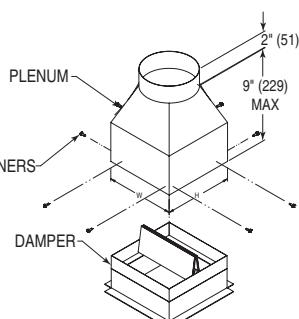


FIGURE 1B
MODEL 0757D - TYPE B PLENUM

ALTERNATE PLENUM DETAILS:



MODEL 0757 - TYPE D PLENUM



MODEL 0757 - TYPE E PLENUM

CURTAIN STYLE DAMPERS:

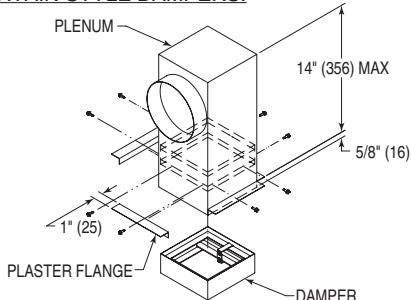


FIGURE 2A
MODEL 0757 - TYPE A PLENUM

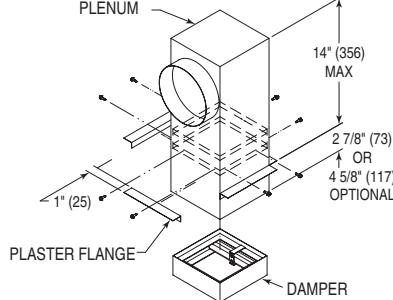


FIGURE 2B
MODEL 0757D - TYPE B PLENUM

INSULATED PLENUM DETAILS (DAMPER NOT SHOWN):

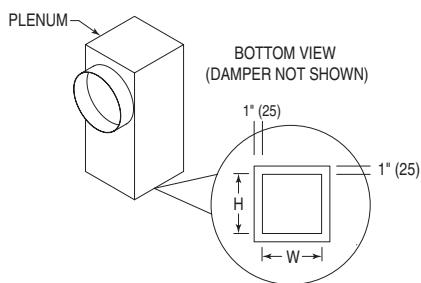
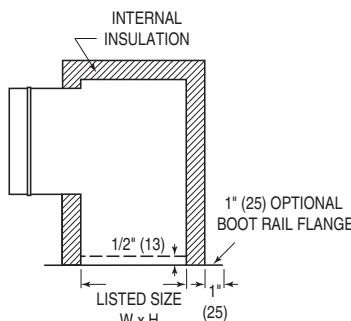


FIGURE 3
MODEL 0757 - TYPE C INSULATED PLENUM



Plenum Type	Description/Installation	Min. Inside Plenum Dim.	Max. Damper Size	Max. Inside Plenum Dim.	Max. Inlet/Outlet Collar Size	Max. Number of Collars	Max. Overall Height
A	Grille Mount	6 x 4 (152 x 102)	16 x 12 (406 x 305)	16 x 12 (406 x 305)	10 (254) Dia.	5	14 (356)
B	Ducted	6 x 4 (152 x 102)	18 x 18 (457 x 457)	18 x 18 (457 x 457)	10 (254) Dia.	5	14 (356)
C	Insulated, 90° Side Inlet	8 x 4 (203 x 102)	12 x 12 (305 x 305)	12 x 12 (305 x 305)	10 (254) Dia.	1	14 (356)
D	Tapered, 90° Side Inlet	8 x 4 (203 x 102)	14 x 8 (356 x 203)	14 x 8 (356 x 203)	10 (254) Dia.	1	14 (356)
E	Tapered, Top Inlet	8 x 4 (203 x 102)	12 x 12 (305 x 305)	12 x 12 (305 x 305)	10 (254) Dia.	1	11 (279)

NOTES:

1. The steel plenum box and top shall be a minimum of 26 ga. (0.55) galvanized steel for uninsulated plenums, or minimum of 28 ga. (0.47) for insulated plenums, fastened together per SMACNA HVAC Duct Construction Standards, 4" (102) max. OC. In addition, the plenum top must be fastened 1" (25) max. from each side edge.
2. The inside dimensions (W x H) of the steel plenum shall be sized no greater than 1/8" (3) larger than the damper frame.
3. Duct outlet collars shall be round, oval, square, or rectangular, 78 1/2 sq. in. (50.6 sq. cm.) maximum per outlet per side with a maximum of 5 outlets with a combined area of 236 sq. in. (152 sq. cm.) for Plenum Type A or B, see chart above for alternate plenum type details. Outlet collars are not permitted on plenum box top for Type A or B plenums.
4. The damper is to be attached to the steel plenum box using steel rivets, spot welds, lock forms, or sheet metal screws 4" (102) max. OC, equally spaced around the circumference of the plenum box collar. Make sure fasteners do not interfere with damper operation.
5. For insulated plenums (Type C), attach the damper plaster flange to the bottom side of the plenum box, see Figure 3 above details. Fasten damper to plenum using self-piercing steel rivets, 4" (102) max. OC, equally spaced around the plenum box.
6. For insulated plenums (Type C), insulation shall be semi rigid Type R-6, 1 1/2" (28) or Type R-8, 2" (51) fiberglass duct liner, minimum density 1.5 pcf. Insulation is self-supporting within plenum box. All internal surfaces must be lined with insulation, excluding outlet collar. The bottom edge of the insulation is trapped by a lip that is formed on the plenum box that extends a min. of 1" (25) from the inner edge of the opening to the outer edge of the box and extends a min. of 1/2" (13) up into the opening. See detail above.
7. Optionally, Plenum Types D & E can also be insulated per requirements in note 5 & 6.
8. For curtain style ceiling dampers, a 1" x 1" x 22 ga. (25 x 25 x 0.85) min. plaster flange is secured to the plenum box using spot welds, self-piercing steel rivets, or sheet metal screws, spaced max. 6" (152) max. OC, 2" (51) from each corner (See Figure 2A or 2B).
9. Refer to page 3 of 6, document IOM-CRD0757INST for ceiling damper installation detail.
10. The 0757(D) Series Ceiling Radiation Damper is classified for use in specific wood truss ceiling assemblies. See UL Fire Resistance Directory for Floor/Ceiling design No.'s L528, L546, L550, L558, L562, L574, L576, L579, L581, L583, L585, M501, M503 and Roof/Ceiling design No.'s P531, P533, P538, P545, P547, P552.



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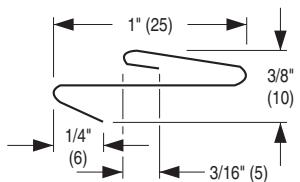
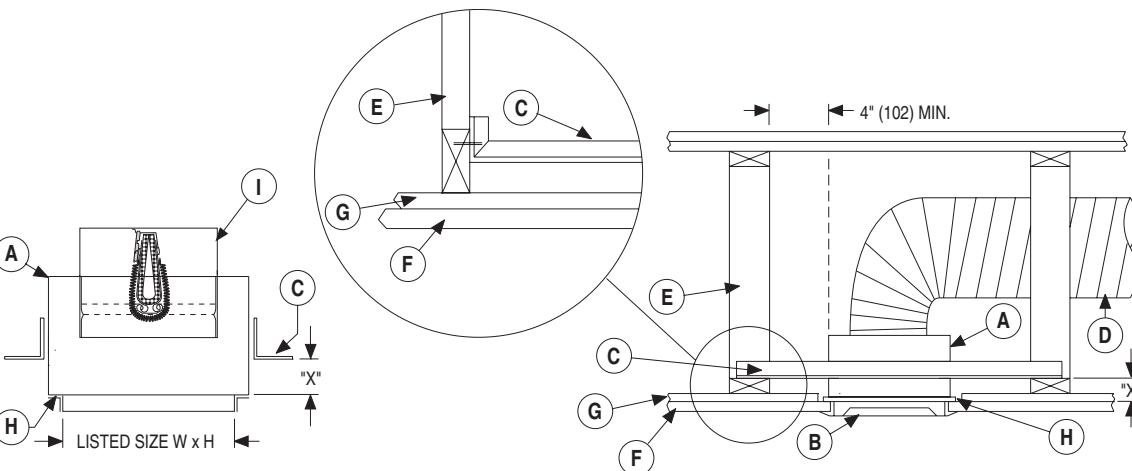
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- (A) Steel Register box (boot), by others, Min. 28 ga. (0.474) insulated.
- (B) Steel frame Grille/Register, 26 ga. (0.55) minimum, see note 6
- (C) 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) Support Angle (2 sides), see notes 2 & 3
- (D) Flex Duct UL Classified Air Duct (Class 0 or 1)

- (E) Wood Truss (refer to specific UL Design No.)
- (F) 5/8" (16) Gypsum Wallboard (refer to specific UL Design No.)
- (G) RC Channel
- (H) Plaster Frame
- (I) Round Ceiling Damper



Std. 26 Ga. Boot Rail
Alternate installation using standard boot rail.
Model 0763.

Damper may be installed using standard boot rail. Rails to be installed on opposite sides of boot and attached to the bottom cord of the truss using 16D nails or screws a minimum of 2" (51) long. Maximum size 14" x 8" (356 x 203).

DETAIL B

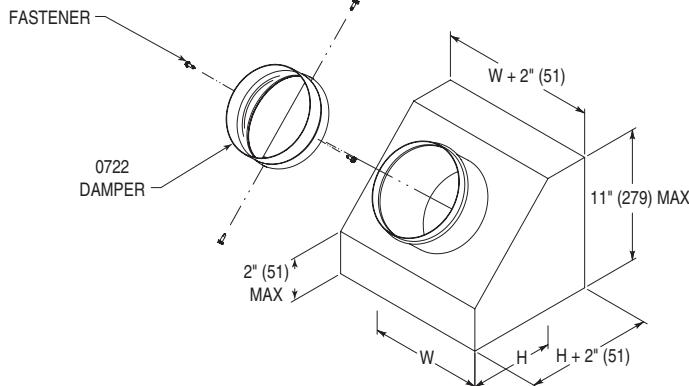
END VIEW WITH GRILLE

NOTES:

1. Before installing, open damper blades and install fusible link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
2. Attach 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85) support angles to steel register box with a minimum of two #8 screws or 3/16" (5) dia. steel rivets or spot welds each side. Distance from bottom of angle to bottom of plaster flange (X) should be the combined thickness of the wood truss member and the RC channel (See Detail A). **Make sure fasteners do not interfere with damper operation.**
3. Install assembly between trusses as shown in End View and attach support angles to truss lower members using 1 1/4" (32) long type S steel screws or similar. See Detail B for alternate support angle attachment method.
4. Ceiling penetrations should be located between adjacent trusses and RC channels. If required, a maximum of one RC channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8" (3) on any side.
5. Flex duct shall be UL Classified Air Duct Class 0 or Class 1 and shall be attached to the plenum collar with steel clamps, plastic straps, or minimum 18 gauge steel wire.
6. The grille/register frame shall be 26 gauge (0.55) minimum steel and shall be attached with a minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the plaster flange.
7. Refer to UL Fire Resistance Directory Vol. I for details on UL Floor/Ceiling Design No.'s L528, L546, L550, L558, L574, L576, L579, L581, L583, L585, M503 and Roof/Ceiling Design No.'s P531, P533, P545, P547, P552, 1 Hour Fire Rating.



SUPPLEMENTARY INSTALLATION INSTRUCTIONS FABRICATION OF STEEL PLENUM



Type F Plenum

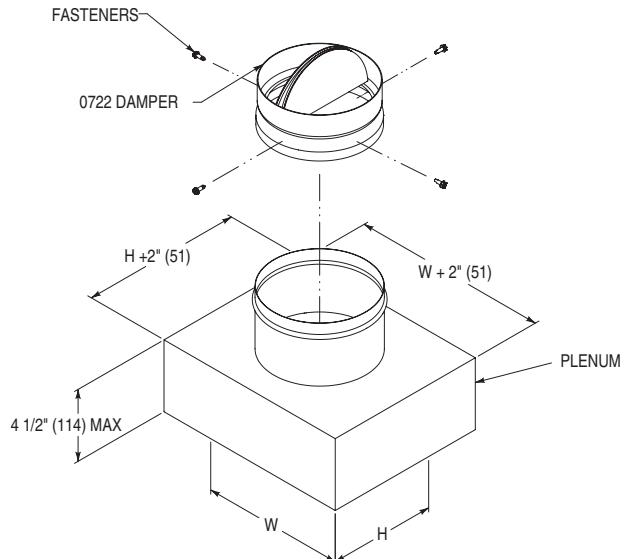
45° Inlet. Insulated Register Box

Round ceiling damper in inlet collar.

Min. size: 8" x 4" (203 x 102), 5" (127) dia. inlet

Max. size: 14" x 6" (356 x 152), 8" (203) dia. inlet

Max. Overall Height: 11" (279)



Type G Plenum

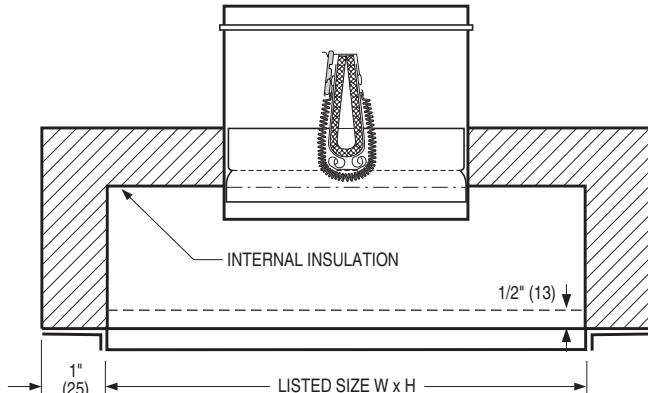
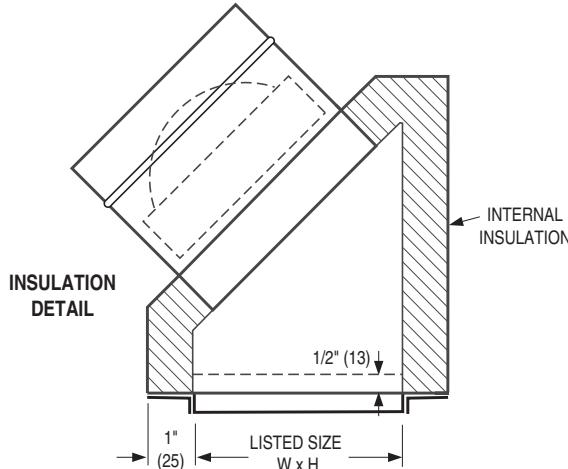
Top Inlet. Insulated Register Box

Round ceiling damper in inlet collar.

Min. size: 8" x 4" (203 x 102), 4" (102) dia. inlet

Max. size: 14" x 8" (356 x 203), 8" (203) dia. inlet

Max. Overall Height: 8" (200)



NOTES:

1. The steel plenum box and top shall be a minimum of 28 ga. (0.47) galvanized steel fastened together per SMACNA HVAC Duct Construction Standards, 4" (102) OC.
2. The outlet collar shall be 28 ga. (0.47) and shall be undersized 1/8" (3) small than the diameter of the damper frame.
3. The damper shall be attached to the plenum box collar using steel rivets, spot welds, lock forms, or sheet metal screws, 4" (102) max. OC, equally spaced around the circumference of the collar. **Make sure fasteners do not interfere with damper operation.**
4. Insulation shall be semi rigid Type R-6, 1 1/2" (28) or Type R-8, 2" (51) fiberglass duct liner, minimum density 1.5 pcf. Insulation is self-supporting within plenum box. All internal surfaces must be lined with insulation, excluding outlet collar. The bottom edge of the insulation is trapped by a lip that is formed on the plenum box that extends a min. of 1" (25) from the inner edge of the opening to the outer edge of the box and extends a min. of 1/2" (13) up into the opening. See detail above.
5. Refer to page 1 of 2 of document IOM-CRD0763INST for ceiling damper installation detail.
6. The 0763 Series Ceiling Radiation Damper is classified for use in specific wood truss ceiling assemblies. See UL Fire Resistance Directory for Floor/Ceiling design No.'s L528, L546, L550, L558, L574, L576, L579, L581, L583, L585, M503 and Roof/Ceiling design No.'s P531, P533, P538, P545, P547, P552.

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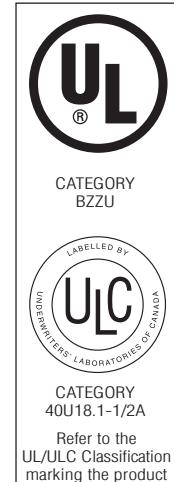
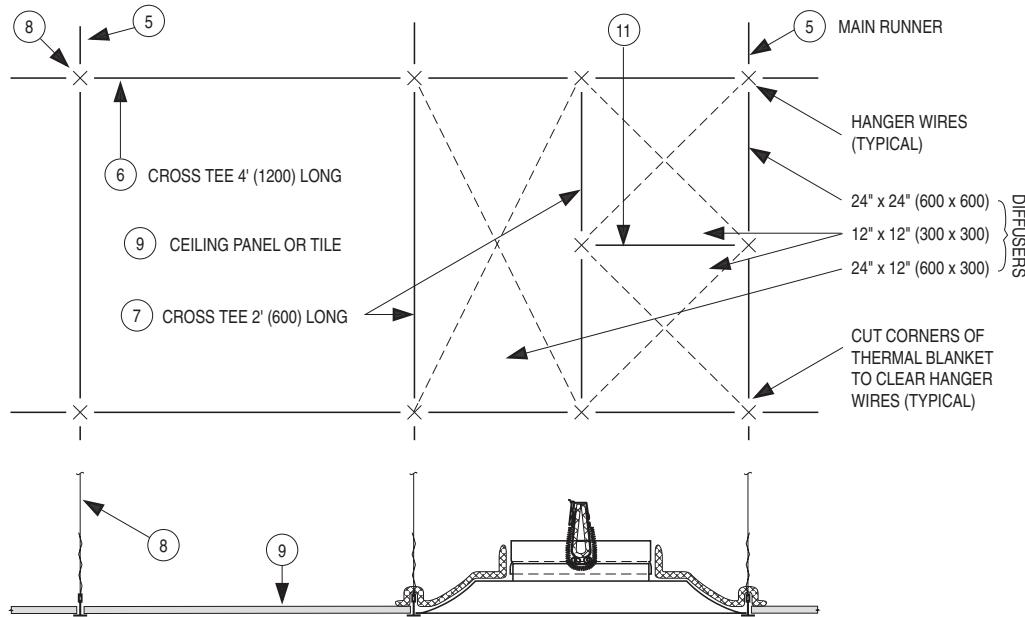
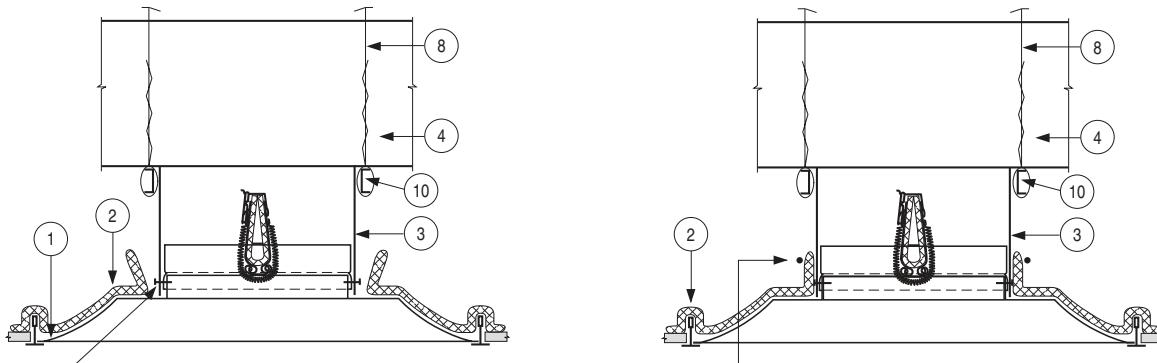


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STEP 1: CEILING GRID LAYOUT


FOLD BACK NECK FLAPS OF THERMAL BLANKET, SLIP ON STEEL DUCT DROP AND FASTEN TO DIFFUSER NECK WITH FOUR #8 SHEET METAL SCREWS. SCREWS MUST NOT INTERFERE WITH THE CLOSING OF THE INTEGRAL DAMPER BLADES.

FASTEN NECK FLAPS OF THERMAL BLANKET USING 18 SWG STEEL WIRE.

STEP 2: DUCT DROP INSTALLATION

1. Series 4000 or 4400 Diffuser
2. Ceramic fiber thermal blanket*
3. Steel duct drop
4. Steel duct
5. Main T-Bar runner

*Caution: Replace thermal blanket if it is damaged during shipping or installation.

6. 4'-0" (1200) cross T-Bar
7. 2'-0" (600) cross T-Bar
8. Hanger wires
9. Ceiling panel or tile
10. Support channels
11. 1'-0 (300) cross T-Bar. See note 9.

STEP 3: THERMAL BLANKET INSTALLATION

1. Follow carefully steps 1, 2 and 3.
2. Before installing, open damper blades and install link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position
3. Use 12 swg galvanized steel hanger wires to independently support the T-bar grid members and the support channels to the structural members of the floor or roof above at the four corners of the diffuser. Ensure hanger wires are plumb and straight.
4. When installing the Ceiling Air Diffuser in duct drop, use #8 by 1/2" (13) long sheet metal screws - 4 per diffuser. The screws shall not interfere with the closing of the Integral Classified Ceiling Damper of the Ceiling Air Diffuser Assembly.
5. Support the duct with 2 - 16 gauge cold rolled steel support channels, 1 1/2" (38) deep with 1/2" (13) flanges. Place the support channels at the bottom of the duct adjacent to both sides of the duct drop.
6. Maximum neck size of Series 4000 and 4400 Ceiling Air Diffuser is 14" (356) diameter.
7. The clearance between the Ceiling Air Diffuser neck and the duct drop shall be 1/8" (3) maximum.
8. No diffusers shall be located in an adjacent 24" x 48" (600 x 1200) ceiling grid module.
9. Series 4000 and 4400 Ceiling Air Diffuser Assemblies are for use in lieu of the hinged blade, sheet metal damper in steel ducts with steel diffusers or grilles as specified in the "Design Information Section - General" and in the individual floor and roof ceiling design(s) being used, as illustrated and described in the current UL "Fire Resistance Directory" or ULC "List of Equipment and Materials".
10. Fire resistive designs must cover UL/ULC Classified Ceiling Grid Members with appropriate cross tee sizes and slots in cross tees.

The following manufacturers currently supply 1'- 0" (300) long cross tees that are UL and/or ULC Classified:

- Armstrong World Industries Inc.
- CGC Interiors, Division of CGC Inc.
- Chicago Metallic Corp.
- USG Interiors Inc.

Cartons of Grid Members shall be of the same type and bear the UL and/or ULC Classification marking.

Dimensions are in inches (mm).

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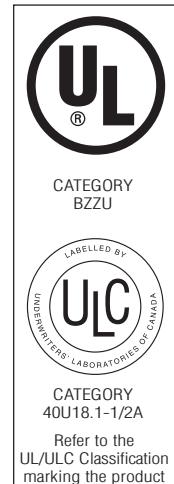
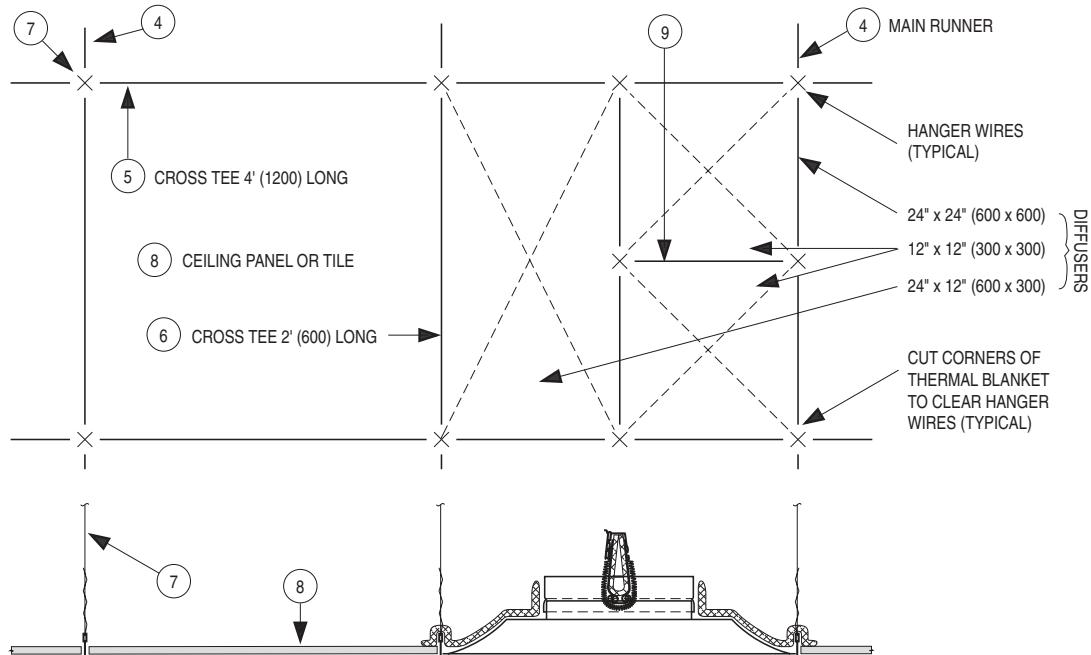
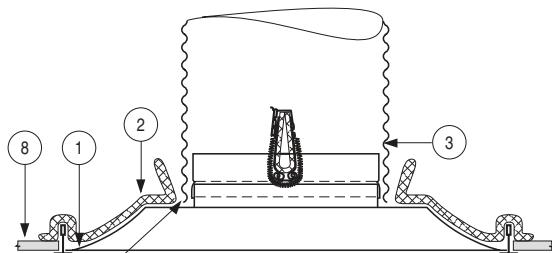


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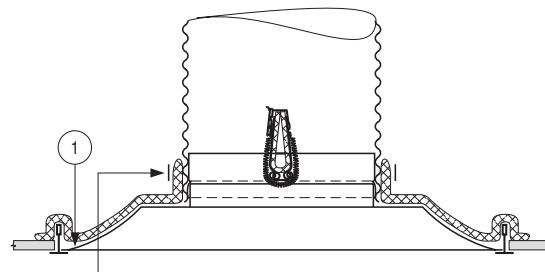
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STEP 1: CEILING GRID LAYOUT


FOLD BACK NECK FLAPS OF THERMAL BLANKET. SLIP FLEXIBLE DUCT OVER THE NECK OF THE DIFFUSER.


STEP 3: THERMAL BLANKET INSTALLATION

1. Series 4000 or 4400 Diffuser
2. Ceramic fiber thermal blanket*
3. Flexible duct
4. Main T-Bar runner

*Caution: Replace thermal blanket if it is damaged during shipping or installation.

5. 4'-0" (1200) cross T-Bar
6. 2'-0" (600) cross T-Bar
7. Hanger wires
8. Ceiling panel or tile
9. 1'-0 (300) cross T-Bar. See note 9.

1. Follow carefully steps 1, 2 and 3.
2. Before installing, open damper blades and install link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position
3. The Flexible Air Duct Connector shall be Class 0 or Class 1 bearing the UL/ULC Classification marking. See the UL "Gas and Oil Equipment Directory" or ULC "List of Equipment and Materials". The maximum length of the flexible duct shall not exceed 14'-0" (4267) in length. No portion of the duct shall rest on the back surface of the ceiling panels or tiles and a minimum of 4" (102) clearance must be maintained. Where the flexible duct must be supported, use steel straps and 12 swg steel hanger wires.
4. The end tabs of the 2'-0" (600) Cross T-bar shall be bent back against the web of the 4'-0" (1200) Cross T-bar. The 4'-0" (1200) Cross T-bars must have slots in the web for connection of the 2'-0" (600) Cross T-bar.
5. Use 12 swg galvanized steel hanger wires to independently support the ceiling T-bars to the structural members of the floor or roof above at the four corners of the diffuser. Ensure hanger wires are plumb and straight.
6. Maximum neck size of Series 4000 and 4400 Ceiling Air Diffuser is 14" (356) diameter.
7. Caution should be observed so that the Flexible Air Duct Connector does not interfere with the operation of the Integral Classified Ceiling Damper of the Ceiling Air Diffuser Assembly.
8. No diffusers shall be located in an adjacent 24" x 48" (600 x 1200) ceiling grid module.
9. Series 4000 and 4400 Ceiling Air Diffuser Assemblies are for use in lieu of the hinged blade, sheet metal damper in steel ducts with steel diffusers or grilles as specified in the "Design Information Section - General" and in the individual floor and roof ceiling design(s) being used, as illustrated and described in the current U.L. "Fire Resistance Directory" or ULC "List of Equipment and Materials".
10. Fire resistive designs must cover UL/ULC Classified Ceiling Grid Members with appropriate cross tee sizes and slots in cross tees.

The following manufacturers currently supply 1'-0" (300) long cross tees that are UL and/or ULC Classified:

- Armstrong World Industries Inc.
- CGC Interiors, Division of CGC Inc.
- Chicago Metallic Corp.
- USG Interiors Inc.

Cartons of Grid Members shall be of the same type and bear the UL and/or ULC Classification marking.

Dimensions are in inches (mm).

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(Model 4070-SM shown in example).

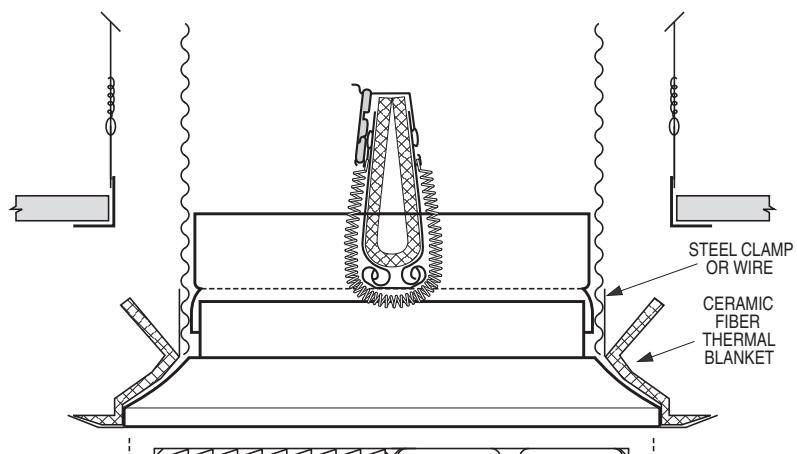
STEP 1:

Cut hole in ceiling membrane 11 1/4" x 11 1/4" (286 x 286). Insert sub-frame through hole and using four tabs provided, hang sub-frame to structural members of the floor or roof above using #12 SWG galvanized steel hanger wire.



STEP 2:

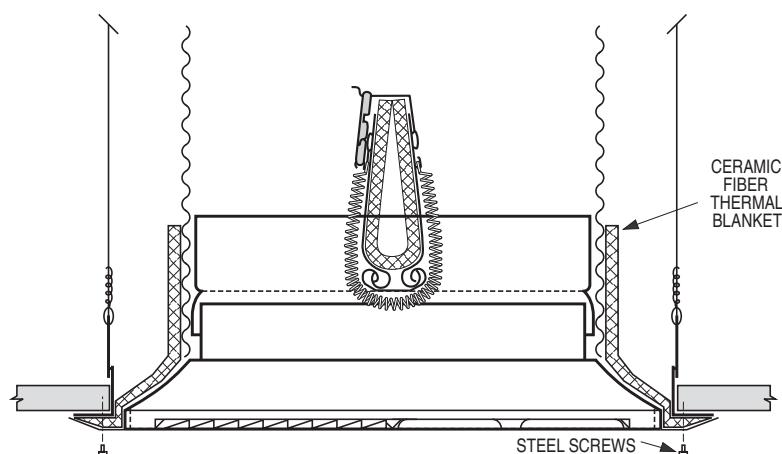
With radiation damper in an open position and thermal blanket installed over back face of the diffuser, fold back neck tabs of thermal blanket and install flexible duct to neck of diffuser using steel clamps or wire. Do not use bolts, screws or rivets. Push neck flaps of thermal blanket back up neck of diffuser and secure in place with steel wire.



STEP 3:

Carefully push flexible air duct back into ceiling cavity making sure that it does not distort and foul radiation damper blades. The thermal blanket should be sandwiched between the sub-frame and the flange of the diffuser as shown.

Install screws provided through diffuser and sub-frame holes to complete the assembly.



1. Follow carefully steps 1, 2 and 3.
2. Before installing, open damper blades and install link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
3. The flexible duct shall be Class 0 or Class 1 bearing the UL Classification marking. See the UL "Gas and Oil Equipment Directory" or see ULC "List of Equipment and Materials". The maximum length of the duct shall not exceed 14'-0" (4267) in length. No portion of the connector shall rest on the back surface of the ceiling panels or tiles and a minimum of 4" (102) clearance must be maintained. Where the duct must be supported, use steel straps and 12 SWG steel hanger wires.
4. Maximum neck size of Series 4010-SM, 4410-SM or 4070-SM Ceiling Air Diffusers is 8" (203) diameter.
5. Caution should be observed so that the flexible duct does not interfere with the operation of the Integral Classified Ceiling Damper of the Ceiling Air Diffuser Assembly.

Dimensions are in inches (mm).



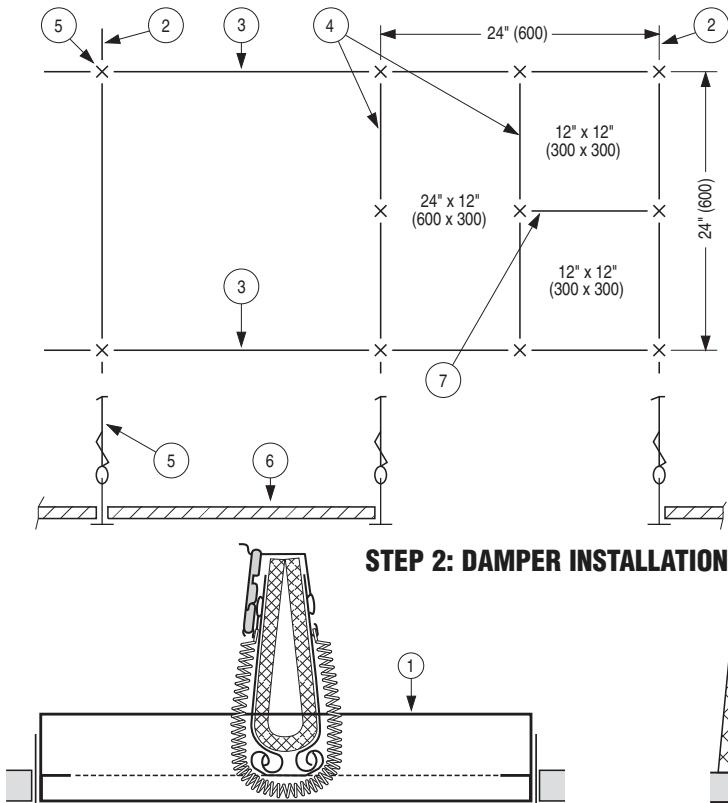
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STEP 1: CEILING GRID LAYOUT (12" x 12": 24" x 12": 24" x 24" (300 x 300: 600 x 300: 600 x 600) SIZES)



MODELS 4111 THRU 4119 FOR DETAILS SEE DWG. 4100-1A

1. Follow carefully steps 1 and 2 as illustrated above.
2. Before installing, open damper blades and install link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
3. The end tabs of the 2'-0" (600) Ceiling Grid Member shall be bent back against the web of the 4'-0" (1200) Ceiling Grid Member. The 4'-0" (1200) Ceiling Grid Member must have slots in the web for connection of the 2'-0" (600) Ceiling Grid Member.
4. Use 12 ga. (2.5) galvanized steel hanger wires at the corners of the grid modules to support the Ceiling Grid Member to the structural members of the floor or roof above. Wires must hang vertically, not slantwise.
5. Maximum size of the Fire-Rated Ductless Return Air Damper (and Grille*) is 24" x 24"(600 x 600).
6. All UL/ULC Classified Ceiling Assemblies require that Lay-in Ceiling Panels, filling the remainder of the module, less than 24" x 48" (600 x 1200) shall bear on the Ceiling Grid Member by a minimum of 3/8" (10).
7. No Fire-Rated Ductless Return Air Damper (or Grille*) shall be located in an adjacent 24" x 48" (600 x 1200) Ceiling Grid Module.
8. Series 4110 and 4120 Fire-Rated Ductless Return Air Damper (and Grilles*) are for use in place of the Hinged Blade, Sheet Metal Dampers in steel ducts with steel diffusers or grilles as specified in the "Design Information Section - General" and in the individual floor or roof ceiling design(s) being used as illustrated and described in the current U.L. Fire Resistance Directory or ULC List of Equipment and Materials Volume III Fire Resistance Ratings.
9. Fire resistive designs must cover UL/ULC Classified Ceiling Grid Members with appropriate cross tee sizes and slots in cross tees. The following manufacturers currently supply 1'-0" (300) long cross tees that are UL and/or ULC Classified:
 - Armstrong World Industries Inc.
 - CGC Interiors, Division of CGC Inc.
 - Chicago Metallic Corp.
 - USG Interiors Inc.

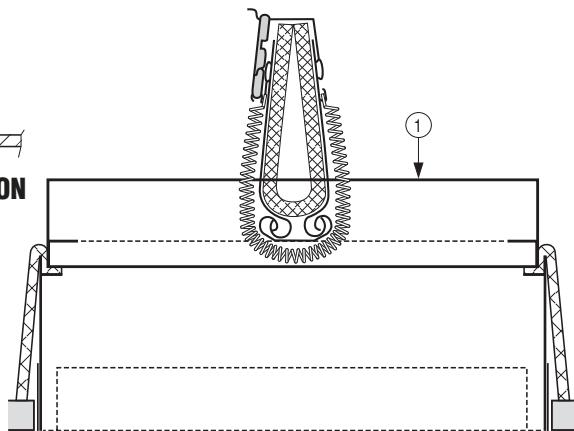
Cartons of grid members shall be of the same type and bear the UL/ULC Classification marking.

*Grilles are optional on Models 4127 thru 4129.

ITEMS:

1. Series 4110 and 4120 Ductless Return Air Damper (and Grille*).
2. Main Ceiling Grid Member.
3. 4'-0" (1200) Ceiling Grid Member.
4. 2'-0" (600) Ceiling Grid Member.
5. Hanger Wire.
6. Ceiling Panel or Tile (see note 5).
7. 1'-0" (300) Ceiling Grid Member.

Items 2, 3, 4, 6 and 7 are UL/ULC Classified.



MODELS 4121 THRU 4129 FOR DETAILS SEE DWGS. 4100-2 & 3

Dimensions are in inches (mm).



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QUALIFICATIONS:

- UL 555C Classified Ceiling Damper (File #9660).
- CAN4-S112.2 Ceiling Firestop Flap Assemblies.
- California State Fire Marshal: Fire Damper Listing No. 3225-0935:102.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.
- Meets the requirements for NFPA 90A, IBC and NBC (Canada) and associated local building codes.


 Refer to the
 UL Classification
 Marking on the
 Product

NOTES:

1. Model Series 0700 Ceiling Dampers (known as Fire Stop Flaps in Canada) are for use in place of the hinged blade, sheet metal damper in steel ducts with steel diffuser or grille as specified in the "Design Information Section – General" and in the individual floor or roof ceiling design(s) being used, as illustrated and described in the current UL Fire Resistance Directory. One ceiling damper of the same size as the allowable duct outlet size may be substituted for each hinged sheet metal damper specified in the design.
 The clearance between each side of the ceiling damper and the duct drop shall be 1/8" (3) maximum.
2. Opening in ceiling membrane may be up to 1" (25) larger than the nominal size of the ceiling radiation damper. For exposed grid T-Bar ceiling systems, where the opening in the ceiling membrane is larger (more than 1" (25)) than the ceiling damper, a thermal blanket (Model 0725 or 0726) must be installed over the exposed surface of the diffuser (see lay-in diffuser applications).
 Duct outlets in lay-in ceilings should be located within the field of an acoustical ceiling panel or tile.
 Where it is necessary to cut a main runner or cross tee, each cut end shall be supported by a vertical No. 12 SWG hanger wire. A 1/2" (13) clearance shall be maintained between the duct outlet and each cut end at main runner and cross tee. The duct outlet shall be located so that no more than one main runner or cross tee is cut when penetrating the ceiling membrane.
3. A. Before installing Model 0716 or 0722, open blades and install fusible link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
 B. After installing damper model 0714 in duct drop, open blade and attach link to duct or duct drop.

4. INSTALLATION:
Method 1. Type 0714, 0716 and 0720

Attach the two 16 ga. (1.6) steel support channels. (1 1/2" (38) deep with 1/2" (13) flanges), through the duct drop and ceiling damper using 3/16" (5) diameter by 1/2" (13) long steel bolts spaced 6" (152) o.c. maximum, with two bolts per channel minimum. The bolts shall not interfere with the closing of the ceiling damper.

Method 2. Type 0714, 0716, 0720 and 0722

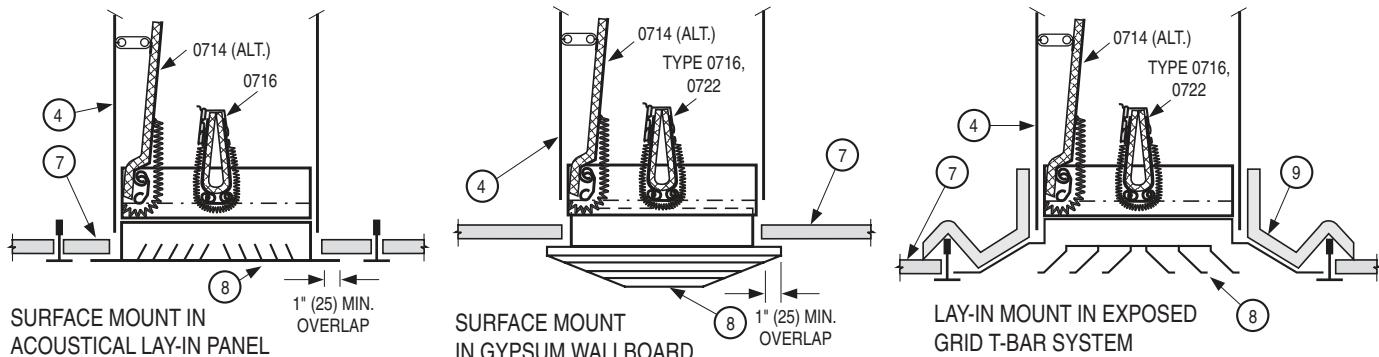
Support the duct with two 16 ga. (1.6) steel support channels (1 1/2" (38) deep with 1/2" (13) flanges). Place the support channels at the bottom of the duct adjacent to both sides of the duct drop. Install the ceiling damper in the duct drop using 3/16" (5) diameter by 1/2" (13) long steel bolts, #8 by 1/2" (13) sheet metal screws or 3/16" (5) diameter steel rivets at 6" (152) o.c. with 2 per side minimum for rectangular or square dampers. For round dampers, use three equally spaced #8 x 1/2" (13) sheet metal screws for dampers up to 10" (254) dia. and four for larger sizes.

5. Use No. 12 SWG galvanized steel wire hangers to independently support channels to the structural members of the floor or roof above.
6. Maximum damper size. Models 0714, 0716, 0716-4 and 0716-4A: 24" x 24" (610 x 610).
 Model 0716A: 16" x 16" (406 x 406). Model 0720: 18" x 18" (457 x 457).
 Model 0722: 24" (610) dia. Model 0722A: 16" (406) dia..

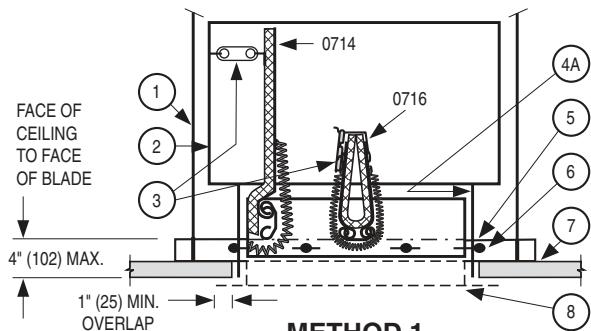
7. **Steel grille or diffuser installation:** Attach to the duct drop or ceiling damper using #8 by 1/2" (13) long sheet metal screws at 8" (203) o.c. maximum and at least one screw per side for rectangular or square dampers. Round neck grilles or diffusers shall be attached to the duct drop or ceiling damper using a minimum of four equally spaced #8 x 1/2" (13) sheet metal screws. The grille or diffuser flange face shall overlap the ceiling opening by 1" (25) minimum and provide structural support for the ceiling membrane.

Non-steel grille or diffuser installation: Duct drop requires a support flange as detailed on page 2. Grille or diffuser may be attached in any suitable manner.

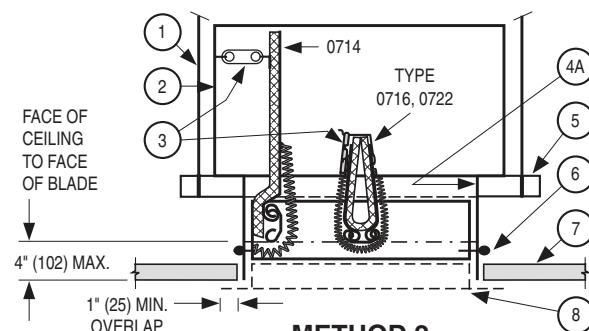
TYPICAL GRILLE/DIFFUSER APPLICATIONS



STEEL GRILLE OR DIFFUSER DETAIL

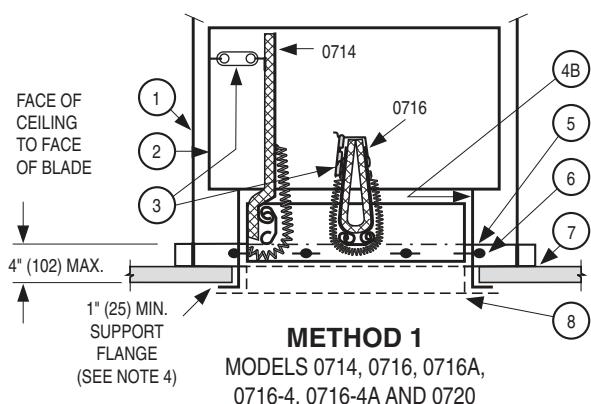


METHOD 1
MODELS 0714, 0716, 0716A,
0716-4, 0716-4A AND 0720

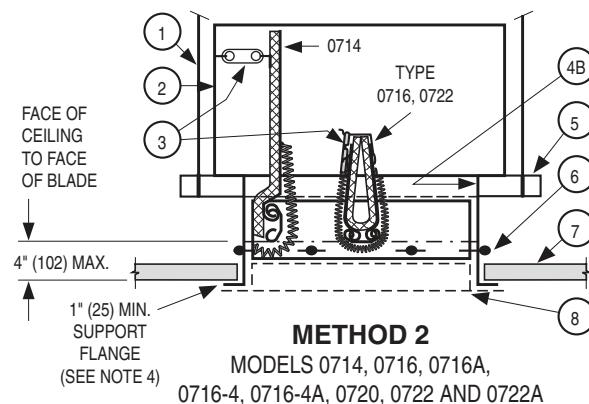


METHOD 2
MODELS 0714, 0716, 0716A,
0716-4, 0716-4A, 0720, 0722 AND 0722A

NON-STEEL GRILLE OR DIFFUSER DETAIL



METHOD 1
MODELS 0714, 0716, 0716A,
0716-4, 0716-4A AND 0720



METHOD 2
MODELS 0714, 0716, 0716A,
0716-4, 0716-4A, 0720, 0722 AND 0722A

ITEMS:

1. Wire hangers (4 required).
2. Main duct.
3. Listed fusible link or alt. listed adj. fusible link assembly. (Blade control through screw adjustment).
- 4a. Steel duct drop.
- 4b. Steel duct drop with 1" (25) lower support flange. The support flange may be integral to the duct drop or 1" x 1" (25 x 25) angles may be fastened to the duct drop at 4" (102) max. on center, min. two per side.
5. Support channels (2 required).
6. Mounting bolts, screws or rivets.
7. Ceiling: Acoustical panel (lay-in), acoustical tile or gypsum wallboard.
8. Grille or diffuser (see note 7).
9. Supplementary thermal blanket for use where ceiling opening is larger than nominal damper size. (See lay-in diffuser applications).

Dimensions are in inches (mm).

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**CEILING DAMPER, DIFFUSER AND THERMAL BLANKET ASSEMBLY
FOR LAY-IN INSTALLATION WITH FLEXIBLE OR STEEL DUCT****QUALIFICATIONS:**

- UL 555C Classified Ceiling Damper. (File # 9660).
- CAN4-S112.2 Ceiling Firestop Flap Assemblies.
- California State Fire Marshal: Fire Damper Listing No. 3225-0935:102.
- City of New York Board of Standards and Appeals. Cal. No. 460-88-SA.
- Meets the requirements for NFPA 90A, IBC, BOCA, SBCCI, UBC, NBC (Canada) and associated local building codes.

**NOTES:**

1. Follow carefully the installation procedure shown on page 2 for flexible duct and page 3 for hard duct.
2. Before installing, open damper blades and install link between spring loaded wire clips. Do not bend or deform clips after assembly. If dampers are provided with link tabs instead of wire clips, install link and bend tabs to secure link in position.
3. The end tabs of the 2'-0" (610) cross T-Bar shall be bent back against the web of the 4'-0" (1219) cross T-Bars. The 4'-0" (1219) cross T-Bars must have slots in the web for connection of the 2'-0" (610) cross T-Bar.
4. Use No. 12 SWG galvanized steel hanger wires to independently support the ceiling T-Bars to the structural members of the floor or roof above. Ensure hanger wires are plumb and straight.
5. Maximum distance from face of ceiling to face of damper blade is 4" (102).
6. Maximum size of the Ceiling Damper/Ceiling Air Diffuser neck is 12" x 12" (305 x 305) for square hard duct and 14" (356) dia. for flexible duct installations.
Larger neck sizes require the duct to be independently supported. See IOM pages 5.050-5.051.
The Flexible Duct shall be Class 0 or 1 bearing the UL Classification marking. The maximum length of the duct shall not exceed 14'-0" (4267) in length. No portion of the duct shall rest on the back surface of the ceiling panels or tiles and a minimum of 4" (102) clearance must be maintained. Where the duct must be supported, use straps or No. 12 SWG steel hanger wires 4'-0" (1219) to 6'-0" (1829) o.c.
7. Caution should be observed so that the duct does not interfere with the operation of the Classified Ceiling Damper of the Ceiling Air Diffuser assembly.
8. No Diffuser shall be located in an adjacent 24" x 48" (610 x 1219) ceiling grid module.
9. Ceiling Damper/Ceiling Air Diffuser assemblies are for use in lieu of the hinged blade, sheet metal damper in steel ducts as specified in the "Design Information Section - General", and in the individual floor and roof ceiling design(s) being used, as illustrated and described in the current UL "Fire Resistance Directory".

**CEILING DAMPER, DIFFUSER AND THERMAL BLANKET ASSEMBLY
FOR LAY-IN INSTALLATION WITH FLEXIBLE DUCT.
MODELS: 0722 & 0722A.**

Slip ceiling damper over neck of diffuser and install screws (item 5) on equally spaced centers.

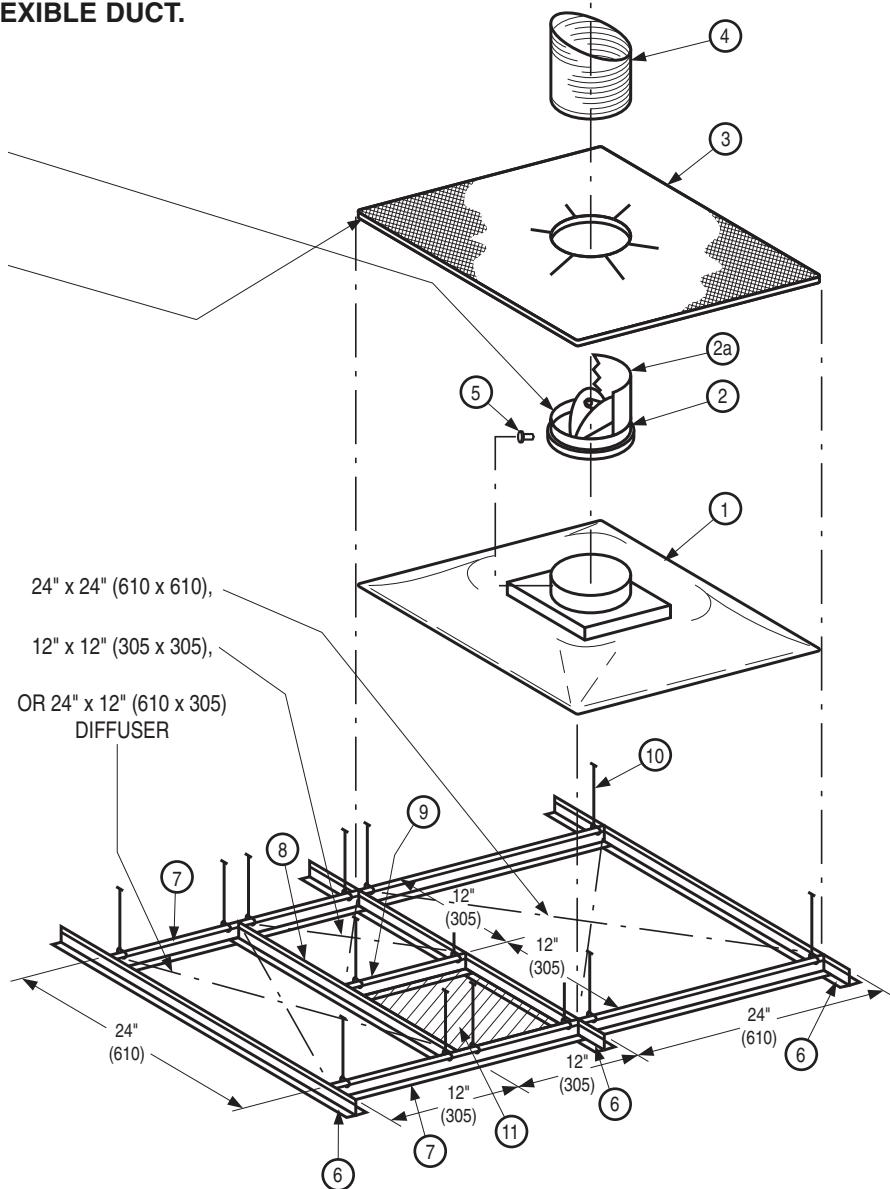
Place thermal blanket over ceiling damper and diffuser neck and set square with ceiling grid. Cut corners of blanket to clear hanger wires (item 10).

ITEMS:

1. Lay-in type steel diffuser with round neck or square-to-round adapter. (24 gauge minimum).
2. Ceiling damper.
- 2a. Ceiling damper with top extension.
3. Thermal blanket. (Model 0725).
4. UL Listed flexible duct.
5. #8 x 1/2" (13) sheet metal screws; equally spaced. Three required for 10" (254) dia. or less. Four required for 12" (305) and 14" (356) dia.
6. Main T-bar runner.
7. 4'-0" (1219) cross T-bar.
8. 2'-0" (610) T-bar.
9. 1'-0" (305) T-bar.
10. The 4 corners of the grid module in which the lay-in diffuser is installed shall have a hanger wire support.
11. Ceiling panel or tile set in ceiling grid.

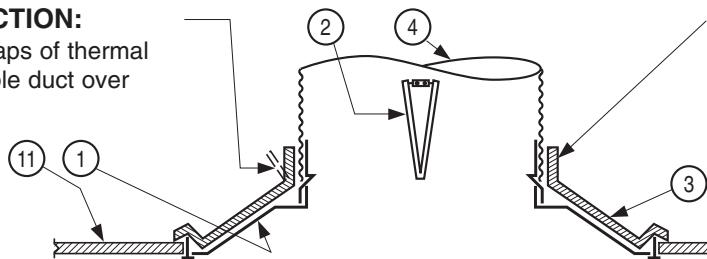
Combined diagram of typical ceiling grid layouts to suit 12" x 12" (305 x 305), 24" x 12" (610 x 305) or 24" x 24" (610 x 610) diffuser sizes as noted.

No diffusers shall be located in adjacent modules. Refer to notes on page 5.060.



DUCT CONNECTION:

Fold back neck flaps of thermal blanket, slip flexible duct over diffuser neck.



**THERMAL BLANKET
ATTACHMENT:**

Replace neck flaps of thermal blanket over duct and fasten duct to neck over blanket using 18 SWG min. steel wire or steel clamp in accordance with duct manufacturer's installation instructions. Do not use bolts, screws or rivets.

Dimensions are in inches (mm).

Page 2 of 4

**CEILING DAMPER, DIFFUSER AND THERMAL BLANKET ASSEMBLY
FOR LAY-IN INSTALLATION WITH RECTANGULAR STEEL DUCT.
MODELS: 0714, 0716, 0716A, 0716-4, 0716-4A & 0720.**

Slip ceiling damper over neck of diffuser and install screws (item 5) on equally spaced centers.

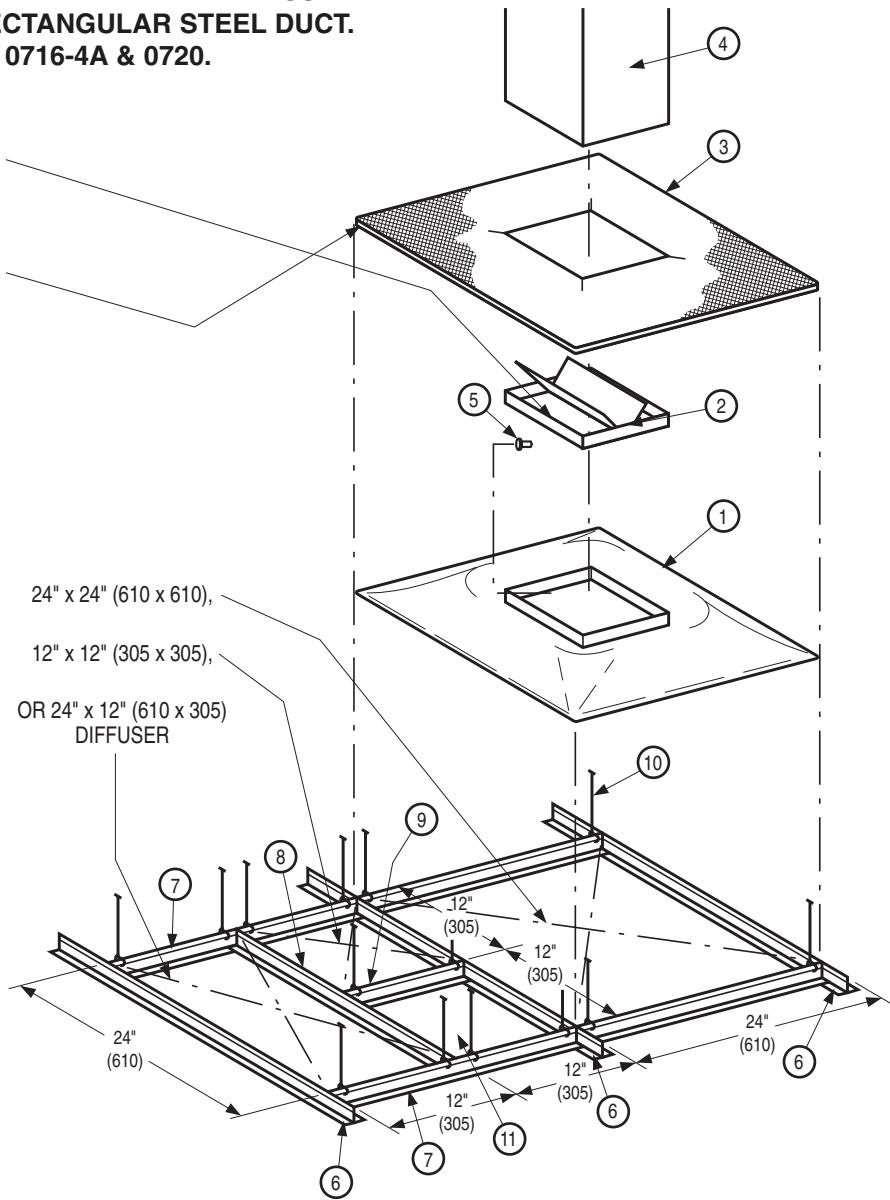
Place thermal blanket over ceiling damper and diffuser neck and set square with ceiling grid. Cut corners of blanket to clear hanger wires (item 10).

ITEMS:

1. Lay-in type steel diffuser with square or rectangular neck. (24 gauge min.).
2. Ceiling damper.
3. Thermal blanket. (Model 0726).
4. Steel duct drop.
5. #8 x 1/2" (13) sheet metal screws; equally spaced at 8" (203) o.c. maximum with at least one screw per side.
6. Main T-bar runner.
7. 4'-0" (1219) cross T-bar.
8. 2'-0" (610) T-bar.
9. 1'-0" (305) T-bar.
10. The 4 corners of the grid module in which the lay-in diffuser is installed shall have a hanger wire support.
11. Ceiling panel or tile set in ceiling grid.

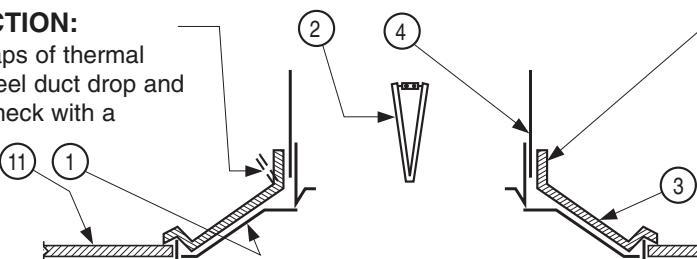
Combined diagram of typical ceiling grid layouts to suit 12" x 12" (305 x 305), 24" x 12" (610 x 305) or 24" x 24" (610 x 610) diffuser sizes as noted.

No diffusers shall be located in adjacent modules. Refer to notes on page 5.060.



DUCT CONNECTION:

Fold back neck flaps of thermal blanket, slip on steel duct drop and fasten to diffuser neck with a minimum of four #8 sheet metal screws, one per side.



**THERMAL BLANKET
ATTACHMENT:**

Replace neck flaps of thermal blanket over duct and fasten using 18 SWG steel wire.



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Receiving, Storage, Preparation:

Upon delivery, inspect shipping containers and contents closely. Note any damages on freight carrier's delivery receipt. Store dampers in a cool, dry and safe location in an orderly manner away from construction site, warehouse traffic, other materials, etc. Cover with plastic sheeting to protect from excessive moisture, dirt, and debris. Inspect dampers prior to installation. Dampers must be cleaned per procedures outlined in this document prior to installation if dirt, rust, or corrosion is observed.

Installation:

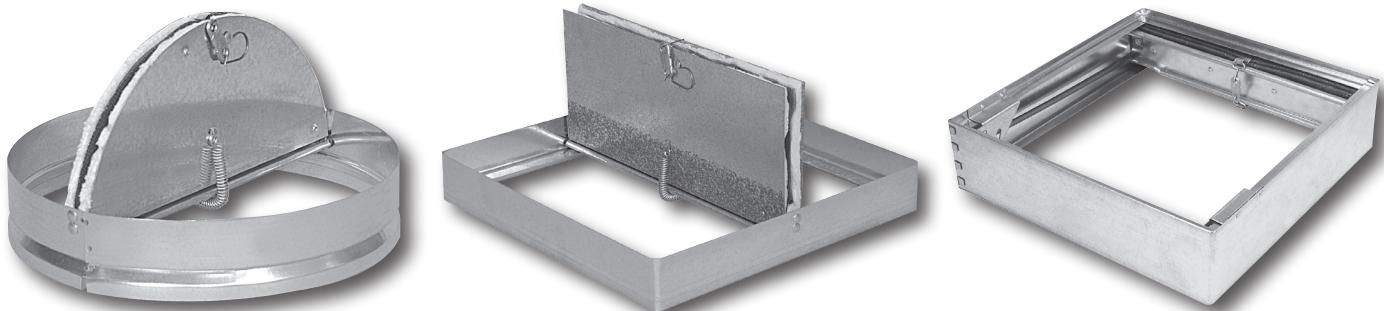
Life Safety Dampers are an essential part of the fire protection system in a building. Dampers must be installed per all applicable UL approved installation instructions. Fasteners must not interfere with the operation of the damper. Dampers must be held and supported by the frame. Holding or supporting dampers by the blades, blade hinges, or springs may result in damage. All CRD models are shipped from the factory with the blades closed. The fusible link must be installed at time of installation such that the blades are held open.

Maintenance:

Dampers do not typically require maintenance provided they are kept clean and dry. Additional lubrication is not required for all moving parts. If additional lubrication of blades is desired, use a silicone or dry graphite lubricant. Do not use petroleum-based lubricants or other lubricants that attract contaminants and collect dust. Use protective eyewear or safety glasses. Keep hands out of the blade path, as this can cause injury. Keep any hard objects or tools out of the blade path as they can damage the blades when closing.

Operations:

Remove any obstructions, dirt, rust, corrosion, or other observed conditions that could impede proper damper operation. Check closure springs (if applicable). If damaged or defective, repair or replace. Use hand tools to adjust dampers supplied with the volume control option, applying a maximum of 10 in.-lb. of torque to operate the controller. The function of the volume control option is for airflow adjustment and balancing at a grille/diffuser only, not intended for cycling the damper open and closed. Over adjustment of the volume control mechanism may cause damage to the damper assembly. When the fusible link separates the damper blades will close. Turning the volume control mechanism will no longer have an effect on the blades. If the fusible link has separated, it will need to be replaced.



Dimensions are in inches (mm).



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1. Control dampers are classified as follows:

With Seals: Single-skin Blades - 1010 Parallel, 1020 Opposed

Steel Airfoil Blades - 1110 Parallel, 1120 Opposed

Aluminum Airfoil Blades - 2010 Parallel, 2020 Opposed

No Seals: Single-skin Blades - 1012 Parallel, 1022 Opposed

Maximum single section size is 48" wide x 72" high (1219 x 1829) for all models except 2000 series which is 60" wide x 72" high (1524 x 1829).

2. Dampers larger than the maximum single section size are fabricated in multiple section assemblies. These assemblies consist of sections of equal size which are coupled together with a jackshaft. The jackshaft runs parallel to the "w" dimension.

A. 1/2" (13) Diameter Jackshaft:

- Used on two sections wide with a maximum of 32 sq. ft. with blade and jamb seals; or a maximum of 40 sq. ft. without seals.

B. 1" (25) Diameter Jackshaft:

- Used on two sections wide over 32 sq. ft. with blade and jamb seals; or over 40 sq. ft. without seals.

- Used on assemblies of more than two sections wide, regardless of area.

Maximum Section Size for all Multiple Section Dampers: 48" wide x 72" high (1219 x 1829).

3. Use the details on page 2 and 3 to determine how multiple section dampers with standard construction and sizes up to 240" wide x 144" high (6086 x 3658) will be manufactured. Details do not apply if the control damper has any of the following non-standard features:

A. Unequal section sizes.

B. Face and By-pass arrangement.

For sizes larger than 240" x 144" (6096 x 3658), consult factory.

4. How to determine your damper configuration:

A. Calculate the damper area in square feet:

$$\text{Area} = \frac{(\text{W in. wide} \times \text{H in. high})}{144} \text{ sq. ft.}$$

B. Based on the W and H dimensions and the area of your damper, determine the appropriate assembly detail using the chart on page 2.

Example: Model 1020 (with seals) 96" wide x 96" high.

$$\text{Area} = \frac{(96 \times 96)}{144} = 64 \text{ sq. ft.} \quad \text{From chart and drawings, damper configuration is per detail 22Q. Your damper will be built this way.}$$

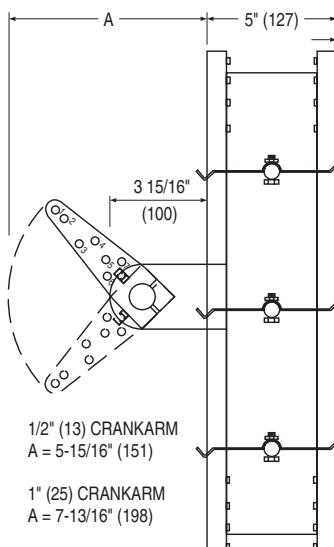
5. Multiple section assemblies require bracing to support the weight of the assembly and to hold against system pressure.

Appropriate bracing must support the damper horizontally at least once for every 8 ft.(2438) of damper width.

Vertical assemblies and higher system pressures require more bracing.

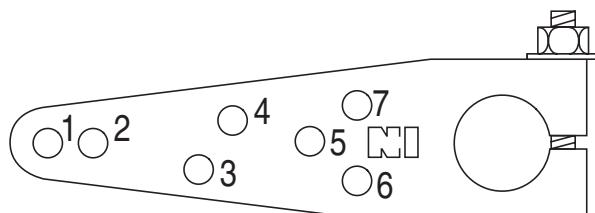
6. The maximum shipping size is 96" x 72" (2438 x 1829) or two sections wide. Larger units are shipped in sections for field assembly. Refer to the Control Damper Installation Instructions on page 4 for joining multiple sections.

7. Optional 1/2" (13) dia. and 1" (25) dia. crankarms are available for field applications that utilize linear type actuators (usually pneumatic). You can order the crankarms illustrated below (at additional cost) by the associated part number.



CLEARANCE REQUIREMENTS

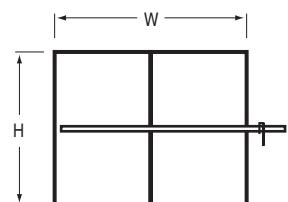
1/2" (13) DIA. CRANK ARM (OPTIONAL)
 PART NO. CD005



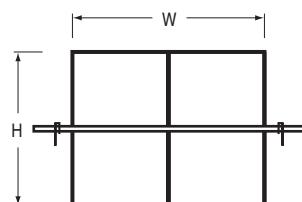
1" (25) DIA. CRANK ARM (OPTIONAL)
 PART NO. CD010

HOLE NO.	CRANK ARM RADIUS
8	1 3/8" (35)
7	1 9/16" (40)
6	1 9/16" (40)
5	2" (51)
4	2 13/16" (72)
3	3 3/16" (81)
2	4 1/4" (108)
1	4 3/4" (121)

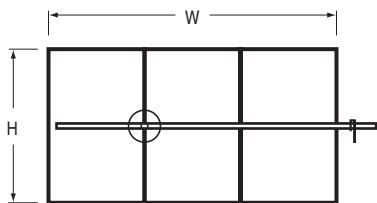
DIMENSION "W" WIDTH IN INCHES (mm)							
DIMENSION "H" HEIGHT IN INCHES (mm) ↓	ALL MODEL SERIES	1000 AND 1100 SERIES ONLY	2000 SERIES ONLY		ALL MODEL SERIES		
	48" (1219) AND UNDER	OVER 48" (1219) THRU 96" (2438)	OVER 48" (1219) THRU 60" (1524)	OVER 60" (1124) THRU 96" (2438)	OVER 96" (2438) THRU 144" (3658)	OVER 144" (3658) THRU 192" (4877)	OVER 192" (4877) THRU 240" (6096)
72" (1829) AND UNDER	-	DETAIL 21 S OR D	-	DETAIL 21 S OR D	DETAIL 31 S OR D	DETAIL 41 S OR D	DETAIL 51 S OR D
OVER 72" (1829) THRU 144" (3658)	DETAIL 12 S OR D	DETAIL 22 S, D OR Q		DETAIL 22 S, D or Q	DETAIL 32 D OR Q	DETAIL 42 D OR Q	DETAIL 52 D OR Q



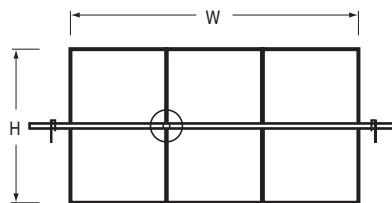
DETAIL 21S
25 SQ. FT. AND UNDER WITH SEALS
48 SQ. FT. AND UNDER NO SEALS



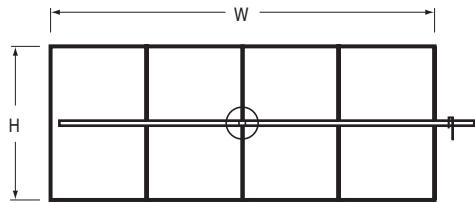
DETAIL 21D
OVER 25 THRU 48 SQ. FT. WITH SEALS



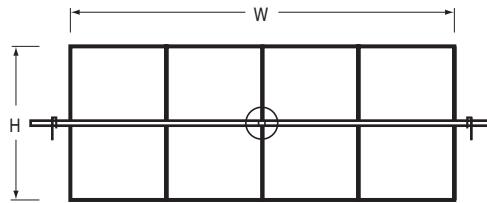
DETAIL 31S
25 SQ. FT. AND UNDER WITH SEALS
50 SQ. FT. AND UNDER NO SEALS



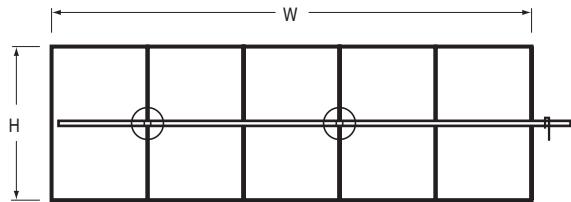
DETAIL 31D
OVER 25 THRU 50 SQ. FT. WITH SEALS
OVER 50 THRU 72 SQ. FT. NO SEALS



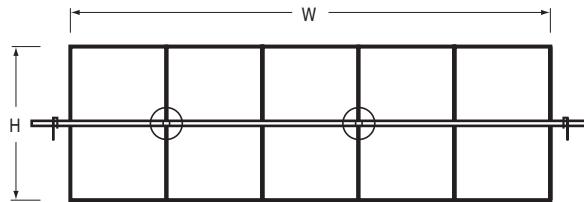
DETAIL 41S
25 SQ. FT. AND UNDER WITH SEALS
50 SQ. FT. AND UNDER NO SEALS



DETAIL 41D
OVER 25 THRU 96 SQ. FT. WITH SEALS
OVER 50 THRU 96 SQ. FT. NO SEALS

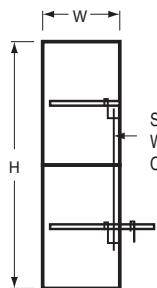


DETAIL 51S
25 SQ. FT. AND UNDER WITH SEALS
50 SQ. FT. AND UNDER NO SEALS

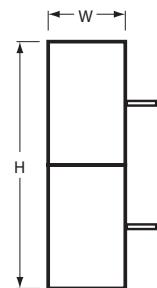


DETAIL 51D
OVER 25 THRU 120 SQ. FT. WITH SEALS
OVER 50 THRU 120 SQ. FT. NO SEALS

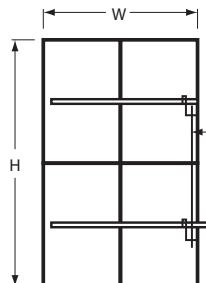
NOTE:  INDICATES LOCATION OF JACKSHAFT COUPLING.



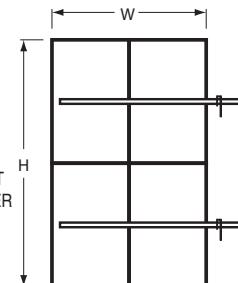
DETAIL 12S
25 SQ. FT. AND UNDER WITH SEALS
48 SQ. FT. AND UNDER NO SEALS



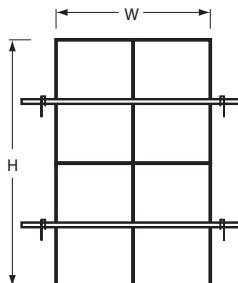
DETAIL 12D
OVER 25 THRU 48 SQ. FT. WITH SEALS
SUPPLIED WITH 1/2" DIA. EXTENDED SHAFTS (NO JACKSHAFTS)



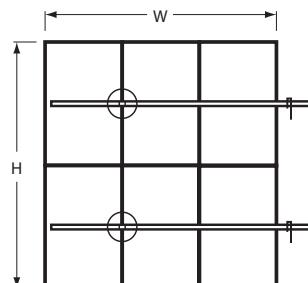
DETAIL 22S
OVER 24 THRU 25 SQ. FT. WITH SEALS
OVER 24 THRU 50 SQ. FT. NO SEALS



DETAIL 22D
OVER 25 THRU 50 SQ. FT. WITH SEALS
OVER 50 THRU 96 SQ. FT. NO SEALS

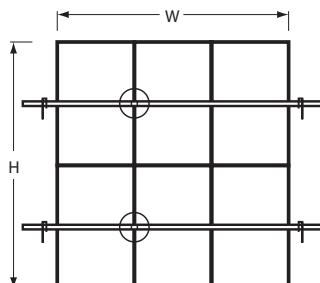


DETAIL 22Q
OVER 50 THRU 96 SQ. FT. WITH SEALS

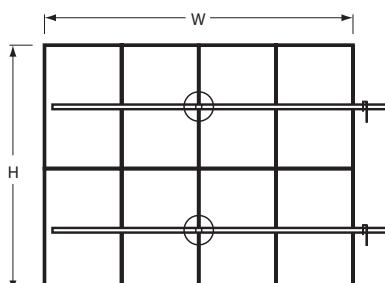


DETAIL 32D
OVER 48 THRU 50 SQ. FT. WITH SEALS
OVER 48 THRU 100 SQ. FT. NO SEALS

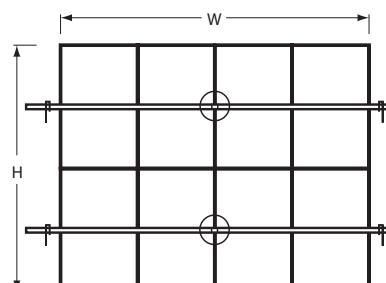
NOTE:  INDICATES LOCATION OF JACKSHAFT COUPLING.



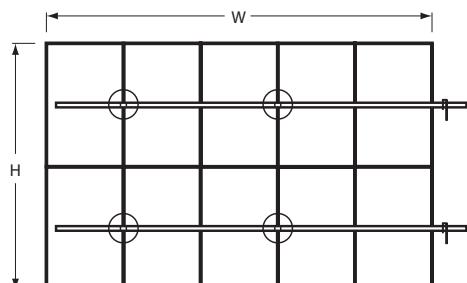
DETAIL 32Q
OVER 50 THRU 144 SQ. FT. WITH SEALS
OVER 100 THRU 144 SQ. FT. NO SEALS



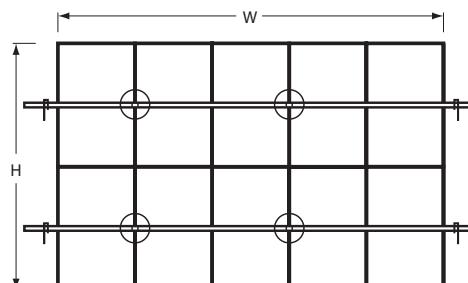
DETAIL 42D
OVER 72 THRU 100 SQ. FT. NO SEALS



DETAIL 42Q
OVER 72 THRU 192 SQ. FT. WITH SEALS
OVER 100 THRU 192 SQ. FT. NO SEALS



DETAIL 52D
OVER 96 THRU 100 SQ. FT. NO SEALS



DETAIL 52Q
OVER 96 THRU 240 SQ. FT. WITH SEALS
OVER 100 THRU 240 SQ. FT. NO SEALS

INSTALLATION INSTRUCTIONS

RECEIVING/INSPECTION

Upon delivery, inspect shipping containers and dampers carefully. Note any damage on trucker's delivery receipt. Contact the freight company within 24 hours for inspection. Do not install dampers. It is easier to repair on the floor than in the duct.

STORAGE

Store in an orderly manner. Do not pile dampers on each other. Cover with plastic sheeting to protect from excessive moisture, dirt and debris. Avoid unnecessary handling of dampers.

INSTALLATION

Handle dampers by frame only. Do not lift by blades, linkage, actuator or jackshaft. Use sufficient people to evenly lift multiple section assemblies. Do not drop, drag, step on, or apply excessive bending, twisting or racking. Cycle dampers by hand before installation to ensure freedom of movement.

1. Inspect ductwork or opening where damper will be installed for any obstructions and to ensure it is straight and level. It is essential to support ductwork to prevent sagging due to damper weight.
2. Determine location of extended drive shaft or jackshaft before installation.
3. Position damper shipping sections together in duct or opening. Align and match frame markings on adjacent sections (see fig. 1).
4. Align holes on adjacent frame sections and fasten together on front and back sides with screws or nuts and bolts.
5. Use shims as appropriate between damper frame and duct opening and between damper sections as necessary to prevent distortion of frame by fasteners. Ensure fasteners do not interfere with blade movement or damper linkage. Bracing is required at every horizontal mullion for strength and to support weight. Vertical bracing is recommended at every 8 feet minimum of damper width for strength. Dampers in high velocity and/or high pressure systems require more bracing.
6. If the damper assembly is supplied with unjoined jackshafting and is operated by only one actuator, join jackshaft ends using coupling and set screws or nuts and bolts provided (see fig. 2).
7. If applicable, connect lower and upper jackshafts with the connecting rod crossover supplied, through the swivel on crank arm at each jackshaft. Locate crank arm close to a jackshaft bearing bracket and not centrally in order to minimize play (see fig. 2).
8. Ensure dampers are set completely square, plumb and free from racking, twisting or bending and are free to operate without binding (see fig. 3). A clearance must be maintained between blade and blade bearing. Move blade solidly to one side against bearing and measure clearance at other end. If jamb seals are present, compress to determine clearance. Dampers must operate without binding. Before system operation, cycle damper after installation to assure proper operation. On multiple section assemblies, (with jackshaft coupling) all sections should open and close simultaneously.
9. After installation of low leakage dampers with seals, caulk between frame and duct or opening to prevent leakage.

1/2" (13)
COUPLING
DETAIL

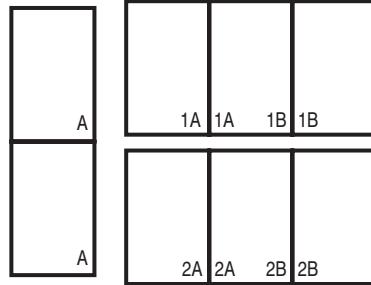
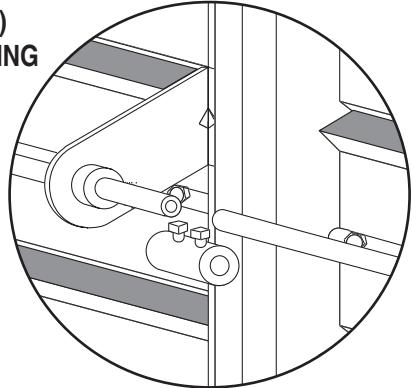
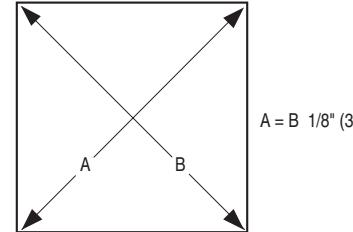


FIGURE 1.



Individual damper sections and multiple assemblies must be square.
Both dimensions across the diagonal must be equal $\pm 1/8"$ (3).

FIGURE 3.

1" (25)
COUPLING
DETAIL

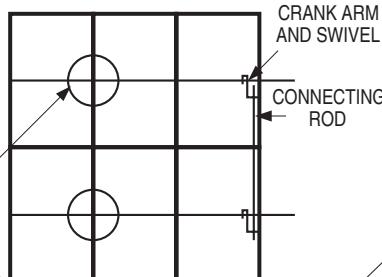
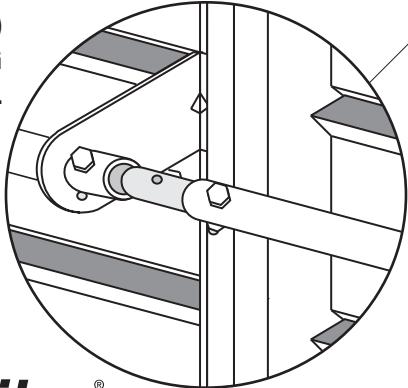


FIGURE 2.

FASTENERS:
USE SM SCREWS
OR
NUTS & BOLTS.
DO NOT
DISTORT FRAME.
USE SHIMS
AS NECESSARY.

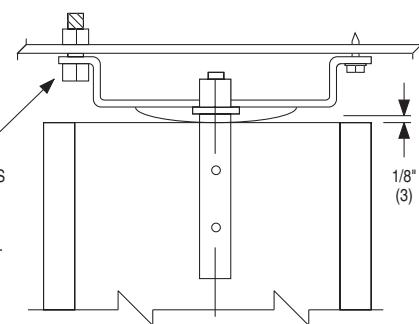


FIGURE 4.



OPERATION AND MAINTENANCE PROCEDURES

CONTROL DAMPERS

MODEL SERIES: 1000, 1100 AND 2000

Damper Maintenance

The following maintenance is recommended in order to prolong damper life cycle and ensure smooth and proper operation. It is recommended to perform the damper maintenance annually, however, the maintenance period may increase in unfiltered systems where accumulation of foreign matter occurs at an increased rate. Over time, the accumulation of foreign matter creates a bond that affects operation of moving parts. This can translate to an increased torque of up to two or three times the normal operating torque.

1. Remove any accumulation, obstructions, dirt, rust, corrosion or other observed conditions that could impede proper damper operation. Clean the damper blades and other moving parts if necessary. Use of a SOS pads is recommended for cleaning.
2. Tiebar linkage and jackshaft bearing brackets should be lubricated with a dry lubricant (such as T.F.E. Dry Lube) if necessary. Never use a regular lubricating oil on dampers, as it will attract dirt and grit. Inter-connecting blade linkage on Nailor dampers is usually concealed in the side jamb out of the airstream and is maintenance free. (Optional face linkage is non-adjustable, but should be lubricated).
3. Refer to the manufacturers recommended maintenance procedure for pneumatic and electric actuators.

1. Thermally Broken Control Dampers are classified as follows:

With Thermally Broken Frames — 2200TBF

Without Thermally Broken Frames — 2200TB

Maximum single section size is 60" wide x 78" high (1524 x 1981) for Hat Channel (HC) Frame.

Maximum single section size is 60" wide x 76" high (1524 x 1930) for Quick Connect (QC) Frame.

2. Dampers larger than the maximum single section size are fabricated in multiple section assemblies. These assemblies consist of sections of equal size which are coupled together with a jackshaft. The jackshaft runs parallel to the width ("w") dimension. This jackshaft configuration is not available to Quick Connect Dampers.

A. 1/2" (13) Diameter Jackshaft:

- Used on two sections wide with a maximum of 32 sq. ft. with blade and jamb seals.

B. 1" (25) Diameter Jackshaft:

- Used on two sections wide over 32 sq. ft. with blade and jamb seals.
- Used on assemblies of more than two sections wide, regardless of area.

Maximum Section Size for Hat Channel Multiple Section Dampers: 60" wide x 78" high (1524 x 1981).

Maximum Section Size for Quick Connect Multiple Section Dampers: 60" wide x 76" high (1524 x 1930).

Maximum Multi-Section Size for Quick Connect Dampers: 96" wide x 152" high (2438 x 3860).

3. Use the details on page 2 and 3 to determine how multiple section dampers with standard construction and sizes up to 240" wide x 234" high (6096 x 5943) will be manufactured. Details do not apply if the control damper has any of the following non-standard features:

A. Unequal section sizes.

B. Face and By-pass arrangement.

For sizes larger than 240" x 234" (6096 x 5943), consult factory.

4. How to determine your damper configuration:

A. Calculate the damper area in square feet:

$$\text{Area} = \frac{(\text{W in. wide} \times \text{H in. high})}{144} \text{ sq. ft.}$$

B. Based on the W and H dimensions and the area of your damper, determine the appropriate assembly detail using the chart on page 2.

Example: Model 2200TBF 96" wide x 96" high.

$$\text{Area} = \frac{(96 \times 96)}{144} = 64 \text{ sq. ft.}$$

From chart and drawings, damper configuration is per detail 22Q.
Your Damper will be built this way.

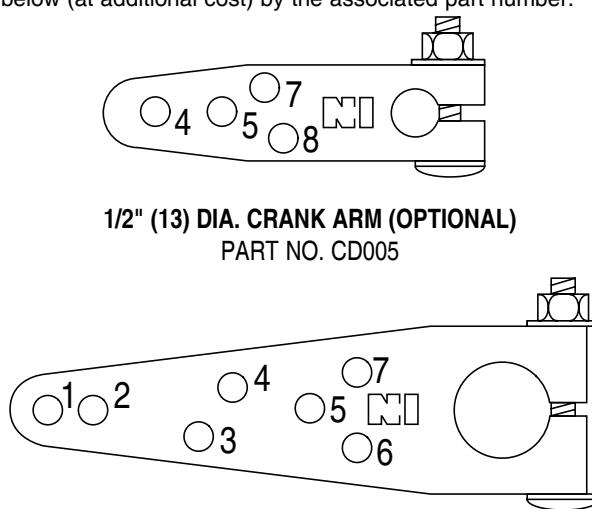
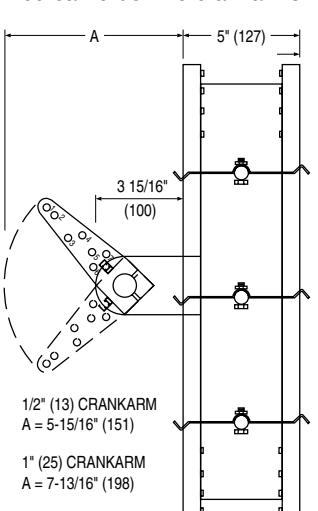
5. Multiple section assemblies require bracing to support the weight of the assembly and to hold against system pressure.

Appropriate bracing must support the damper horizontally at least once for every 8 ft.(2438) of damper width.

Vertical assemblies and higher system pressures require more bracing.

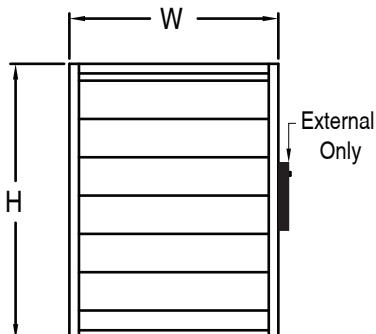
6. The maximum shipping size is 120" x 78" (3048 x 1981) or two sections wide. Larger units are shipped in sections for field assembly. Refer to the Control Damper Installation Instructions on page 4 for joining sections.

7. Optional 1/2" (13) dia. and 1" (25) dia. crankarms are available for field applications that utilize linear type actuators (usually pneumatic). You can order the crankarms illustrated below (at additional cost) by the associated part number.

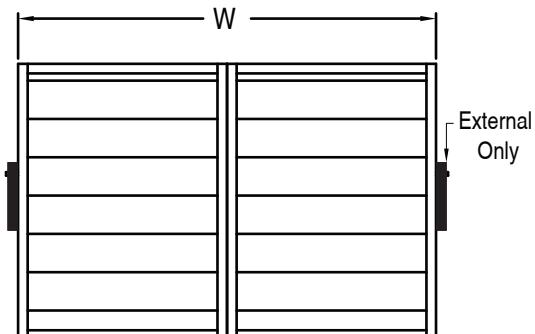


HOLE NO.	CRANK ARM RADIUS
8	1 3/8" (35)
7	1 9/16" (40)
6	1 9/16" (40)
5	2" (51)
4	2 13/16" (72)
3	3 3/16" (81)
2	4 1/4" (108)
1	4 3/4" (121)

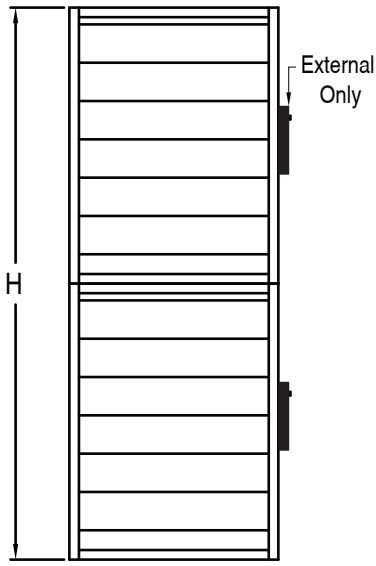
DIMENSION "H" HEIGHT IN INCHES (mm)	DIMENSION "W" WIDTH IN INCHES (mm)				Note: Number of actuators and actuator selection is dependent on damper square footage.
	THRU 60" (1524)	OVER 60" (1524)	OVER 120" (3048)	OVER 180" (4572)	
76" (1930) AND UNDER	DETAIL 11 Q	DETAIL 21 Q	-	-	
152" (3861) AND UNDER	DETAIL 12 Q	DETAIL 22 Q	-	-	



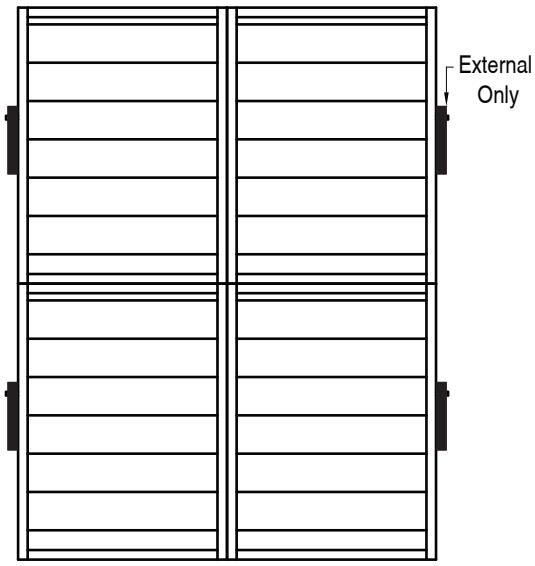
Detail 11Q
Single Section



Detail 21Q
2 Sections Wide
2 Actuators, 1 per section



Detail 12Q
2 Sections Tall

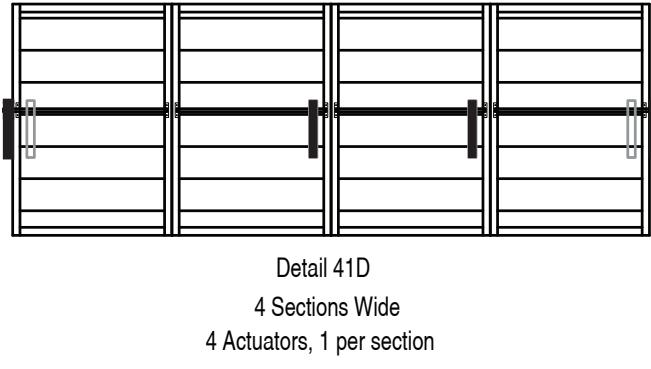
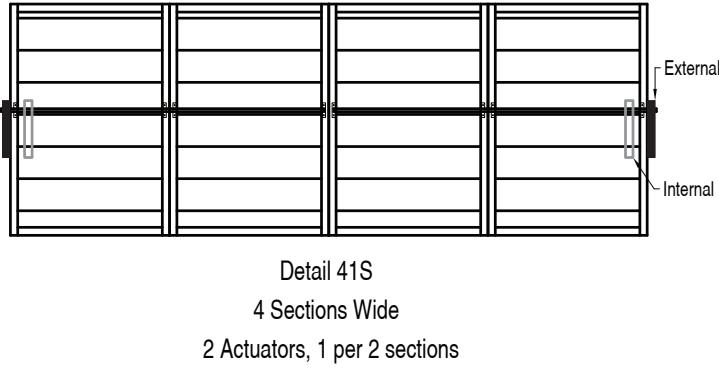
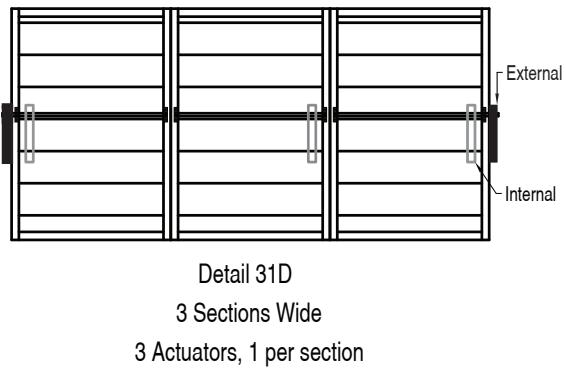
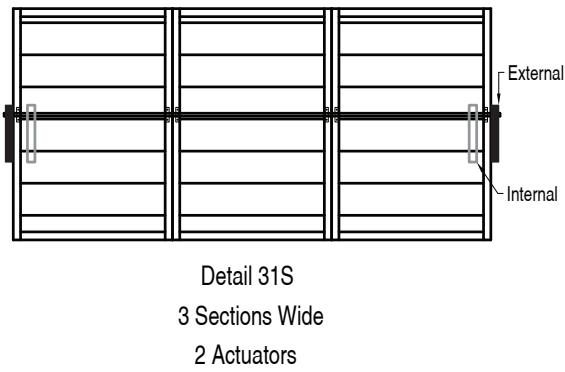
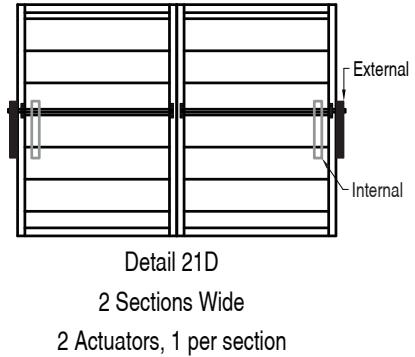
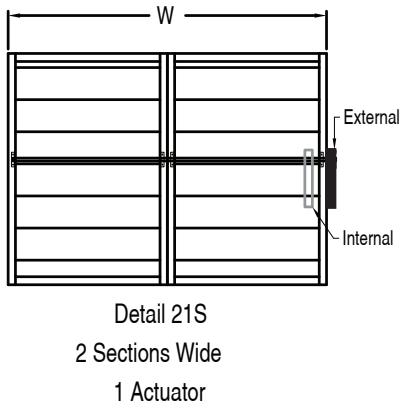
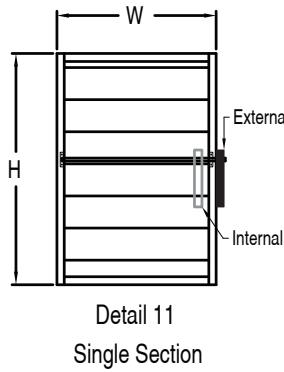


Detail 22Q
2 Sections Wide
2 Sections Tall
4 Actuators, 1 per section

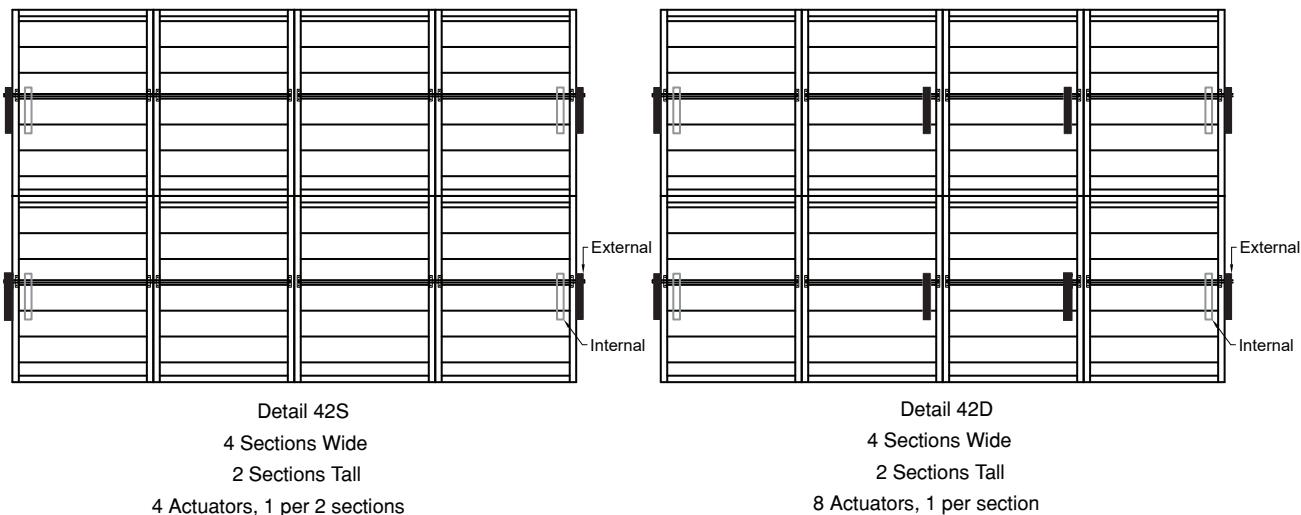
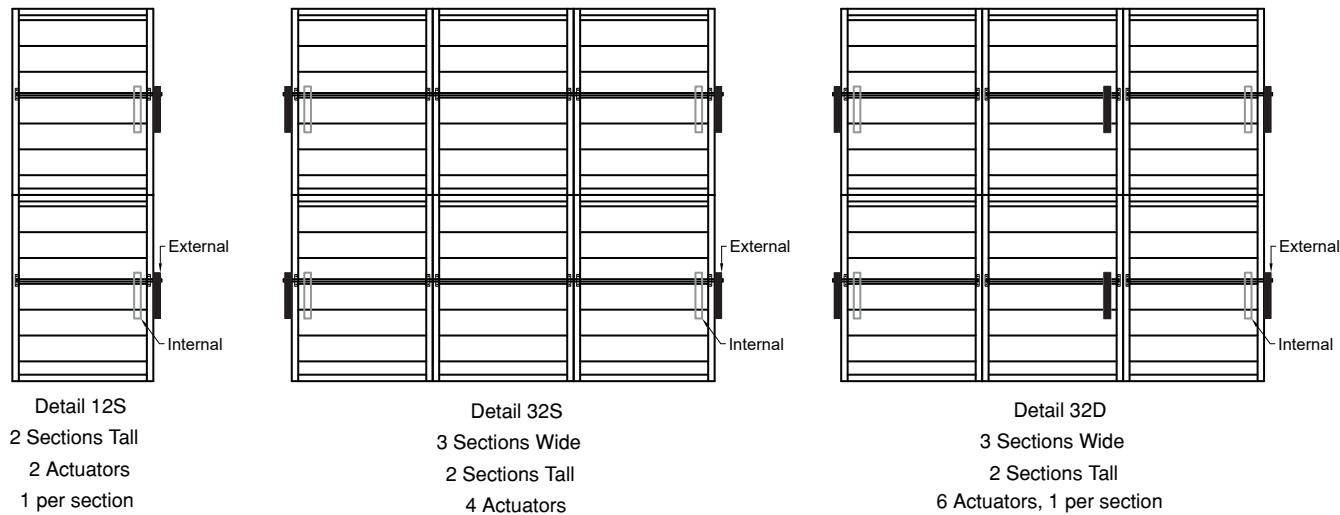
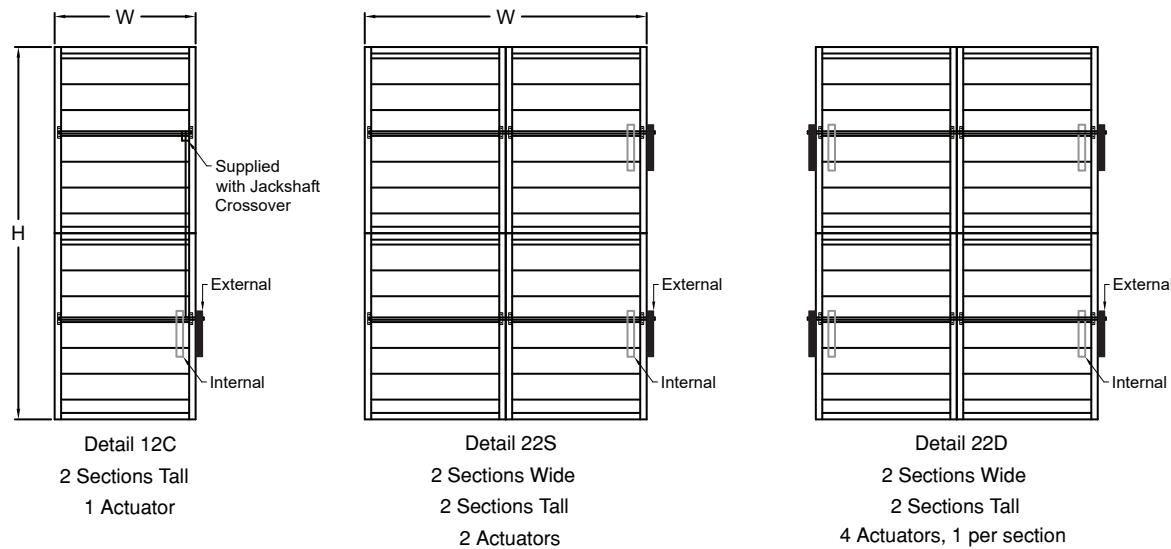
Note: Jackshafts are not available for Quick Connect Dampers.

Page 2 of 6

DIMENSION "H" HEIGHT IN INCHES (mm)	DIMENSION "W" WIDTH IN INCHES (mm)				Note: Number of actuators and actuator selection is dependent on damper square footage.
	THRU 60" (1524)	OVER 60" (1524)	OVER 120" (3048)	OVER 180" (4572)	
78" (1981) AND UNDER	DETAIL 11 Q	DETAIL 21 S or D	DETAIL 31 S or D	DETAIL 41 S or D	
156" (3962) AND UNDER	DETAIL 12 S or C	DETAIL 22 S or D	DETAIL 32 S or D	DETAIL 42 S or D	



NOTE: Couplings shall be provided to allow jackshaft connections for dampers over 2 sections wide.



INSTALLATION INSTRUCTIONS

RECEIVING/INSPECTION

Upon delivery, inspect shipping containers and dampers carefully. Note any damage on trucker's delivery receipt. Contact the freight company within 24 hours for inspection. Do not install dampers. It is easier to repair on the floor than in the duct.

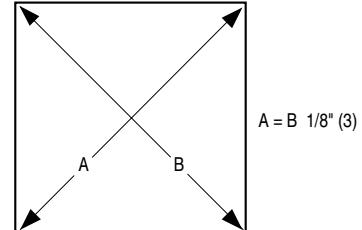
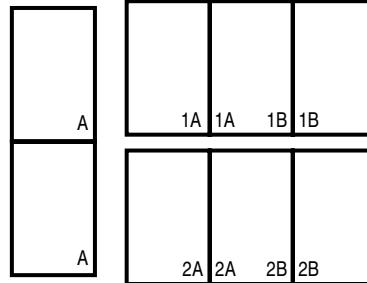
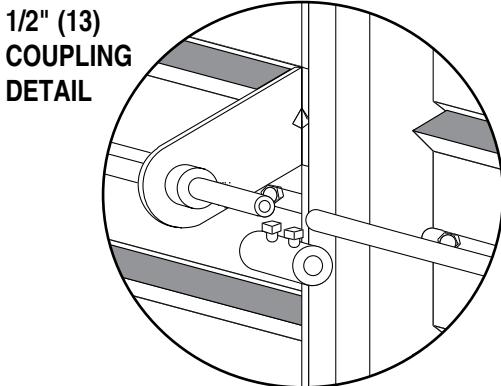
STORAGE

Store in an orderly manner. Do not pile dampers on each other. Cover with plastic sheeting to protect from excessive moisture, dirt and debris. Avoid unnecessary handling of dampers.

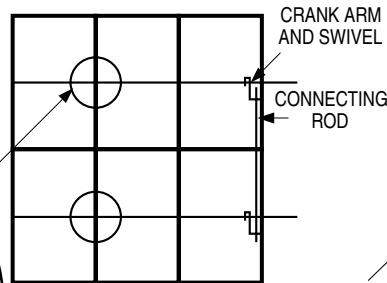
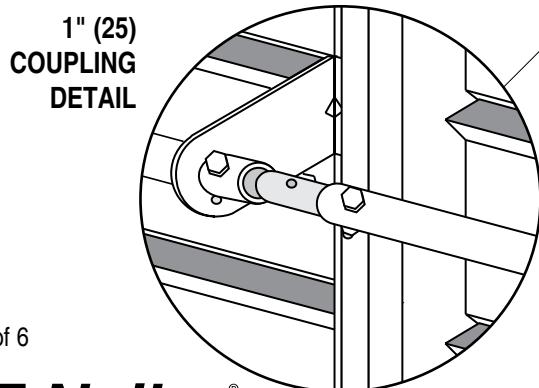
INSTALLATION

Handle dampers by frame only. Do not lift by blades, linkage, actuator or jackshaft. Use sufficient people to evenly lift multiple section assemblies. Do not drop, drag, step on, or apply excessive bending, twisting or racking. Cycle dampers by hand before installation to ensure freedom of movement.

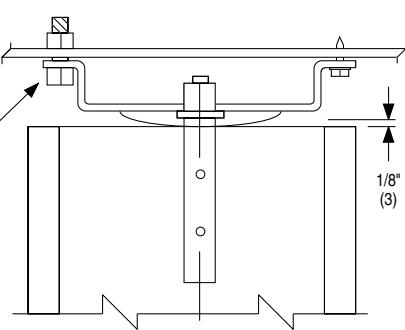
1. Inspect ductwork or opening where damper will be installed for any obstructions and to ensure it is straight and level.
It is essential to support ductwork to prevent sagging due to damper weight.
2. Determine location of extended drive shaft or jackshaft before installation.
3. Position damper shipping sections together in duct or opening. Align and match frame markings on adjacent sections (see fig. 1).
4. Align holes on adjacent frame sections and fasten together on front and back sides with screws or nuts and bolts.
5. Use shims as appropriate between damper frame and duct opening and between damper sections as necessary to prevent distortion of frame by fasteners. Ensure fasteners do not interfere with blade movement or damper linkage. Bracing is required at every horizontal mullion for strength and to support weight. Vertical bracing is recommended at every 8 feet minimum of damper width for strength. Dampers in high velocity and/or high pressure systems require more bracing.
6. If the damper assembly is supplied with unjoined jackshafting and is operated by only one actuator, join jackshaft ends using coupling and set screws or nuts and bolts provided (see fig. 2).
7. If applicable, connect lower and upper jackshafts with the connecting rod crossover supplied, through the swivel on crank arm at each jackshaft. Locate crank arm close to a jackshaft bearing bracket and not centrally in order to minimize play (see fig. 2).
8. Ensure dampers are set completely square, plumb and free from racking, twisting or bending and are free to operate without binding (see fig. 3). A clearance must be maintained between blade and blade bearing. Move blade solidly to one side against bearing and measure clearance at other end. If jamb seals are present, compress to determine clearance. Dampers must operate without binding. Before system operation, cycle damper after installation to assure proper operation. On multiple section assemblies, (with jackshaft coupling) all sections should open and close simultaneously.
9. After installation of low leakage dampers with seals, caulk between frame and duct or opening to prevent leakage.



Individual damper sections and multiple assemblies must be square.
Both dimensions across the diagonal must be equal $\pm 1/8"$ (3).



FASTENERS:
USE S/M SCREWS
OR
NUTS & BOLTS.
DO NOT
DISTORT FRAME.
USE SHIMS
AS NECESSARY.



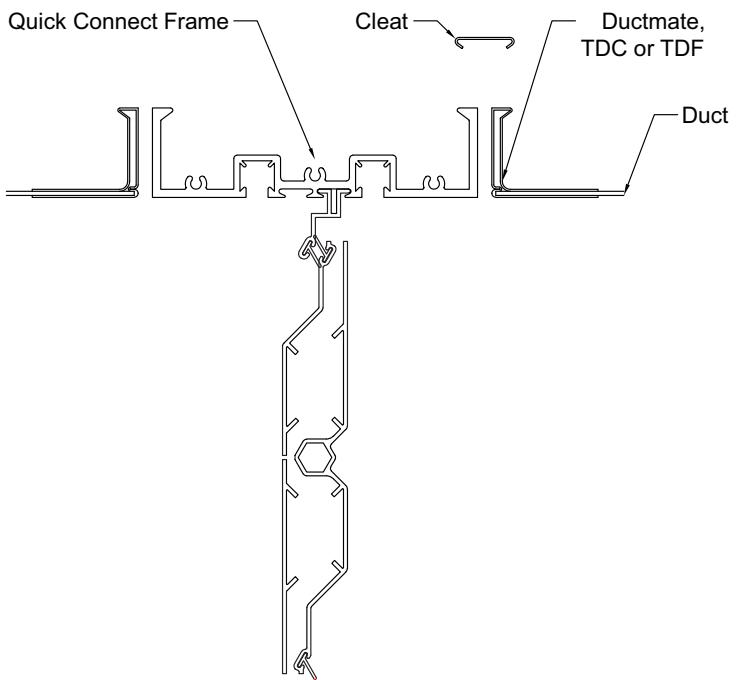
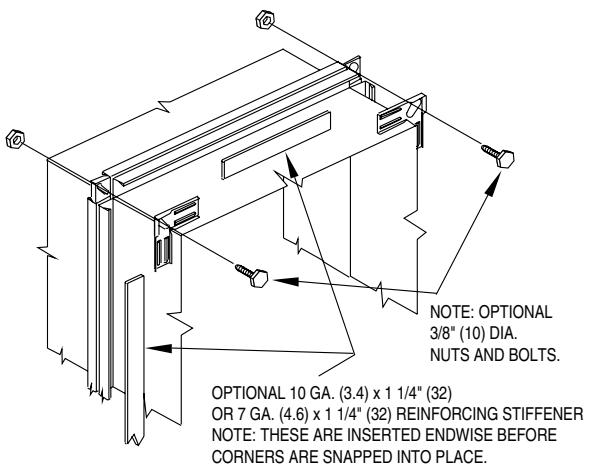
QUICK CONNECT MOUNTING & INSTALLATION

1. Seal the two flange systems together with either a sealant or a gasket.
2. Align the quick connect frame and the flange assembly. 3/8 in. (9mm) bolts may be used in the corners to help align the dampers. These bolts do not need to be removed.
3. Install the metal cleat (See figure) or #10 TEK screw with the following recommended spacing:

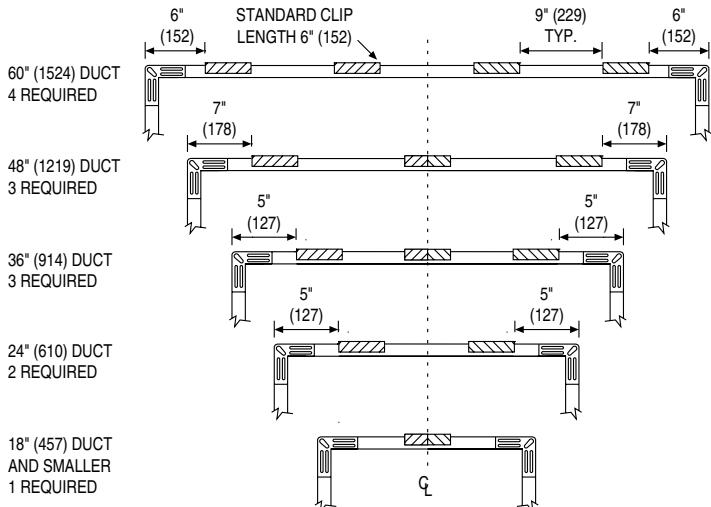
Width or Height	# of screws or cleats per side
≤ 18 in. (457mm)	1
> 18 in. ≤ 24 in. (457 – 610mm)	2
> 24 in. ≤ 48 in. (610 – 1220mm)	3
> 48 in. ≤ 60 in. (1220 – 1524mm)	4
> 60 in. ≤ 72 in. (1524 – 1829mm)	5

INSTALLATION:

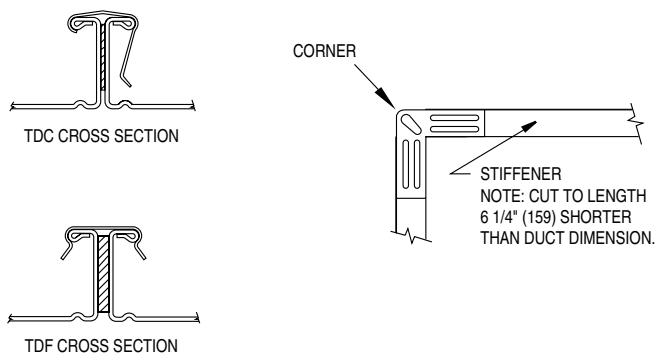
TDC and TDF roll-formed 4-bolt flanged connections assembled per the manufacturer's instructions using gaskets, metal cleats 6" (152) long with spacing as shown and four 3/8" (9.5) metal nuts and bolts. See also the TDC or TDF addendum to the SMACNA Duct Construction Standards.



RECOMMENDED CLIP SPACING



CLEAT DETAILS



RECEIVING/INSPECTION

Upon delivery, inspect shipping containers and dampers carefully. Note any damage on trucker's delivery receipt. Contact the freight company within 24 hours for inspection. Do not install dampers. It is easier to repair on the floor than in the duct.

STORAGE

Store in an orderly manner. Do not pile dampers on each other. Cover with plastic sheeting to protect from excessive moisture, dirt and debris. Avoid unnecessary handling of dampers.

GENERAL INSTALLATION

Handle and lift dampers by frame only. Do not lift by blades or linkage. Use sufficient people and appropriate rigging (if required) to evenly lift multiple section assemblies. Do not drop, drag or twist dampers. Inspect ductwork or opening where damper will be installed for any obstructions and to ensure it is straight and level. Ductwork should be supported to prevent sagging due to damper weight. Ensure dampers are installed completely square and plumb, and that blades are free to operate without binding. Use shims as appropriate between damper frame and duct opening to prevent distortion of the frame by fasteners. Care must be taken to ensure that any fasteners used do not interfere with linkage or blade operation. If applicable, counterbalance assembly must be adjusted for damper to open at desired pressure.

MULTIPLE SECTION ASSEMBLIES

Backdraft dampers larger than single section maximum sizes will be manufactured in equal size sections and must be assembled together in the field. Assemble sections together as shown in Figures 1 and 2 using 1/4" (6) - 20 bolts and locknuts or #10 Tek screws (fasteners by others) spaced on approximately 6" (152) centers. In addition, for single section high dampers install 10" (254) long x 1/16" (1.6) thick aluminum plates on top and bottom, as shown in Figures 1 and 3, using #8 Tek screws or AAP-64 rivets, or similar. For multiple section high dampers install aluminum plates on top, bottom and sides as shown in Figure 2. For larger size dampers not shown follow the same methods. Additional bracing (by others) may be required to support the weight of the assembly and to resist system pressure.

IMPORTANT: BE SURE ALL FASTENERS (BY OTHERS) DO NOT INTERFERE WITH DAMPER LINKAGE AND BLADE OPERATION!

FIGURE 1:

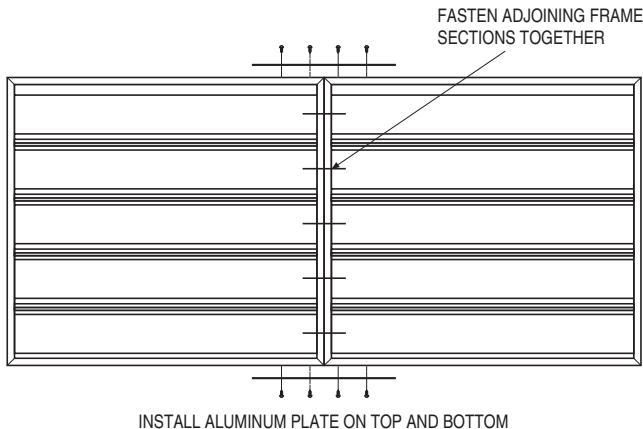
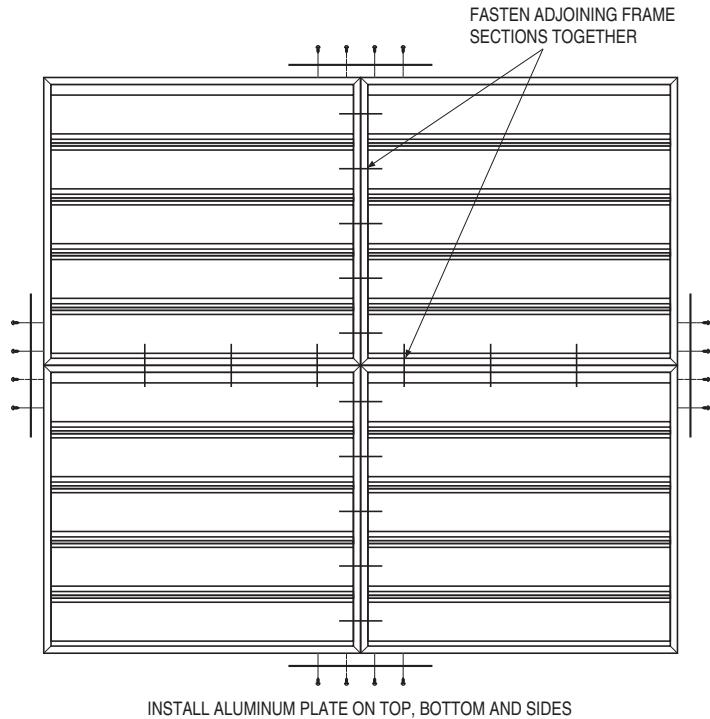
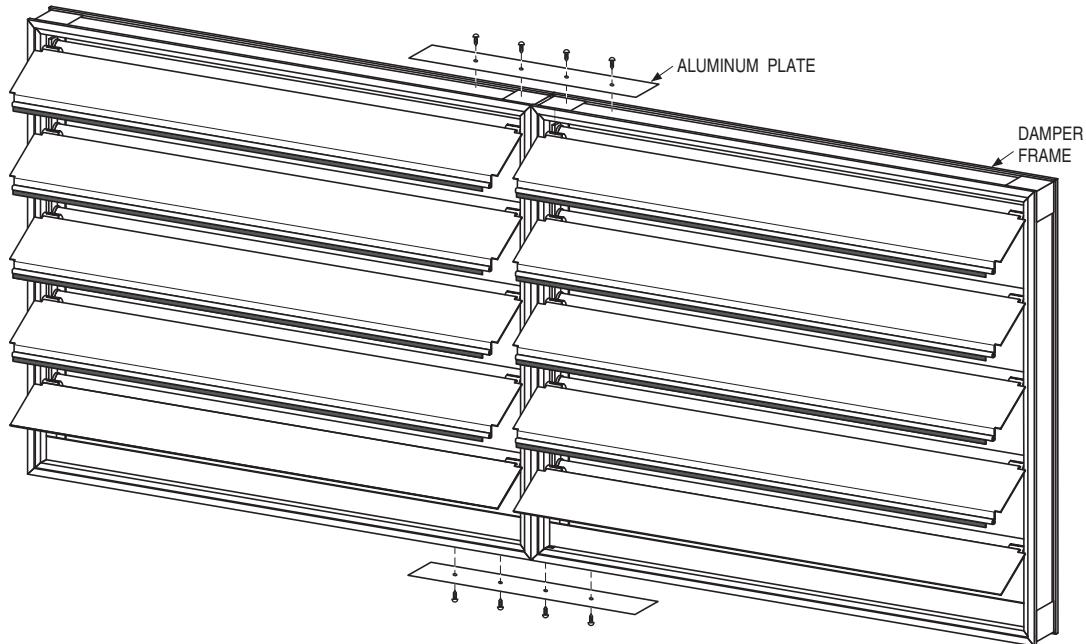


FIGURE 2:



IMPORTANT: BE SURE ALL FASTENERS (BY OTHERS) DO NOT INTERFERE WITH DAMPER LINKAGE AND BLADE OPERATION!

FIGURE 3:



COUNTERBALANCE ADJUSTMENT

Nailor counterbalanced backdraft dampers can be adjusted to open at a specific pressure. Before making adjustments, be sure that the damper is installed square and plumb and that the blades move freely. Damper should be fully closed under conditions of no airflow. Opening pressure can be adjusted by sliding counterbalance weights (further from blade to further assist opening). If full adjustment has been made and blades still don't open fully then more weight should be added. Repeat process if necessary to achieve final positioning.

MAINTENANCE

Dampers should be inspected at least once every two years, depending upon operating conditions, as part of a regular maintenance program. Wipe any dirt, dust etc. from blades and linkage. Lightly lubricate linkage and other moving parts with a dry type lube such as Moli-Spray Oil #3. Cycle damper by hand to ensure all blades and linkages move freely.

Dimensions are in inches (mm).

Page 2 of 2



Houston, Texas
Tel: 281-590-1172
Fax: 281-590-3086

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Fax: 702-638-0400

Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
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