

AVI-10 COMBINATION FIRE AND SMOKE DAMPERS

General Notes:

Combination Fire & Smoke Dampers are approved for use in static or dynamic systems and may be installed vertically or horizontally as long as the axes of the blades are horizontal. Series 10 dampers are UL rated for 1½ hours. Aire Technologies' combination fire & smoke dampers are bi-directional and may be installed with the jackshaft either upstream or downstream. For proper operation, all dampers must be installed square and free from racking. Dampers are to be arranged to operate automatically and are controlled by smoke detector, which is optional. Multi-section dampers should be wired in parallel to allow for actuators to operate simultaneously (page M-4). Damper must be cycled twice after installation is complete to verify operation.

Opening Preparation:

- The opening shall be enlarged by 1/8" per linear foot of both damper width and height to allow for thermal expansion (minimum 1/4"). Maximum opening size shall not exceed 1" larger than damper or sleeve assembly.

For installation steel stud/gypsum board partitions, see section on drywall partitions. (Page M-2)

Factory-Sleeve Duct Connection:

The installation of the damper and all duct connections to the damper sleeve shall conform to NFPA-90A and SMACNA Fire, Smoke and Radiation Damper Installation Guide. All duct connections shall also conform to UL 555. Connection ducts shall not be continuous but shall terminate at the damper sleeve. Duct connections to the sleeve will either be of breakaway or rigid types. Breakaway types are listed on page M-3.

The following determines if the connections are to be rigid or breakaway. For rigid type duct connection, sleeve shall be a minimum of 16 gauge on dampers not exceeding 36" wide or 24" high or 24" diameter and sleeve shall be a minimum 14 gauge on larger units. Dampers supplied with thinner sleeves shall be a breakaway connection of the following type: plain "S" slip, double "S" slip. Ductmate-type connections as shown on page M-3 and all connections not listed as breakaway shall be considered rigid. Breakaway joints types are shown on page M-3. Sleeves shall not extend more than 6" beyond the partition and 16" on opposite side for actuator mounting and/or access doors. Sleeve may extend up to 16" on both side of partition if actuator is installed on one side and access door on opposite side.

Single-Section Maximums:

- Model 10V - 3V Crimped Blades:
 Vertical Max: 36"W x 48"H
 Horizontal Max: 36"W x 36"H
 Model 10F - Airfoil Blades:
 Vertical Max: 36"W x 48"H
 Horizontal Max: 36"W x 36"H

Multi-Section Maximums:

- Model 10V - 3V Crimped Blades:
 Vertical Crimped Blades: 144"W x 48"H
 Horizontal Crimped Blades: 72"W x 36"H
 Model 10F - Airfoil Blades:
 Vertical Airfoil Blades: 108"W x 48"H

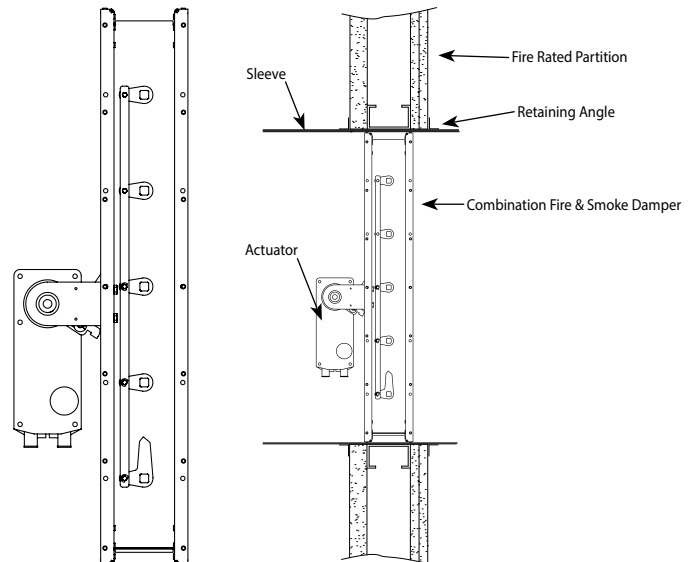
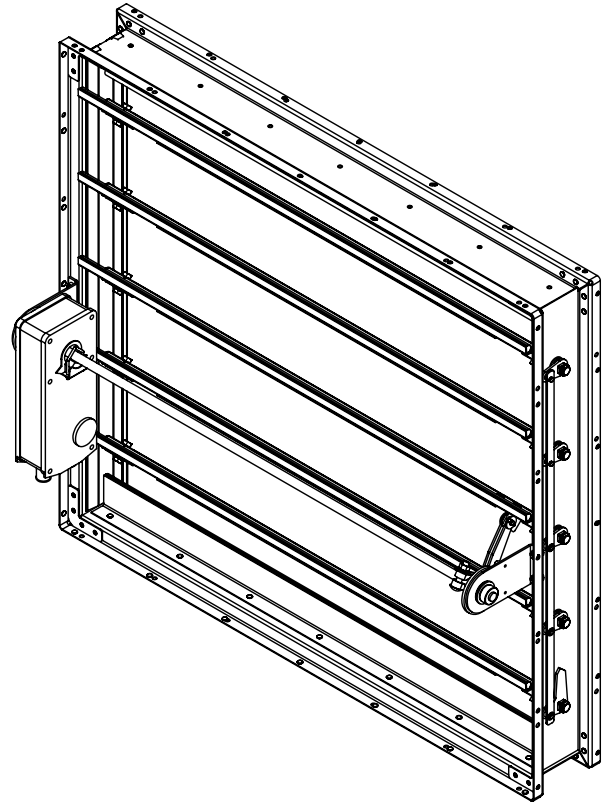
See section on Breakaway Connections (Page M-3)

See section on Retaining Angles (Page M-4)

See section on Sleeves (Page M-4)

See section on Multi-Section Dampers (Page M-4)

See section on Actuator Wiring (Page M-5)



UNDERWRITERS' LABORATORIES (ULS55C)
 CLASSIFIED CEIUNG RADIATION DAWPERS
 FIRE RESISTENCE RATED 3 HOURS.
 FOR USE IN UL CLASSIF'IED BUILDING
 WATERIALS RATED 3 HOURS OR LESS.

ALL INSTALLATIONS ARE SUBJECT TO LOCAL AUTHORITY APPROVAL PRIOR TO ORDERING DAMPERS AND DAMPER INSTALLATION

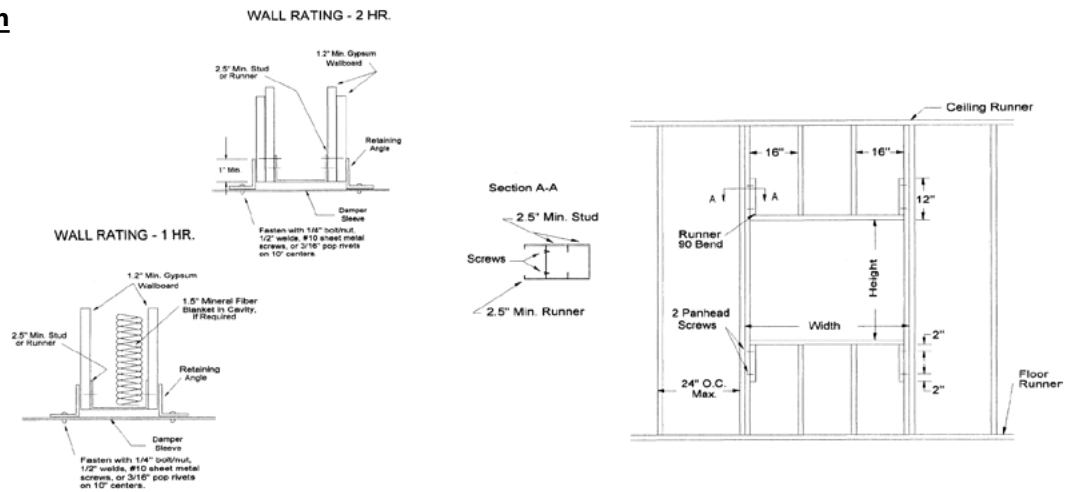
FOR FIRE DAMPERS INSTALLED INTO METAL OR WOOD FRAMED FIRE BARRIERS WITH RATINGS OF LESS THAN 3 HOURS

Supplemental Installation - Metal Stud Framing for Fire/Smoke Dampers in Drywall Partitions:

These supplemental installation instructions are for curtain, out-of-wall, or multi-blade dampers. Refer to the installation instructions provided in these pages for details concerning sleeve thickness, sleeve length, duct connections, multi-section assembly, and opening tolerances. Filler pieces are optional in metal stud framing (consult local code to see if filler pieces are required). Filler pieces are to be double screwed (or nailed to wooden studs) on 12" maximum centers to the web of runners and studs.

Details of Opening Preparation and Fire Damper Installation:

Note: Gypsum panels screwed to all stud and runner flanges, 12" OC, maximum surrounding opening.

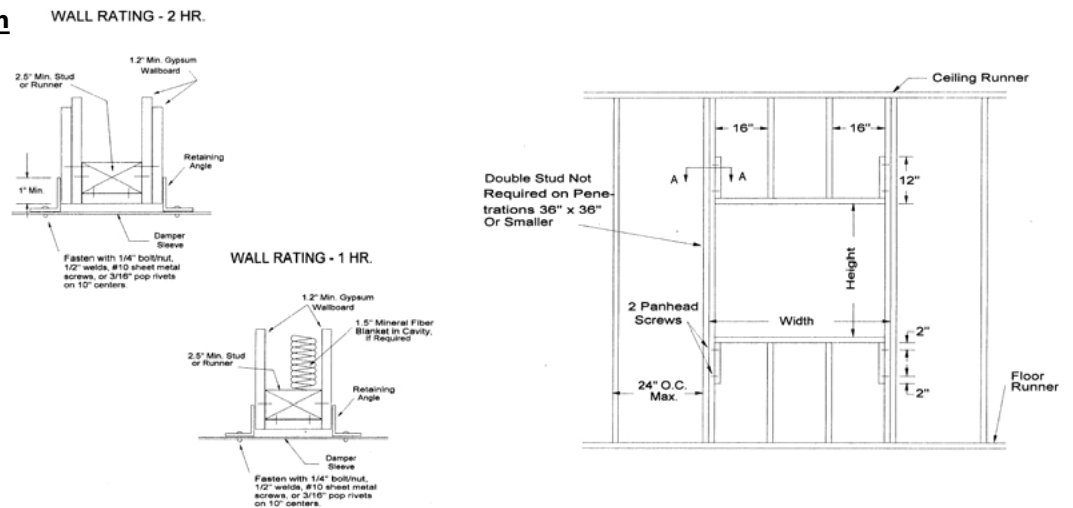


Supplemental Installation - Wood Stud Framing for Fire/Smoke Dampers in Drywall Partitions:

These supplemental installation instructions are for curtain or multi-blade dampers. Refer to the installation instructions provided on the previous pages for details concerning sleeve thickness, sleeve length, duct connections, multi-section assembly, and opening tolerances. When wooden studs are used, filler pieces shall be installed around entire opening. Filler pieces are to be double screwed or nailed to wooden studs on 12" max centers to the web of runners and studs.

Details of Opening Preparation and Fire Damper Installation:

Note: Gypsum panels screwed to all stud and runner flanges, 12" OC, maximum surrounding opening.



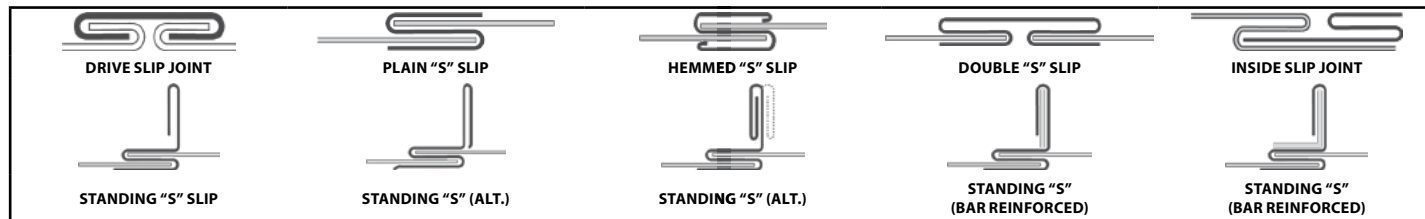
UNDERWRITERS 'LABORATORIES (ULS55C) CLASSIFIED CEIUNG RADIATION DAWPERS FIRE RESISTENCE RATED 3 HOURS. FOR USE IN UL CLASSIF'IED BUILDING WATERIALS RATED 3 HOURS OR LESS.

BREAKAWAY CONNECTIONS

Breakaway connections shall have no more than 2 No. 10 (4.8mm) diameter sheet metal screws on each side and on the top and bottom located in the center of the slip pocket and shall penetrate both sides of the slip pocket. Breakaway joints of the type shown on page M-3 are permitted on the top and bottom of horizontal ducts (vertical dampers) with flat slips not exceeding 20 inches (508mm) in length on the sides.

Breakaway Style Transverse Joints:

- Transverse joints illustrated at right have always been approved as breakaway connections. SMACNA testing has also approved the following variations as breakaway connections (see below).
- Standing "S" joints can be applied with No. 10 sheet metal screws (through joint and duct) subject to the following limitations: maximum 2 screws in each side and in bottom joint.
- Transverse joints illustrated can be applied as top and bottom joints with drive slip – side joints in duct heights up to 20 inches.



Round and Oval Duct Breakaway:

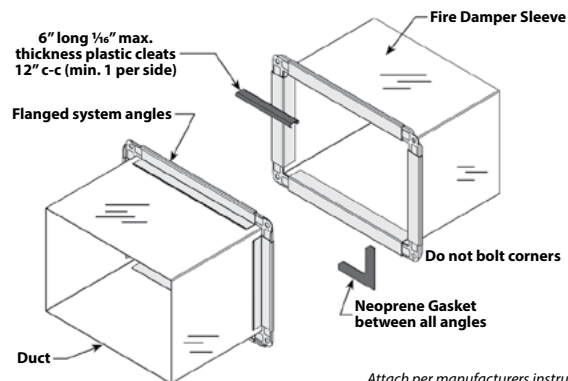
Round or flat oval ducts connected to type R, C, or O damper collars may use No. 10 sheet metal screws as follows:

- Ducts to 22" wide (or dia.) and smaller may use 3 screws
- Ducts larger than 22" wide (or dia.) may use 5 screws

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

Manufactured Flange System Breakaway Connections:

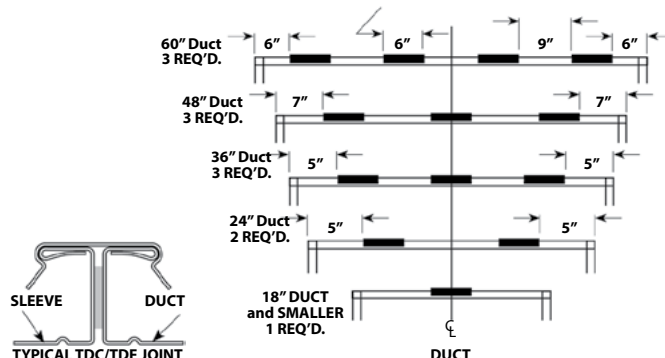
Flanged connection systems manufactured by Ductmate, Ward, and Nexus are approved as breakaway connections when installed as illustrated.



Proprietary Flange System Breakaway Connections:

(TDC by Lockformer, TDF by Engle)

TDC and TDF systems are approved as breakaway connections when installed as described in the TDC or TDF addendum to the SMACNA Duct Construction Standards except the corners may not be bolted. Standard 5" metal clips may be used with spacing as shown in diagram.



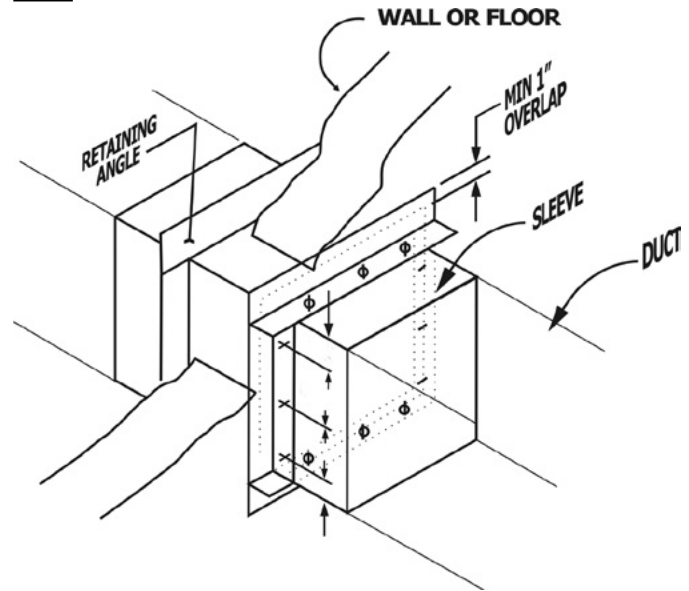
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SECURING FIRE/SMOKE DAMPER AND SLEEVES TO WALL AND FLOOR OPENING

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

- Retaining angles shall be a minimum of 16 gauge steel and have a minimum 1½" x 1½" legs.
- The angles shall be attached to all 4 sides of the sleeve with butt joints at each corner. Fasteners (No. 10 bolts or screws, 3/16" steel rivets or ½" tack welds) are required on each side, top, and bottom and shall be spaced 6" center-to-center staggered intermittently on both sides of the damper. The angles need not be attached to each other at the corners.
- Retaining angles shall completely cover the clearance space between the sleeve and the wall/floor opening, plus overlap the wall/floor a minimum of 1". This coverage includes all corners (fig. 2).
- Retaining angles should not be fastened to the wall/floor material. The angles should only sandwich the wall/floor and allow for damper/sleeve expansion during periods of intense heat.
- For grille installation, angle legs may be reversed and one leg inserted into the wall/floor opening, provided the required clearance is maintained between angle leg fasteners and the wall opening.

fig. 2



Multi-Section Damper Assembly:

Multi-section dampers are only installed in the vertical position only. When joining single section tall dampers, the sections are to be fastened together using 1/4" – 20 bolts or No. 10 screws spaced 8" center-to-center. The fasteners shall be staggered intermittently on both sides, reversing direction on every other fastener. Attach the damper to the sleeve with 1/4" – 20 bolts, No. 10 screws, or 1/2" welds spaced 6" center-to-center, staggered intermittently on both sides.

Dampers two sections tall require a 14 gauge reinforcing plate unless they are less than 36" wide. The dampers are to be bolted together using 1/4" – 20 bolts spaced 12" center-to-center, staggered intermittently on both sides through the 14 gauge plate and both dampers. When using 2 individually sleeved units, the sleeve acts as the reinforcing plate and no additional plate is required.

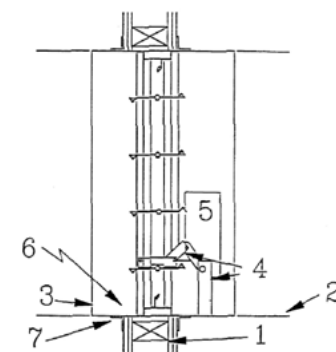
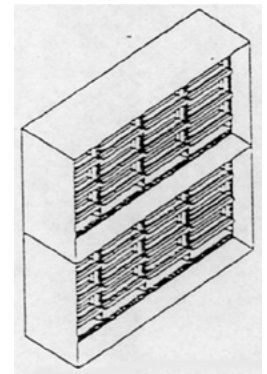
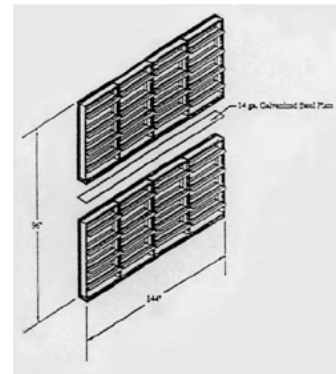
When joining multiple damper assemblies, a continuous 1/8" bead of Dow-Corning® 100% silicone rubber, Dow-Corning® Silastic 732, or GE RTV 108 sealant shall be applied on the mullion joint. Press the surface of the sealant in place to dispel any air. Another bead of the same sealant shall be applied between the damper and the sleeve in the same manner. Only one side of the damper requires caulk/sealant. Note the sealant is not required when dampers are supplied for fire applications only and are not required to be leakage rated.

Access:

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

Maintenance:

Dampers shall be maintained in intervals as stated in NFPA 90A, Appendix B, unless local codes require more frequent inspections. Check the fuse link, stainless steel closure springs where furnished, cycle damper, check for free operation and complete closure, clean with mild detergent or solvent, and secure damper open with fusible link.

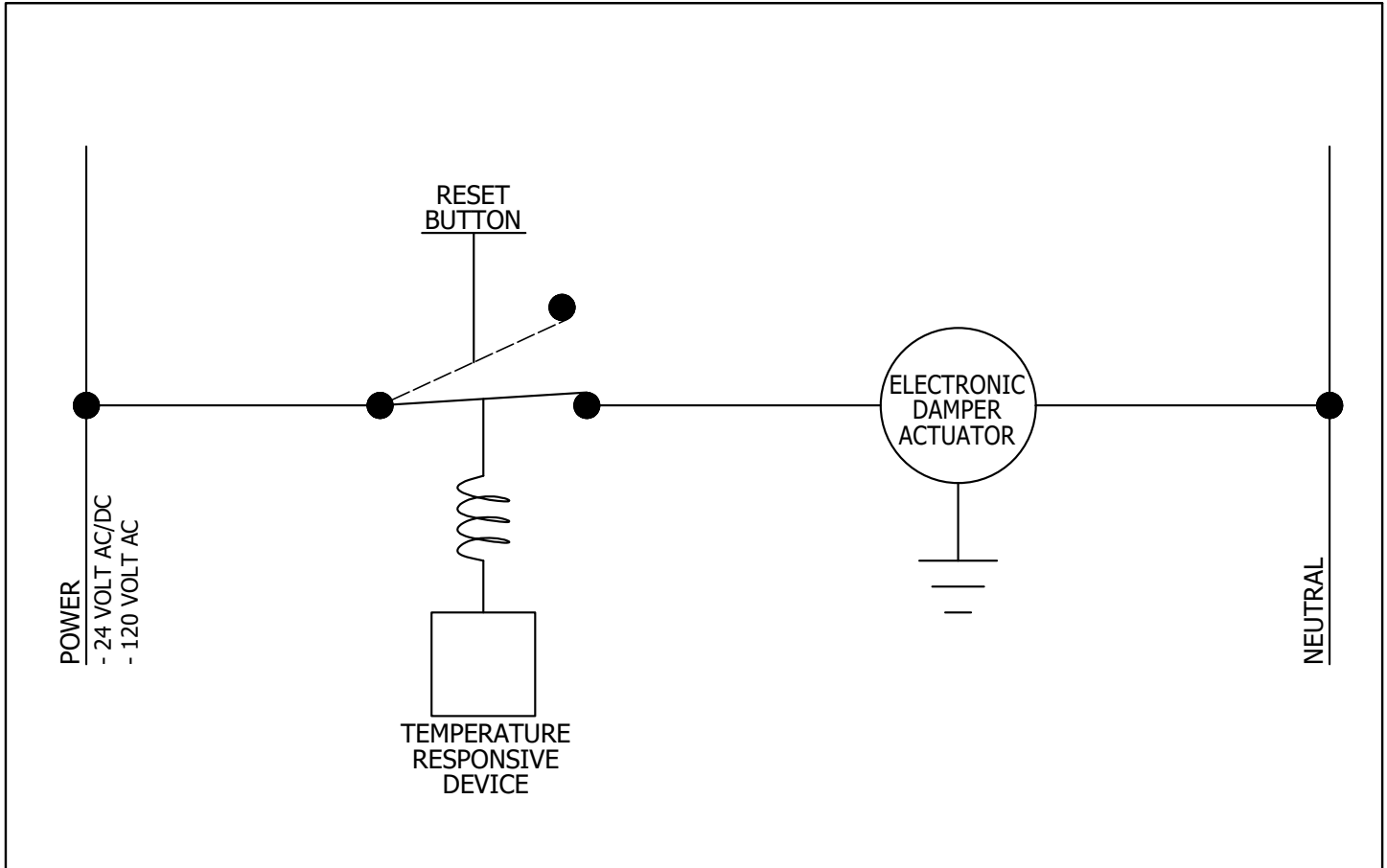


| Item | Description |
|------|-------------------|
| 1. | Fire Wall |
| 2. | Duct |
| 3. | Sleeve |
| 4. | Fusible Device |
| 5. | Operator/Actuator |
| 6. | Chalking Material |
| 7. | Retaining Angle |



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WIRING DIAGRAM



Actuators:

Aire Technologies' combination fire & smoke dampers are equipped with factory-installed actuators which operate on the detection of heat or loss of actuator power.

Once damper is installed, it must be cycled several times to ensure proper function.

WARNING – do not open actuator housing!



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