

## INSTALLATION INSTRUCTIONS

### FSD60, FSD60-2, FSD60-V, FSD60XP, and FSD60M COMBINATION FIRE AND SMOKE DAMPERS

1 1/2 HOUR UL555 RATED      UL555S LEAKAGE CLASS 1 AND 2 RATED

#### APPLICATION

The FSD60 series combination fire and smoke dampers designed to restrict the passage of flame and resist the passage of smoke. The FSD60, 60-2, 60C, 60M, and 60XP are designed for installation with the blades running horizontally while the FSD60-V is designed for installation with the blades running vertically. The standard installation for all models is with the leading edge of the closed blades within the wall, partitions, or masonry floors with ratings of less than 3 hours. For out of the wall or grille access installations, refer to the GA and OW versions of the FSD60 and FSD60-2.

#### FSD60 and FSD60-2 MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE

- Single section vertical – 32"w x 48"h (813 x 1219).
- Single section horizontal – 30"w x 48"h (762 x 1219).
- Multiple sections vertical – 120"w x 96"h (3048 x 2438).
- Multiple sections horizontal – 144"w x 96"h (3658 x 2438).

#### FSD60M MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE

- Single section vertical – 32"w x 48"h (813 x 1219).
- Single section horizontal – 30"w x 48"h (762 x 1219).
- Multiple sections vertical – 120"w x 48"h (3048 x 1219).
- Multiple sections horizontal – 120"w x 48"h (3048 x 1219) or  
60"w x 96"h (1524 x 2438).

#### FSD60-V MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE

- Single section vertical – 48"w x 32"h (1219 x 813)

#### FSD60XP MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE

- Single section vertical – 32"w x 48"h (813 x 1219).
- Single section horizontal – 30"w x 48"h (762 x 1219).
- Multiple sections vertical – 64"w x 48"h (1626 x 1219).
- Multiple sections horizontal – 60"w x 48"h (1529 x 1219).

Dimensions shown in parentheses ( ) indicate millimeters.

#### INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:

- Optional Sealant of Dampers in Fire Rated Wall or Floor Openings
- Transfer Openings and Duct Terminations
- Optional FireStop Material
- Extension of Fire and Combination Fire and Smoke Damper Sleeves
- Fire and Combination Fire and Smoke Damper Installation in Concrete Floor with Steel Deck
- Drivemate No. 14880 Breakaway Connection
- Flanged System Breakaway Connections
- Cavity Shaft Wall Metal Stud Framing
- TS150 FireStat for "Reopenable" Combination Fire and Smoke Dampers
- SP100 Switch Package
- EFL Electric Resettable "Fuse" Link
- EFL/SP100 Electric Resettable "Fuse" Link
- PFL Pneumatic Fuse Link
- DSDF Flow Rated Duct Smoke Detector
- DSDN No-Flow Rated Duct Smoke Detector



SEE COMPLETE MARKING  
ON PRODUCT

California State Fire Marshal Listing No.

FSD60, 60-2, 60M, 60V and 60XP – 3235-0245-0126

NYC Department Of Building MEA 252-05-E

## 1. Opening Clearance

The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. For two angle installations the opening shall be a minimum of 1/8" per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 1/8" per foot (3 per 305) plus 2" (51), nor shall the opening be less than 1/4" (6) larger than the damper/sleeve assembly. For one angle installations, the opening shall be a minimum of 1/4" (6) to a maximum of 1" (25) larger than the overall size of the damper/sleeve assembly. The opening may be as much as 2" (51) larger than the damper/sleeve assembly if a 16ga (1.6) mounting angles is utilized.

## 2. Fasteners and Multiple Section Assembly

When joining multiple damper assemblies or fastening the damper to the sleeve, dampers shall be fastened with 1/4-20 (M6) bolts, number 10 (M5) screws, or 1/2" (13) long welds staggered intermittently on both sides. Space fasteners 6" (152) on center and a maximum 2" (51) from the ends of the joining sections or from each corner. When joining multiple damper assemblies, a continuous 1/8" (3) bead of Dow-Corning 700, silastic 732 RTV, or GE RTV 108 sealant shall be applied on the mullion joint. Press the surface of the sealant in place to dispel any air. Another bead of the same sealant shall be applied between the damper and sleeve in the same manner. Only one side of the damper requires caulking. Note the sealant is not required when dampers are supplied for fire damper applications only and are not required to be leakage rated. Multiple section high vertical mount dampers include a 14 gauge x 5" (2 x 127) wide steel mullion plate sandwiched between the damper frames where required. The mullion plate must be the same material as the dampers.

## 3. 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 NFPA90A. If a breakaway style duct/sleeve connection is not used, the sleeve shall be a minimum of 16 gauge (1.5) for dampers up to 36" (914) wide by 24" (610) high and 14 gauge (1.9) for dampers exceeding 36" (914) wide by 24" (610) high. Damper sleeve shall not extend more than 6" (152) beyond the fire wall or partition unless damper is equipped with an actuator and/or factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

## 4. Damper Orientation

Damper is designed to operate with blades running horizontally and must be installed with center line of damper frame within the wall or floor when they are in the closed position. Use "Mount With Arrow Up" label as a guide for proper damper orientation. Horizontal mount dampers may be installed with actuator above or below the floor.

## 5. Mounting Angles

Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gauge steel (38 x 38 x 1.0). For openings in metal stud and wood stud and concrete/masonry walls of sizes 90" x 49" or 49" x 90" (2286 x 1245 or 1245 x 2286) and less mounting angles are only required on one side of the wall or top of the floor and must be attached to both the sleeve and the wall. Mounting angles may be installed directly to the metal stud under the wall board on metal stud wall installations only. Larger openings and floor installations require mounting angles on both sides of the partition and must be attached only to the sleeve. Mounting angles must overlap the partition a minimum of 1" (25). Do not weld or fasten angles together at corners of dampers. Ruskin fire/smoke dampers may be installed using Ruskin FAST angle for one angle installation or Ruskin PFMA for two angle installations.

### a. Mounting Angle Fasteners

Sleeve: #10 bolts or screws, 3/16" (3) steel rivets or 1/2" (13) long welds.

Masonry Wall or Floor: #10 self-tapping concrete screws Wood/Steel Stud Wall: #10 screws.

### b. Mounting Angle Fastener Spacing

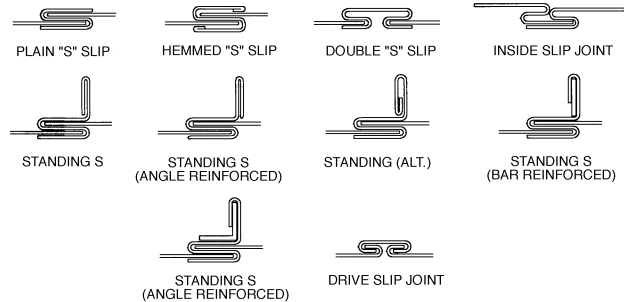
For one angle installations the sleeve fasteners shall be spaced at 6" (152) o.c. and the wall or floor fasteners shall be spaced at 12" (305) o.c. with a minimum of 2 fasteners on each side, top and bottom. Screw fasteners used in metal stud must engage

the metal stud a minimum of 1/2" (13). Screw fasteners used in wood stud must engage the wood stud a minimum of 3/4" (19). Screw fasteners used in masonry walls or floors must engage the wall or floor a minimum of 1 1/2" (38). For two angle installations the fasteners shall be spaced at 8" (203) o.c.

## 6. Duct/Sleeve Connections

### a. Break-away Duct/Sleeve Connections

Rectangular ducts must use one or more of the connections depicted below:



A maximum of two #10 (M5) sheet metal screws on each side and the bottom, located in the center of the slip pocket and penetrating both sides of the slip pocket may be used. Connections using these slip joints on the top and bottom with flat drive slips up to 20" (508) long on the sides may also be used.

### b. Round and Oval Break-away Connections

Round and flat oval break-away connections must use either a 4" (102) wide drawband or #10 (M5) sheet metal screws spaced equally around the circumference of the duct as follows:

- Duct diameters 22" (559) and smaller – maximum 3 screws.
- Duct diameters over 22" (559) and including 36" (914) – maximum 5 screws.
- Duct diameters over 36" (914) and up to and including 191" (4851) total perimeter – maximum 8 screws.

For flat oval ducts, the diameter is considered the largest (major) dimension of the duct. These connections are depicted in the SMACNA Fire, Smoke, and Radiation Damper Installation Guide.

**Note:** When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer's instructions:

Design Polymerics – DP 1010

Precision – PA2084T

Hardcast, Inc. – Iron Grip 601

Eco Duct Seal 44-52

### c. Flanged Break-away Style Duct/Sleeve Connections.

Flanged connection systems manufactured by Ductmate, Nexus or Ward are approved break-away when installed as shown on the Flanged Systems Breakaway Connections Supplement.

TDC and TDF roll-formed flanged connections using 3/8" (10) steel bolts and nuts, and metal cleats, as tested by SMACNA, are approved break-away connections when installed as shown on the Flanged Systems Breakaway Connections Supplement.

### d. Non-Break-away Duct/Sleeve Connections

If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers 36" (914) wide x 24" (610) high.

## 7. Actuator Connections

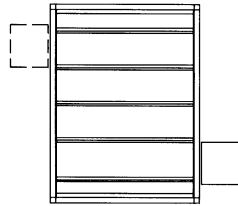
Electric and pneumatic actuators are to be connected in accordance with applicable codes, ordinances and regulations. Damper assemblies having more than one actuator must have all actuators wired to a single heat actuated device. This is required for simultaneous closure of all sections. Refer to the EFL, TS150, EFL/SP100 or PFL Operation Instructions Supplement for wiring and piping diagrams.

## 8. Installation and Maintenance

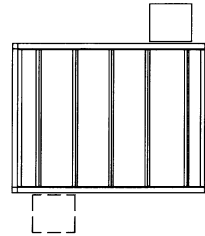
Each fire/smoke damper should be examined on a regular basis to ensure it is not rusted or blocked. In addition, each damper should be tested periodically, (NFPA recommends annually or semiannually, depending on the application) to ensure it will perform as intended. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

## ORIENTATION

**Motor Location**  
FSD60, FSD60-2, FSD60M,  
FSD60XP

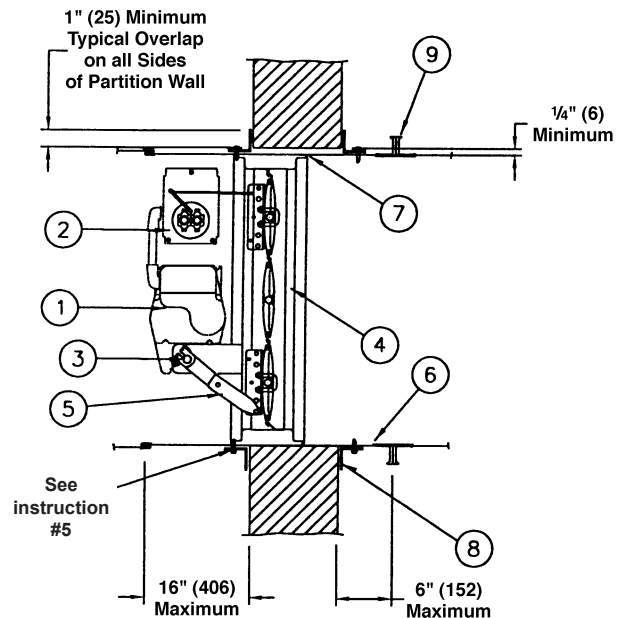
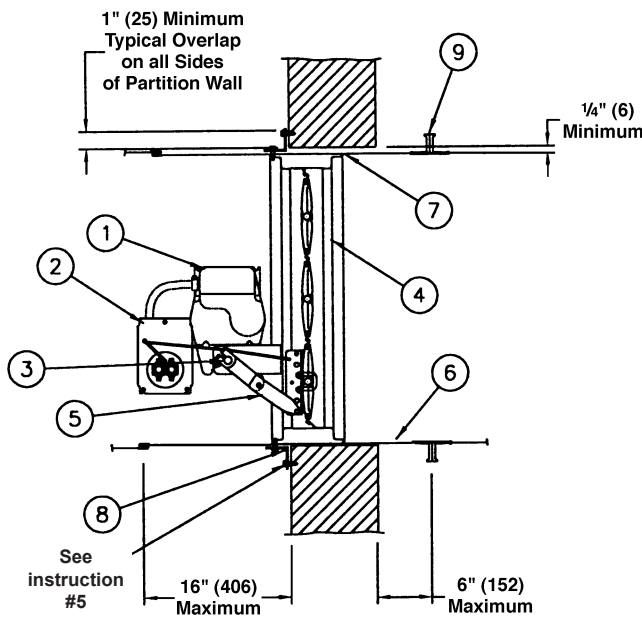


**Motor Location**  
FSD60-V



## VERTICAL INSTALLATION

Damper may be installed with actuator on either side of the partition in accordance with the mounting label on the damper.



**FAST ANGLE (ONE ANGLE) INSTALLATION**  
Angle may be installed on either side of the partition.

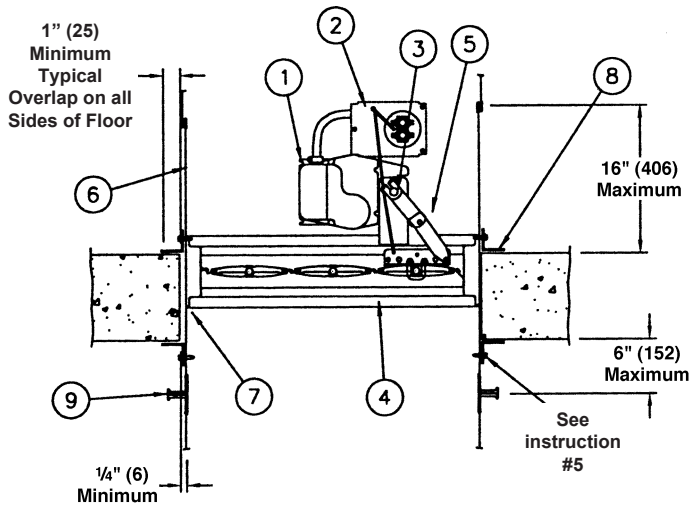
**TWO ANGLE INSTALLATION**  
Angles are required on both sides of the partition.

### ITEM DESCRIPTION

1. Actuator (location may vary).
2. Optional FireStat or SP100.
3. Auxiliary Operating Jackshaft
4. Damper
5. Over-Center Link
6. Sleeve
7. Caulking Material  
(may be on either side of damper frame).
8. Mounting Angles (PFMA, FAST or conventional angles)
9. Duct/sleeve connection.

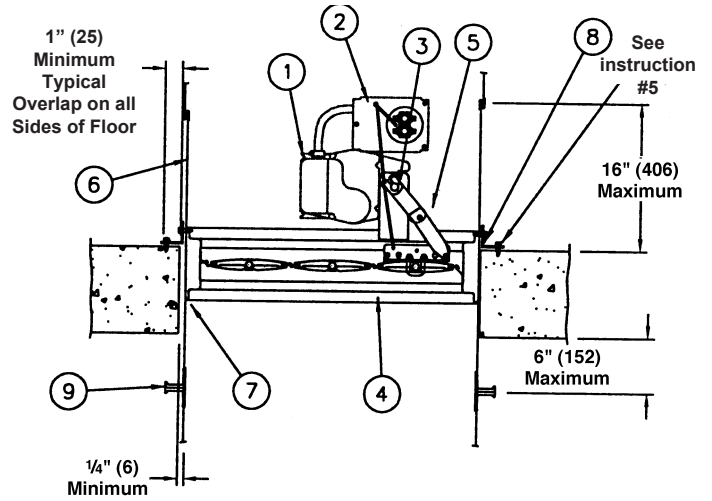
## HORIZONTAL INSTALLATION

Damper may be installed with actuator above or below floor in accordance with the mounting label on the damper.



### TWO ANGLE INSTALLATION

Angles are required on both sides of the floor.

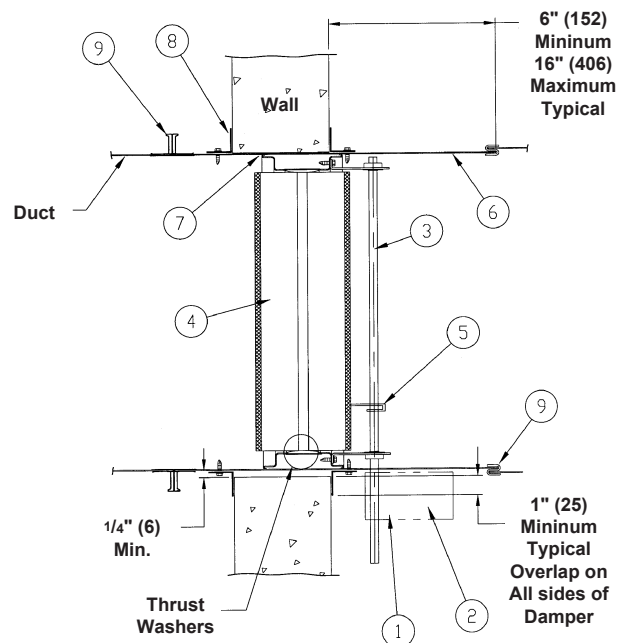


### FAST ANGLE (ONE ANGLE) INSTALLATION

Angle must be installed on top of floor.

ITEM	DESCRIPTION
1.	Actuator (location may vary).
2.	Optional FireStat or SP100.
3.	Auxiliary Operating Jackshaft
4.	Damper
5.	Over-Center Link
6.	Sleeve
7.	Caulking Material (may be on either side of damper frame).
8.	Mounting Angles (PFMA, FAST or conventional angles)
9.	Duct/sleeve connection.

## FSD60-V INSTALLATION (VERTICAL ONLY)



## RECOMMENDED FRAMING FOR OPENINGS IN WOOD AND METAL STUD WALLS

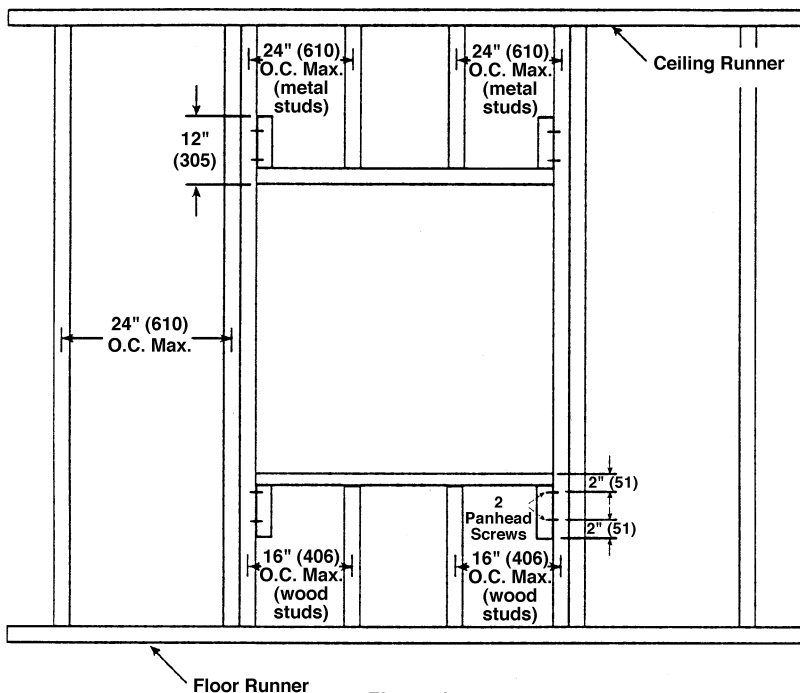


Figure 1

### INSTRUCTIONS

1. Frame wall openings as shown.
2. Double vertical studs are not required for openings 36" w x 36" h (914 x 914) or smaller.
3. All construction and fasteners must meet the requirements of the appropriate wall design and/or local codes.
4. Consult the authority having jurisdiction for other acceptable framing methods.

### NOTE:

The Metal Stud Construction and Wood Stud Construction figures at the bottom of the page depict mounting angles installed on both sides of the partition. A single angle may be sufficient. Refer to the instructions for single angle installation requirements.

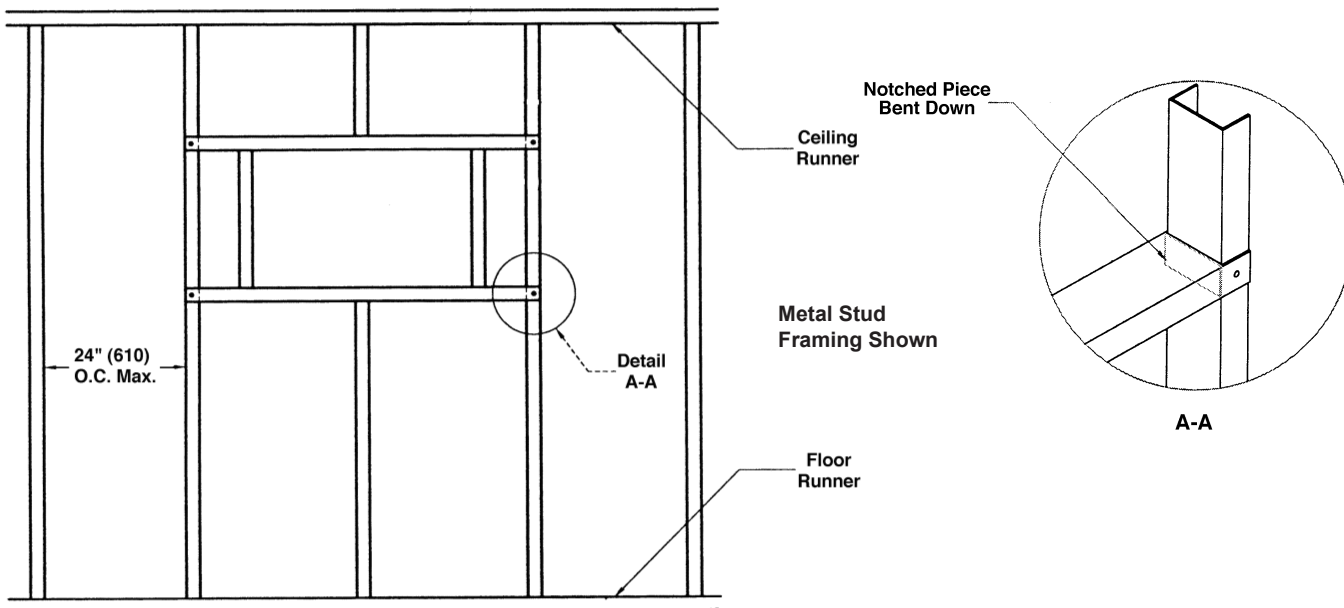
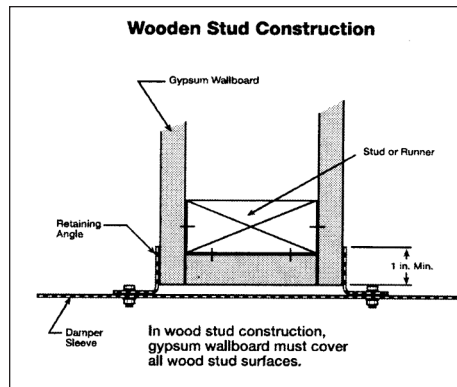
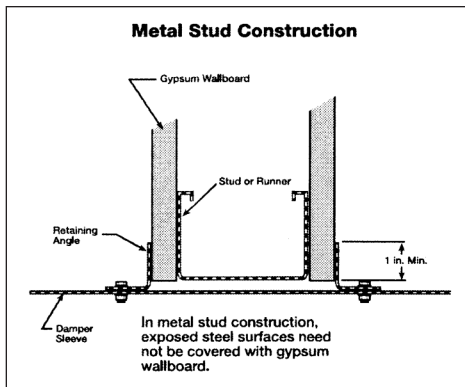
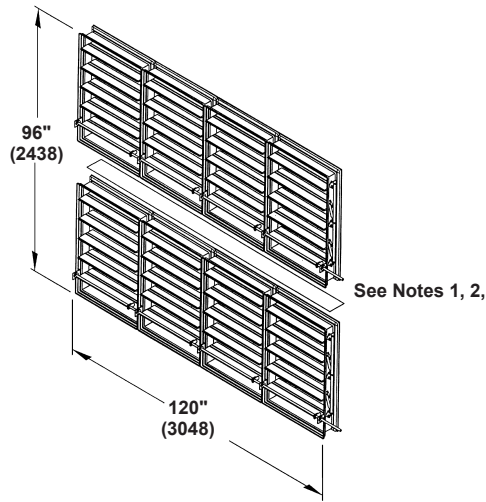


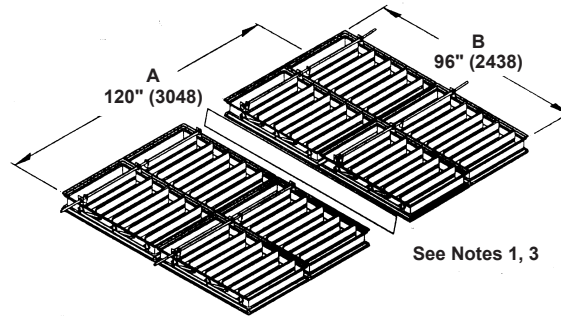
Figure 2



**MAXIMUM UL CLASSIFIED SIZE  
(Vertical Installation)  
FSD60**



**MAXIMUM UL CLASSIFIED SIZE  
(Horizontal Installation) FSD60**

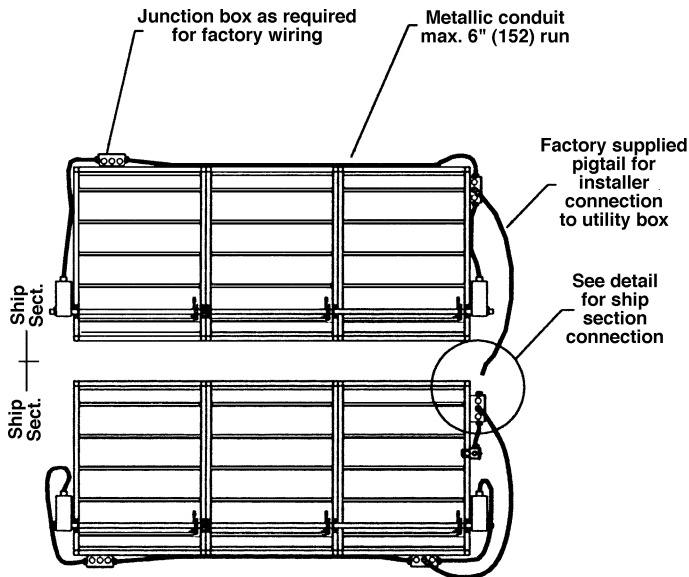


**Notes:**

1. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes shown on page one.
2. Two section high dampers require a 14 gauge reinforcing plate unless overall height is less than 91" (2311) and width is less than 32" (813). When using two individually sleeved units, the sleeve acts as the reinforcing plate, therefore no plate is required.
3. Horizontal dampers over 3 sections wide and 1 section high require a 14 gauge reinforcing plate. When using two individually sleeved units, the sleeve acts as the reinforcing plate, therefore no plate is required.

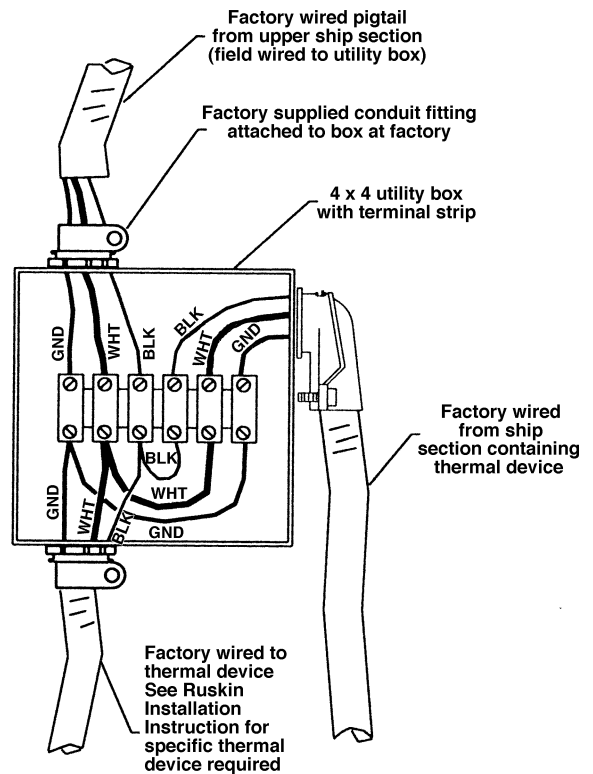
**MULTIPLE ACTUATOR DAMPER ASSEMBLIES**

Damper assemblies requiring more than one actuator must have all actuators wired to single heat actuated device (EFL or TS150) as shown below. This is required for simultaneous closure of all sections.



**TYPICAL SHIP SECTION DETAIL**

**Note:** All actuators must be wired to single thermal device.



**SHIP SECTION FIELD CONNECTION**

**Note:** Installer to run supply power to damper assembly thru thermal device.

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