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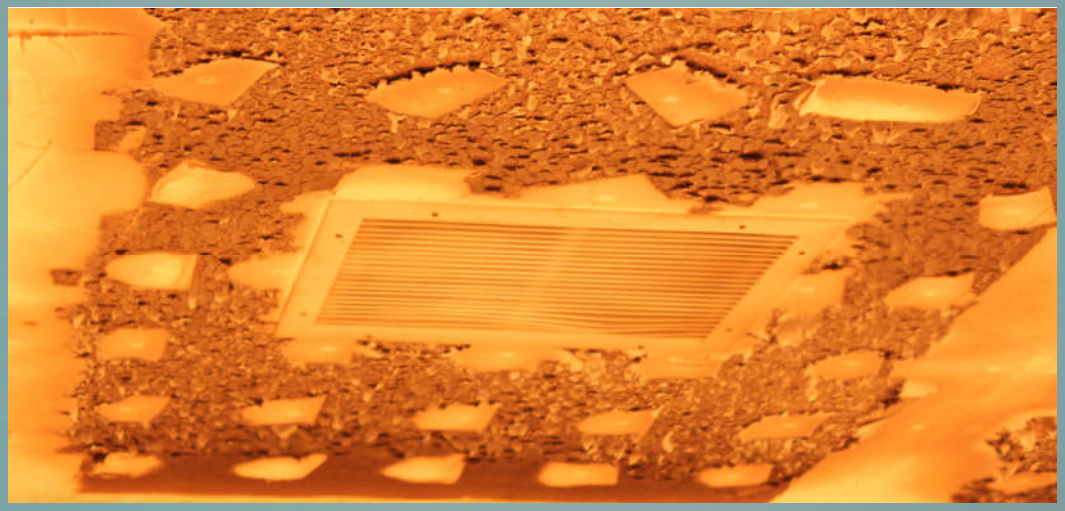
LIFE SAFETY PRODUCT APPLICATION

FIRE / SMOKE / CEILING RADIATION DAMPERS



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Applicable Products

- Curtain Fire Dampers
- Smoke Dampers
- Combination Fire/Smoke Dampers
- Ceiling 'Radiation' Dampers

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Standards & Governing Bodies:

- Underwriters Laboratories and ULC
  a) **UL 555** – Fire Damper Standard
  b) **UL 555S** – Smoke (Leakage) Damper Standard
  c) **UL 555C** – Ceiling (Radiation) Damper Standard
  d) **UL 263** – Structural Ceiling Test Standard
- National Fire Protection Association (NFPA) – NFPA 90A, 80, 92
- SMANCA – Break Away Duct Connections
- Air Movement & Control Association Intl. (AMCA) – AMCA 500D
- Others – Warnock-Hersey (Intertek), ETL, ARL, FM, Gypsum Assoc.

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Examples of Approved Breakaway Duct Connections

Plain "S" Slip

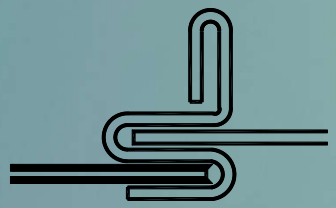
Hemmed "S" Slip

Double "S" Slip

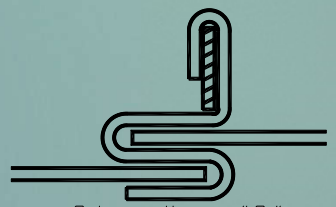
Inside Slip Joint

Flat Drive Slip

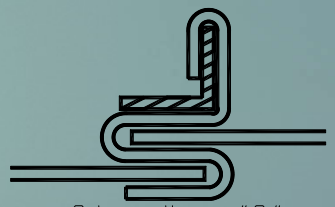
Drive Slip Joint



Standing "S"



Standing "S"
Bar Reinforced



Standing "S"
Angle Reinforced

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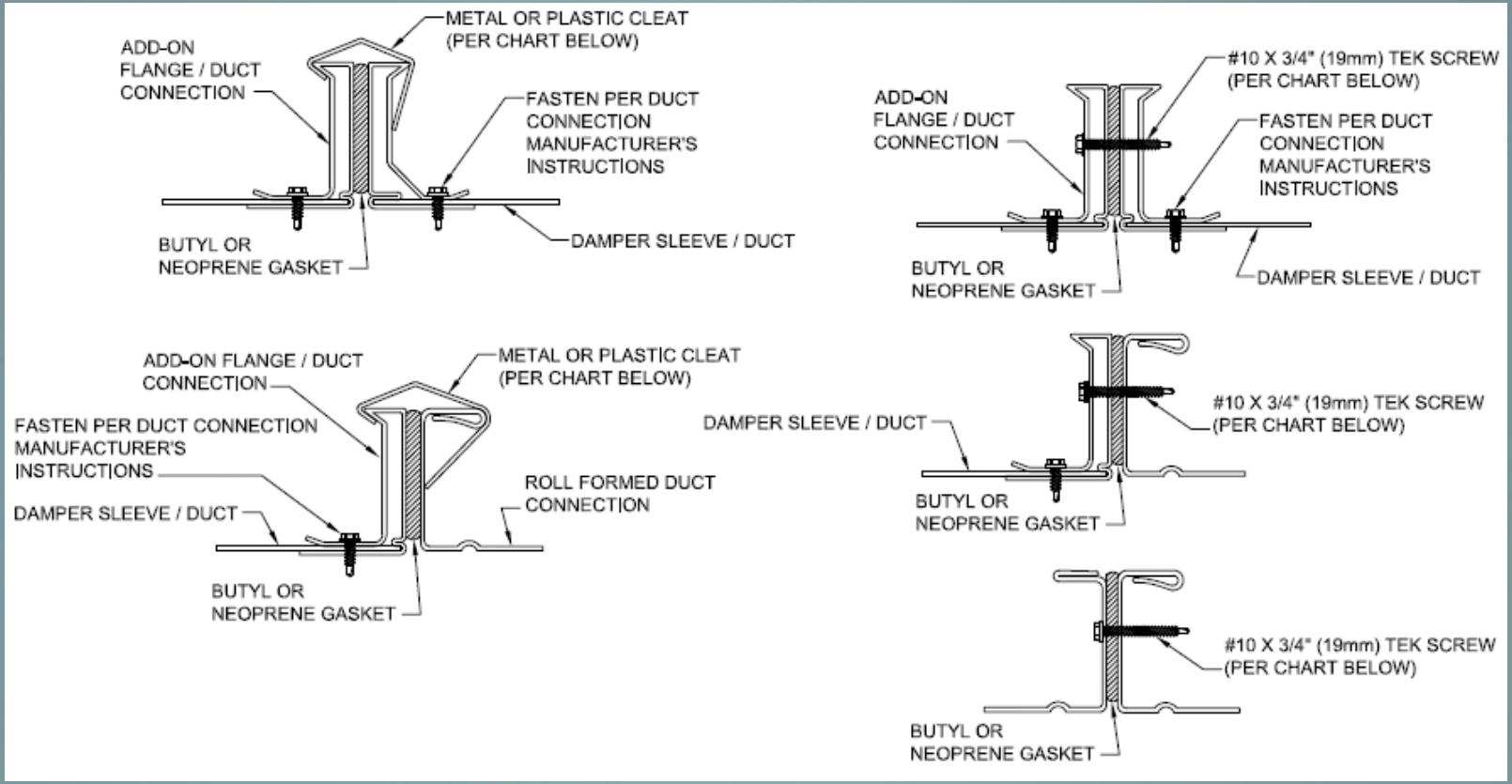
Dissimilar Duct Connections
(UL approved configurations vary by manufacturer)



Size	Cleats	Screws
w or h < 24"	1 per side (metal or plastic)	#10x3/4" (1 per side)
w or h 24" ≤ 36"	2 per side (metal or plastic)	#10x3/4" (2 per side)
w or h 36" ≤ 54"	3 per side (metal or plastic)	#10x3/4" (3 per side)
w or h 54" ≤ 72"	4 per side (metal or plastic)	#10x3/4" (4 per side)
w or h ≤ 72"	5 per side (metal or plastic)	#10x3/4" (5 per side)

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Curtain Fire Dampers

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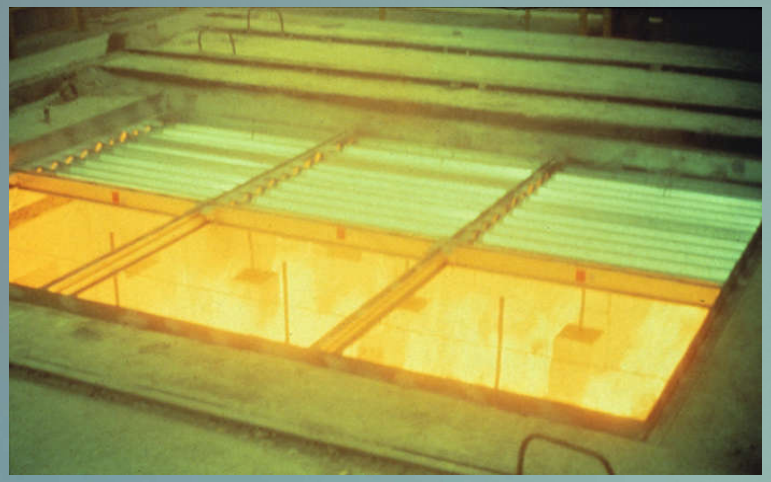
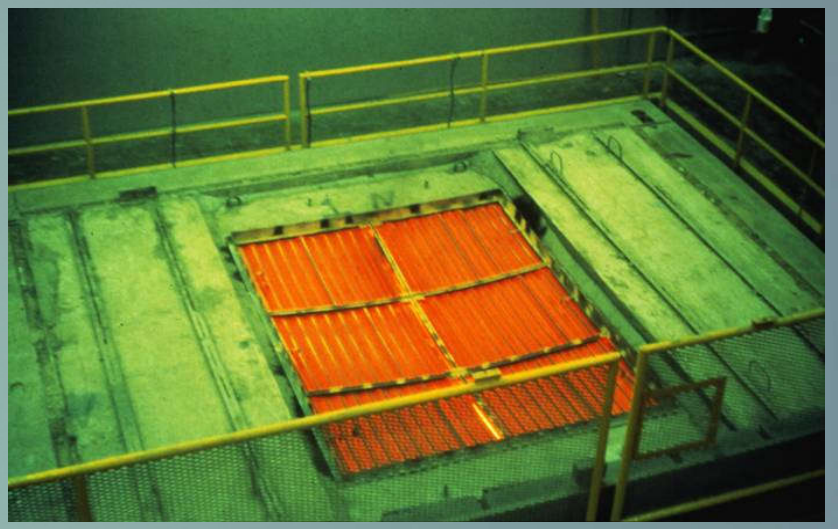
Horizontal Fire Test





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Typical Fire Damper Specifications:

- Hourly Fire Rated – 1½ or 3 Hours
- Static Systems – Airflow Stops in Fire Alarm Mode
- Dynamic Systems – Airflow Continues in Fire Alarm Mode
- Mounting Position – Horizontal or Vertical
- Transitions – Type A, B, CR, CO, C
- Installation – 'In Wall' or 'Out of Wall'

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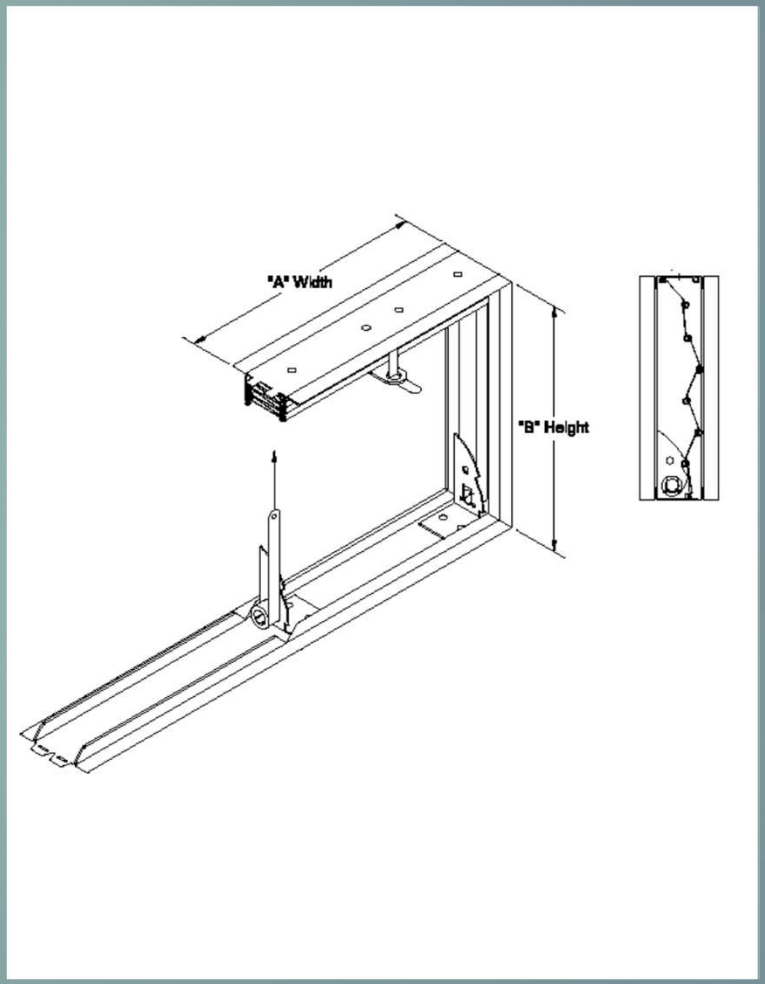
Basic Fire Damper Models:

- For Static Systems Only
- For Dynamic or Static Systems

Options:

- Horizontal and Vertical Mount
- Transition, A, B, CR, CO, C
- Out of Wall/Floor
- Grille Mount
- Multi-Blade, 3V or Airfoil
- True Round
- Fuse Link Temp., 165°F Min.



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Example of FD vs. FDD Rated Sizes

Fire Dampers for Use in Static Systems (No Airflow)

Model	Hr Class	Damper Mounting Position	Single Section Damper Size In.		Multiple Section Damper Size In.	
			W	H	W	H
FD, FD-SL	1-1/2	V	60	60	120	120
		H	48	48	96	48
		H	40	40	120	40

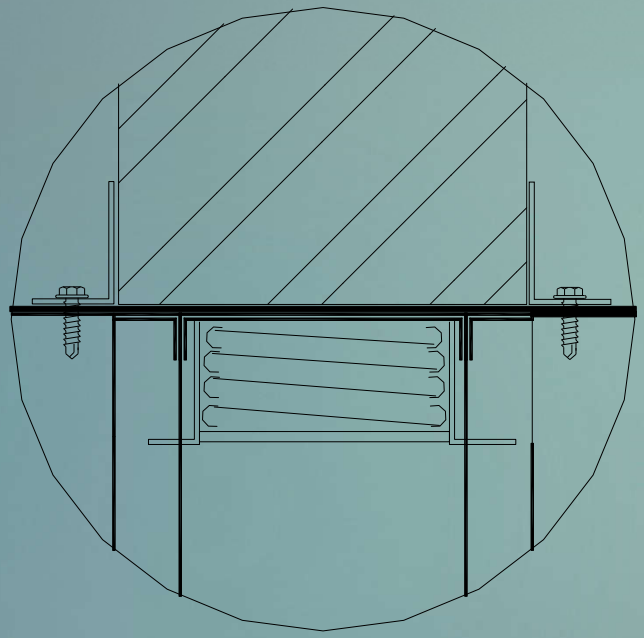
Fire Dampers for Use in Dynamic Systems

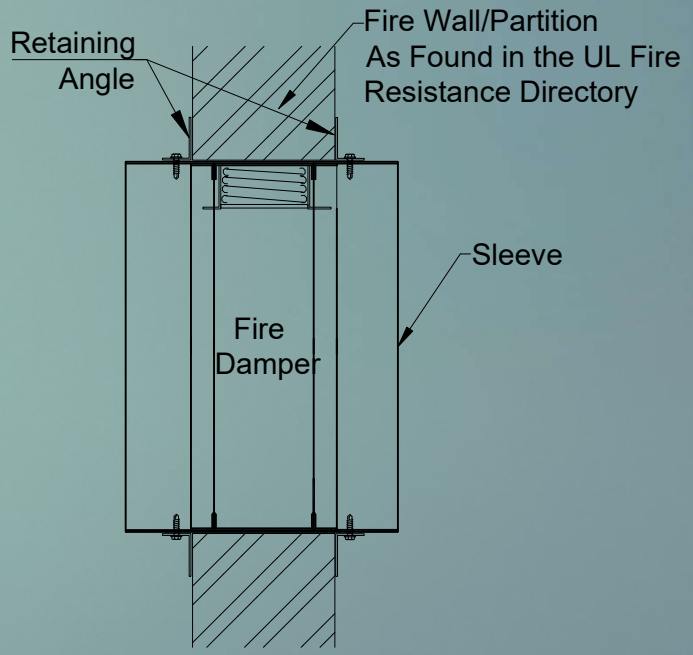
Dampers rated 2000 fpm / 4.0 in. WC:

Model	Hr Class	Damper Mounting Position	Single Section Damper Size In.		Multiple Section Damper Size In.	
			W	H	W	H
FDD, FDD-SL	1-1/2, 3	V	36	36	72	36
					36	72
		H	24	24	36	36

Basic (Typical) Fire Damper Installation:

(Angle on Each Side of the Wall)





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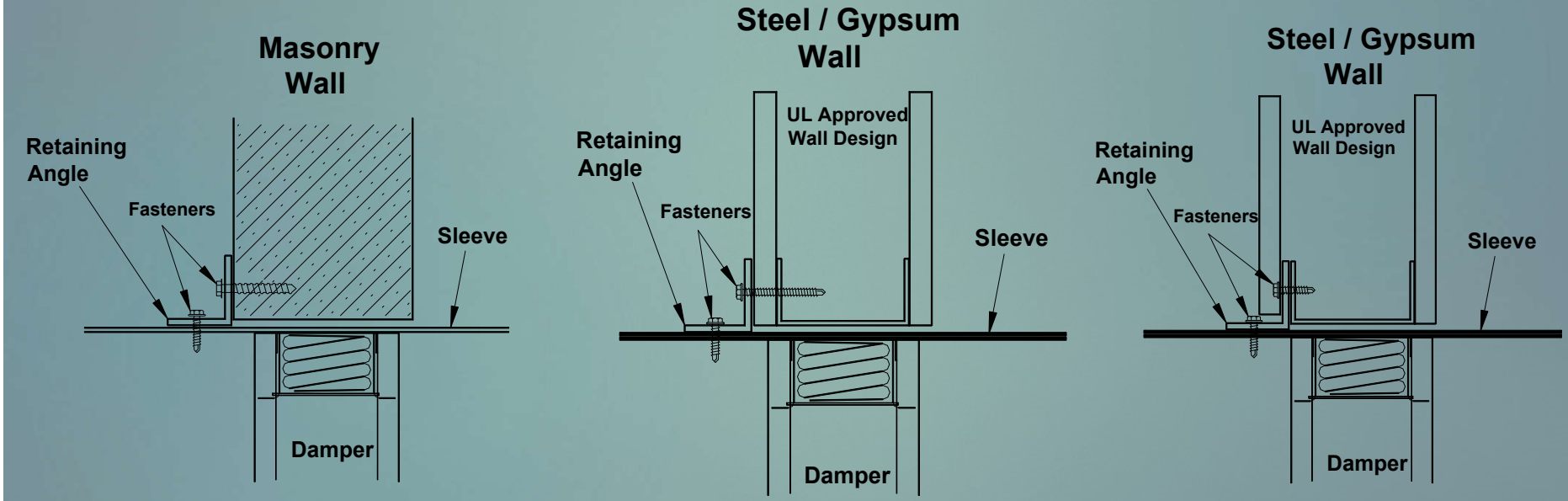
Other Installations:

‘In Wall’ One Retaining Angle Method



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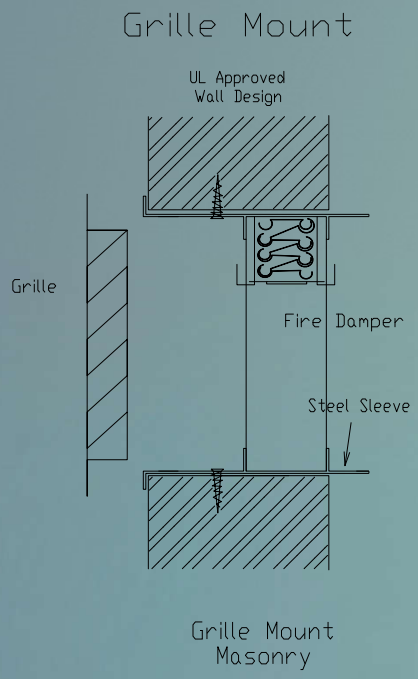
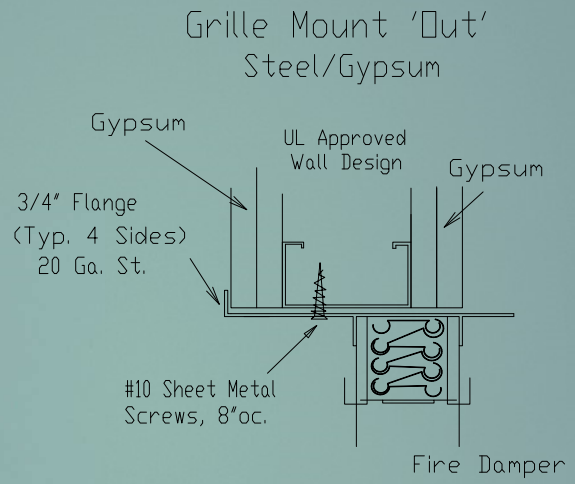
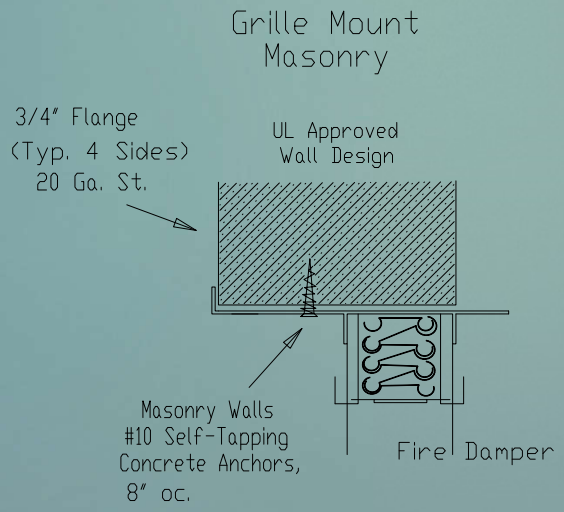
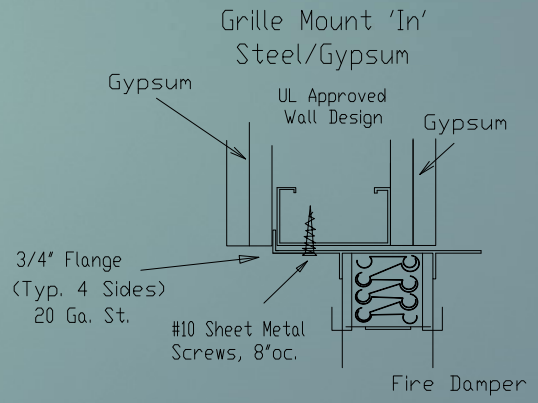
Other Installations (cont.):
'In Wall' No Retaining Angle Method









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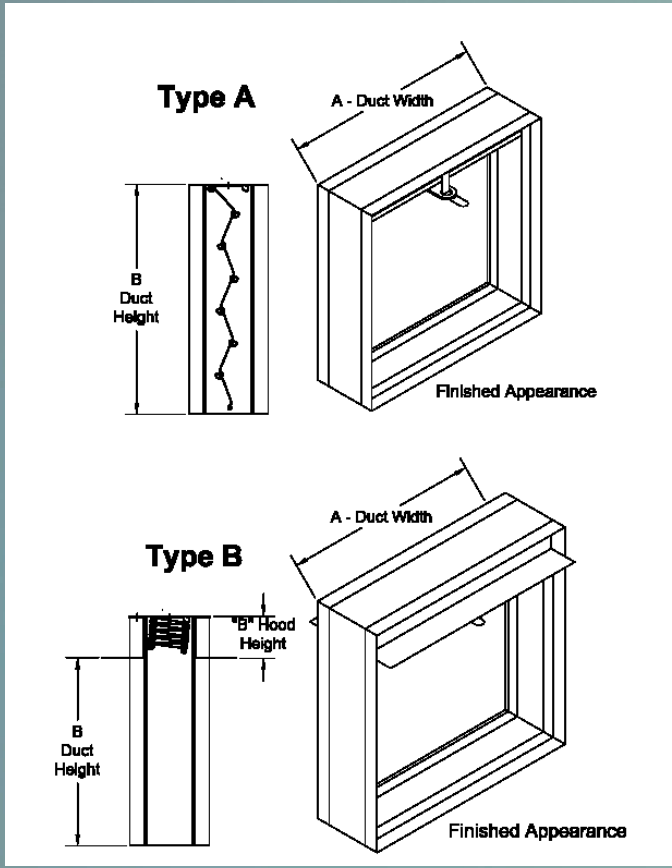
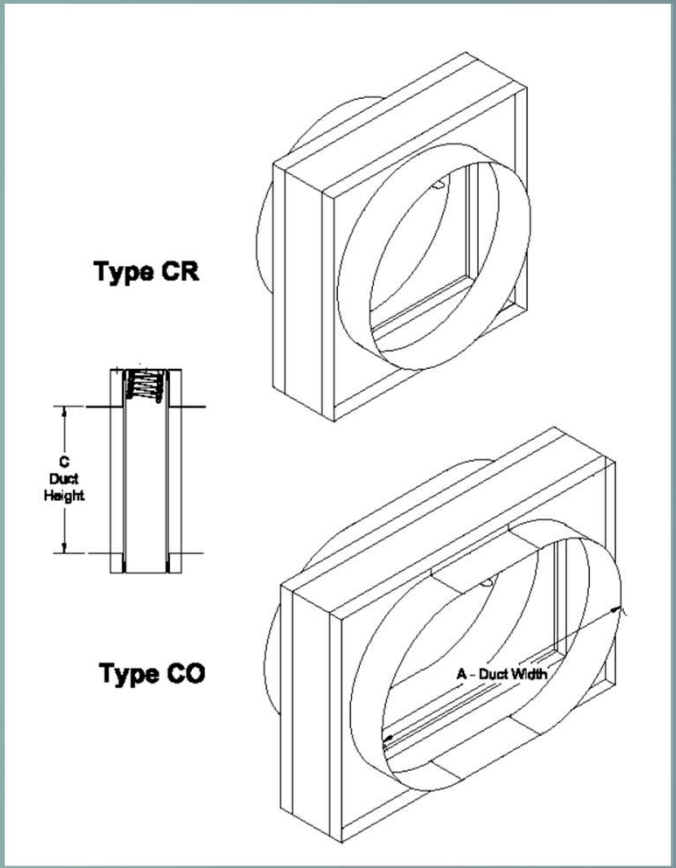
Basic Transitions:





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Smoke Dampers

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Typical Smoke Damper Specifications:

- Leakage Class – 1 or 2 (8 or 20 cfm/sq ft @4.5" wg)
- Airflow – 2000 fpm Duct Velocity minimum
- Static Pressure – 4" wg minimum
- Temperature – 250°F or 350°F
- Mounting Position – Horizontal or Vertical
- Transitions – Type A, B, CR, CO, C
- Installation – Up to 24" out of the Smoke Barrier

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Basic Smoke Damper Models:

3V Blade Design
Airfoil Blade Design
True Round Damper

Options:

- Blade Design: 3V, Airfoil, or True Round
- Transition: A, CR, CO, C, Sleeved or No Sleeved
- Leakage Class: 1 or 2
- Temperature Rated: 250°F or 350°F
- Internal or External Mounted Actuators
- Actuator Power Source: 24v, 120v, 230v, Pneumatic
- Blade Indicators, Open and Closed position

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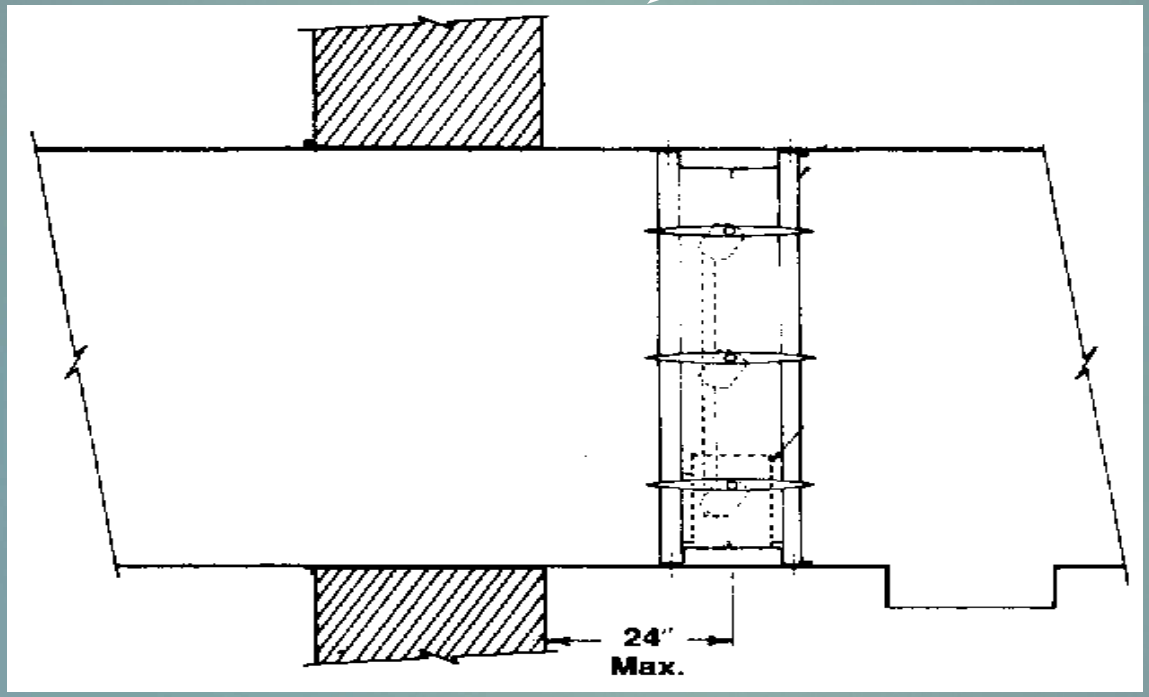
Smoke Damper Installation

No Openings Between Barrier and Damper



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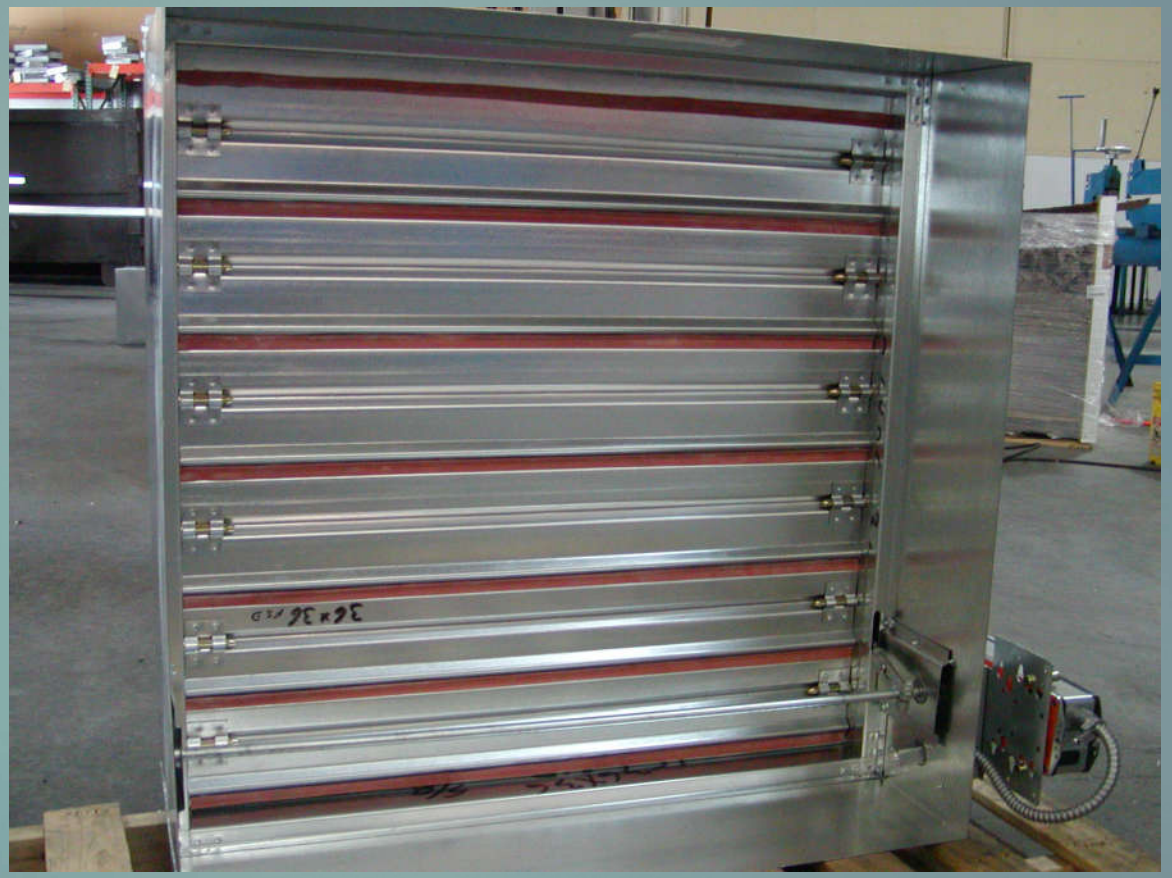
Combination Fire/Smoke Dampers



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1800 Degree F UL Fire Smoke Damper Test

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Blade Styles for Fire Smoke Dampers

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Typical Combination Fire/ Smoke Damper Specifications:

These Dampers have been tested as a Fire damper and as a Smoke Damper.

- Leakage Class – 1 or 2 (8 or 20 cfm/sq ft @4.5" wg)
- Airflow – 2000 fpm Duct Velocity minimum
- Static Pressure – 4" wg minimum
- Temperature (Damper) – 250°F or 350°F
- Temperature Response Device – Min. 160°F, Max. Damper
- Mounting Position – Horizontal or Vertical
- Transitions – Type A, B, CR, CO, C
- Installation – 'In Wall' or 'Out of Wall'
- Power Source for Actuator

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Basic Fire/Smoke Damper Models:

3V Blade Design

Airfoil Blade Design

True Round Damper

Modulating Damper (can be used as a control damper/fire,smoke damper)

Options/Features:

- Blade Design: 3V, Airfoil, or True Round
- Transition: A, CR, CO, C, Sleeved or No Sleeved
- Leakage Class: 1 or 2
- Temperature Rated: 250°F or 350°F
- Internal or External Mounted Actuators
- Actuator Power Source: 24v, 120v, 230v, Pneumatic
- Hourly Rating: 1½ or 3 hour
- Blade Indicators, Open and Closed position
- Canted Installation (True Round only)

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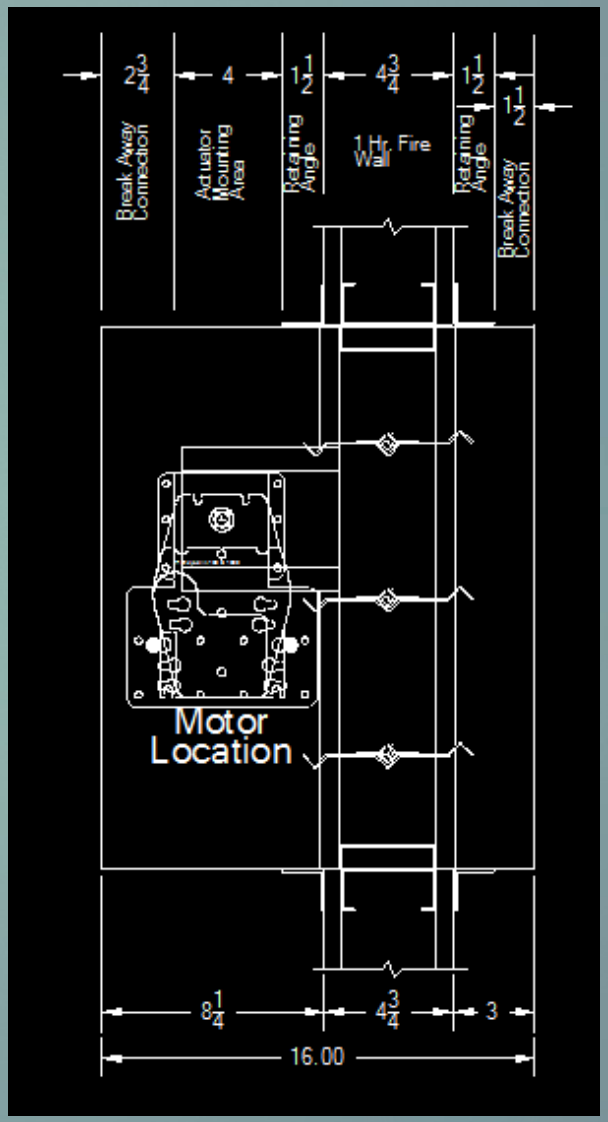
Typical Installation for in Floor Application

Typical Installation for in Wall Application



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Ceiling Radiation Dampers

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Ceiling Radiation Damper Specifications:

- Rated to be installed in Specific UL Approved Ceilings
- Round or Rectangular
- Currently Only Static Rated
- Mounting Position – Horizontal Only
- Blade Types – Butterfly or Fabric
- Installation – Usually within 3”- 4” of Ceiling
- Fuse Link – Usually 165°F or 212°F

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Basic Ceiling Damper Models:

Round Damper
Rectangular or Square Damper
Fabric Blade Damper, Rectangular

Options:

- Fuse Link: 212°F Standard, 165° Available
- Volume Control: Adjustable Feature to Vary Blade position from Below Damper
- Thermal Blanket: Provides Thermal Protection on Square Diffusers with Round Necks
- Wood/Gypsum Joist or Truss Ceilings: Special Dampers for these applications, 1 Hour Ceilings
- Hourly Rating: Ceiling Dampers are not Hourly Rated. They are rated as part of an Assembly. Most dampers are approved for 3 Hour and Less Ceilings
- Approved with a steel (or aluminum) Grille or Without a Grille
- Approved for Ducted and Non-Ducted Applications

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Typical Installations

Figure 1

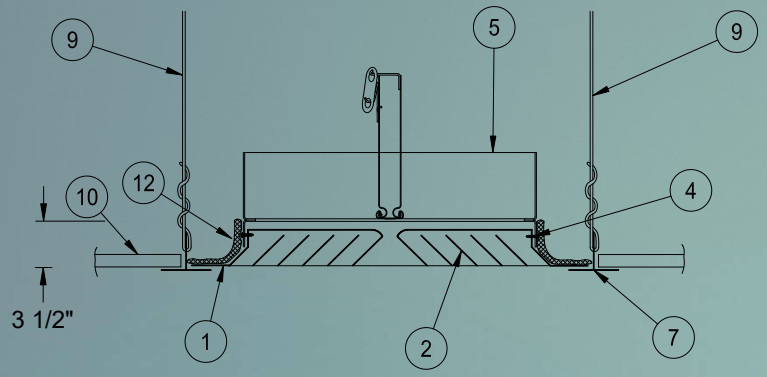


Figure 1A

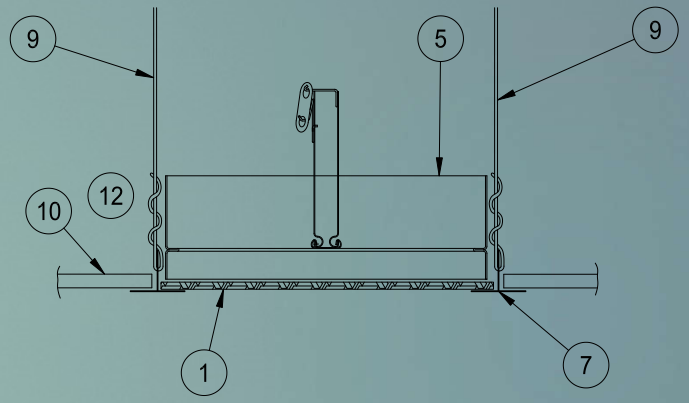


Figure 7

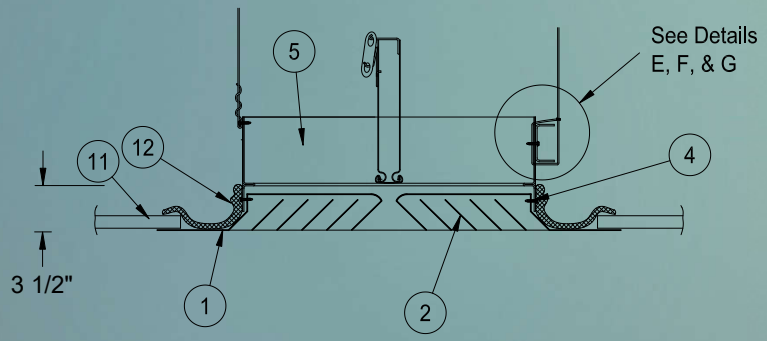
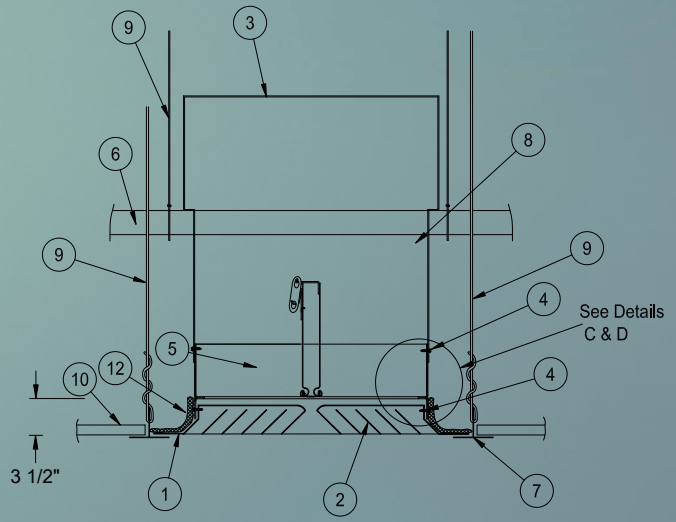


Figure 2



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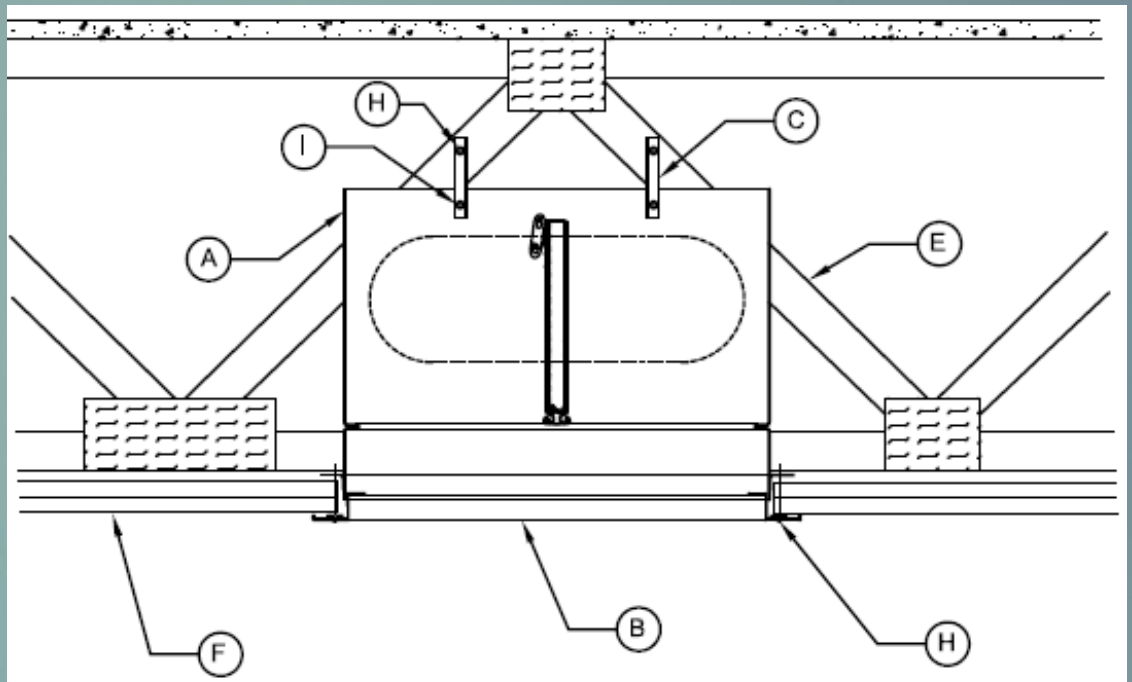
Installations into wood truss/wood joist assemblies



Intended for installation in Fire Resistance Design Nos. L546, L558, L574, L585, M520, P533, P538, P545, P547, & P559.

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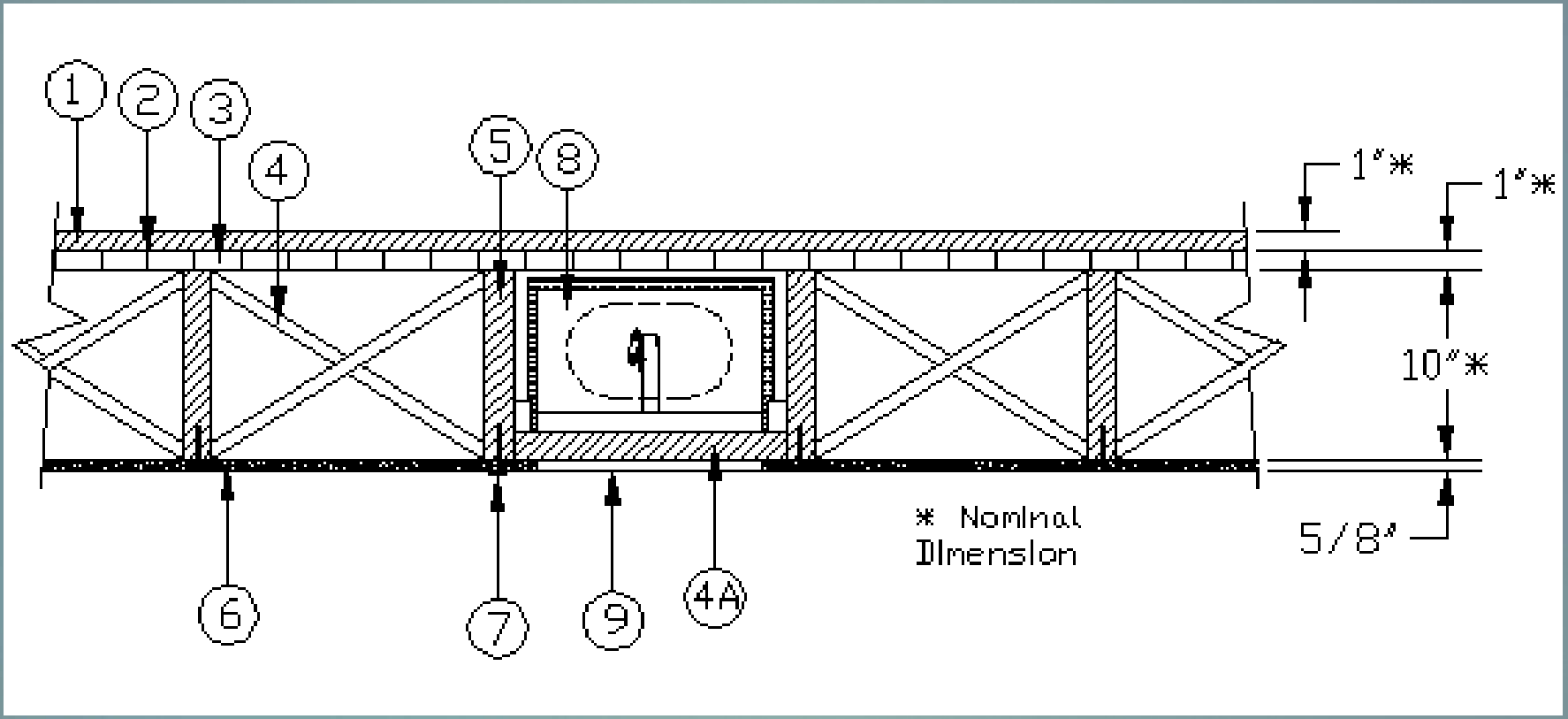
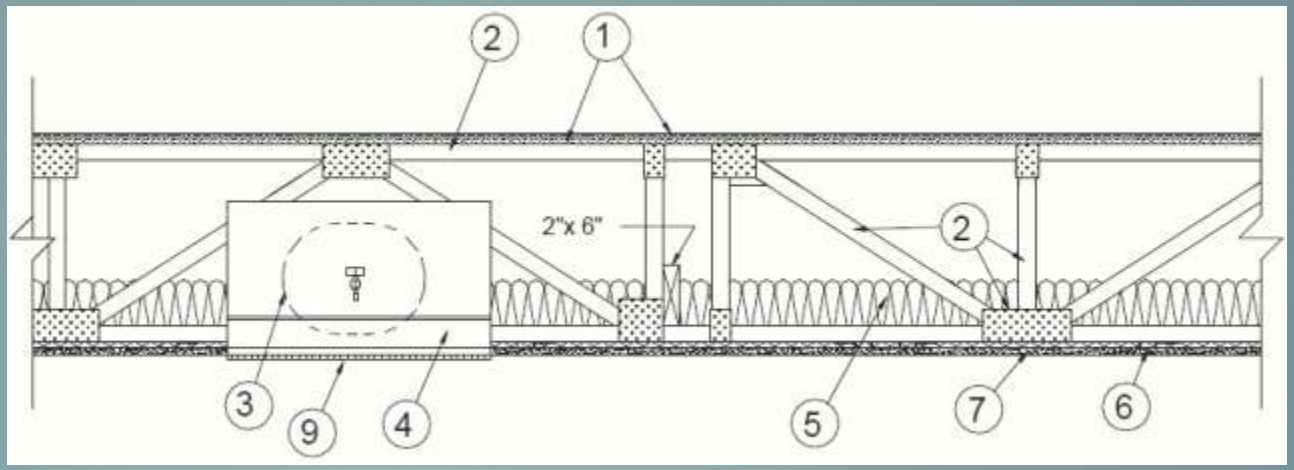
Wood Joist (UL Design 501)

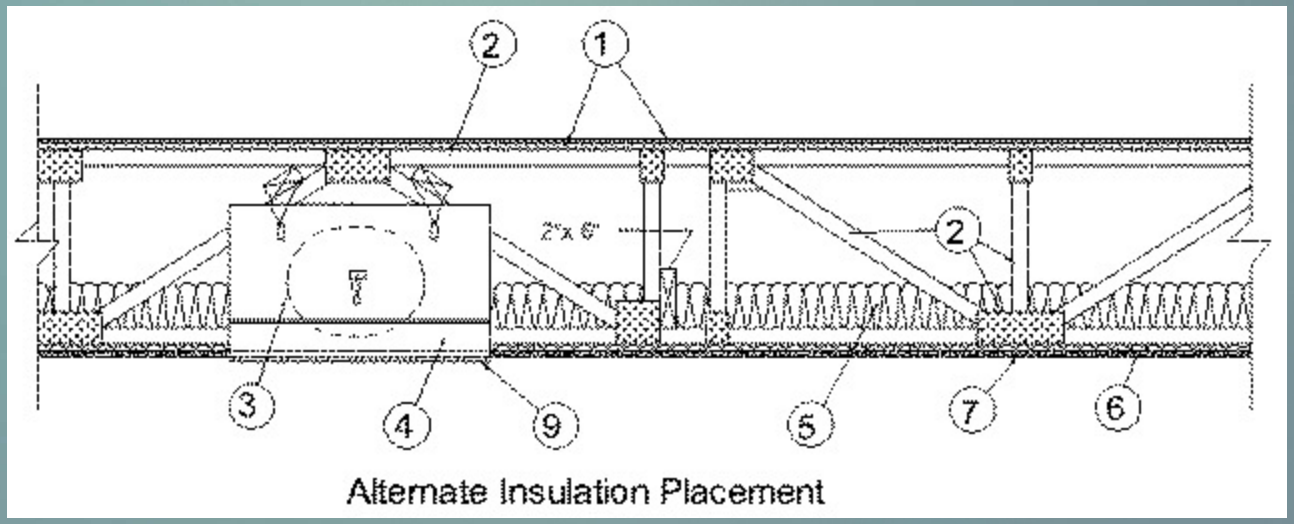


Research specified design numbers to make sure the damper is applicable.

Wood Truss (M520 shown)



(L521 shown)



Alternate Insulation Placement

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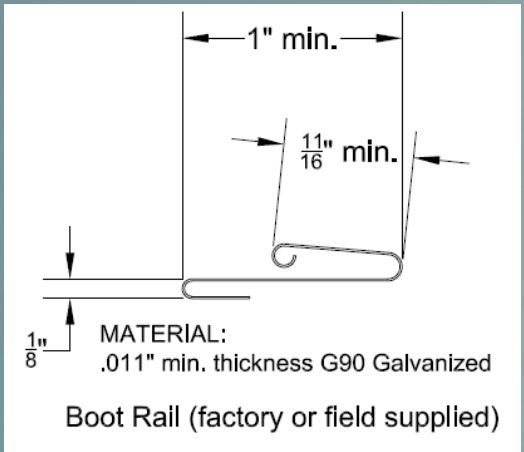
What is a boot rail?



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Questions?

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