

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.



These instructions apply to 1½ hour rated fire and combination fire smoke dampers mounted in: 1) masonry, block, or stud walls and 2) concrete floors. Specific requirements in these instructions are mandatory. Dampers must be installed in accordance with these instructions to meet the requirements of UL 555 and/or UL 555S.

Note: Combination fire smoke and fire dampers are manufactured and labeled for either vertical or horizontal installation. The dampers must be installed in accordance with labeling.

Receiving and Handling

Upon receiving dampers, check for both obvious and hidden damage. If damage is found, record all necessary information on the bill of lading and file a claim with the final carrier. Check to be sure that all parts of the shipment, including accessories, are accounted for.

Dampers must be kept dry and clean. Indoor storage and protection from dirt, dust, and the weather is highly recommended. Do not store at temperatures in excess of 100°F (38°C).

SAFETY WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.

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General Information

“UL CLASSIFIED (see complete marking on product)”
“UL CLASSIFIED to Canadian safety standards (see complete marking on product)”
Standard 555 & 555S (Listing #R13317)

Electrical Guidelines

Electrical Guidelines

All wiring shall be done in accordance with the National Electrical Code ANSI/NFPA-70 latest edition, any local codes that may apply, and wiring diagrams developed in compliance with the job or project design and specifications

Important!

Electrical input may be needed for this equipment. This work should be performed by a qualified electrician. Verify power before wiring actuator. Greenheck is not responsible for any damage to, or failure of the unit caused by incorrect field wiring. To avoid causing death or serious bodily harm to building occupants, follow all instructions carefully. Dampers must close completely to preserve the integrity of the fire smoke separation.

Pre-Installation Guidelines

The following items will aid in completing the damper installation in a timely and effective manner.

- 1) Check the drawings for proper damper locations within the building. Visually inspect the damper for damage and verify that the Reusable Resettable Link (RRL) is in place and has not activated if provided. These electric links have a button for resetting. Visually inspect the fusible link (if provided) to verify its not missing or broken. Replace link as necessary.
- 2) Lift or handle damper using sleeve or frame. Do not lift damper using blades or actuators.
- 3) Damper must be installed into duct or opening square and free of twist or other misalignment. Out of square, racked, twisted or misaligned installations can cause excessive leakage and/or torque requirements to exceed damper/actuator design.
- 4) Damper and actuator must be kept clean and protected from dirt, dust and other foreign materials prior to and after installation. Examples of such foreign materials include but are not limited to:
 - a) Mortar dust
 - b) Drywall dust
 - c) Firesafing materials
 - d) Wall texture
 - e) Paint overspray
- 5) Damper should be sufficiently covered as to prevent overspray if wall texturing or spray painting will be performed within 5 feet of the damper. Excessive dirt or foreign material deposits on the damper can cause excessive leakage and/or torque requirements to exceed damper/actuator design.
- 6) Caulking is not necessary, nor is it allowed, between the damper sleeve and the wall or floor opening (annular space). However, caulking may be applied to the retaining angles.
- 7) ACCESS: Suitable access (such that RRL's and actuators can be maintained, etc.) must be provided for damper inspection and servicing. Where it is not possible to achieve sufficient size access, it will be necessary to install a removable section of duct. (Refer to NFPA 90A).
- 8) The Code Authority Having Jurisdiction (AHJ) must evaluate and provide approval of final installation where variations to these instructions are necessary.

Preparation of Openings

- Frame wall openings as shown below (see **Figure 1, 2, & 2A**).
- Gypsum wall board must be fastened 12 in. (305 mm) on center (O.C.) to all stud and runner flanges surrounding opening (see **Figure 1, 2, & 2A**).
- Prepare opening between studs and sleeve assembly as shown below (see **Figure 3 & 4**).
- All construction and fasteners must meet the requirements of the appropriate wall design (See UL Fire Resistance Directory) and/or local codes.

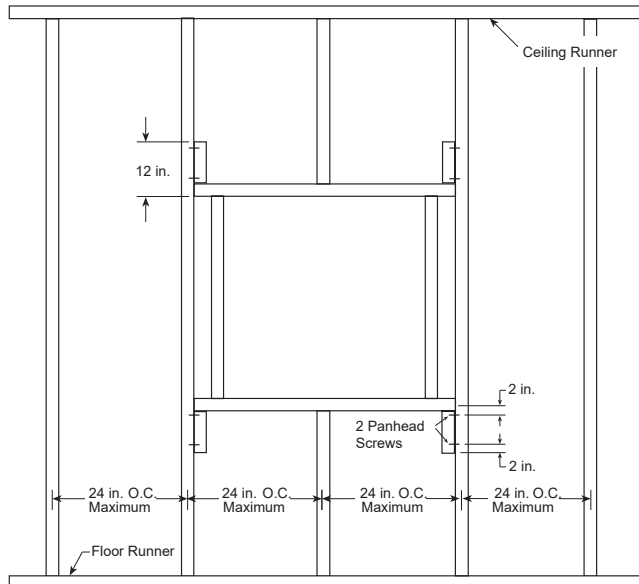


Figure 1

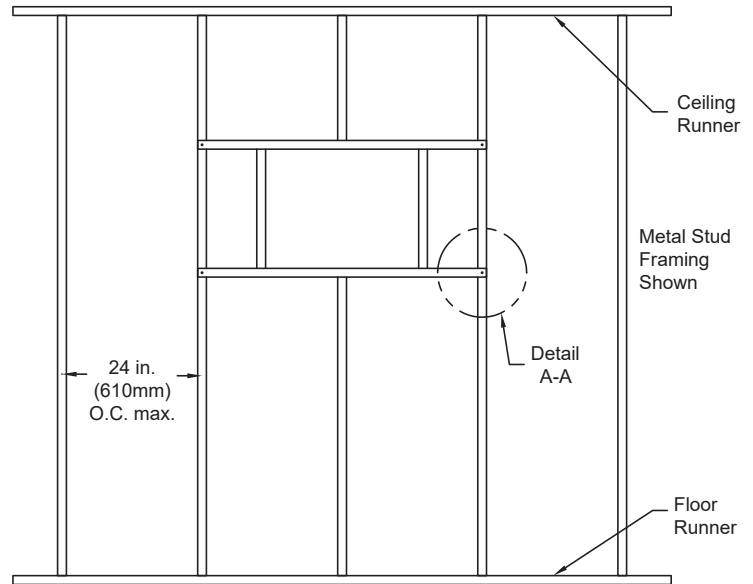
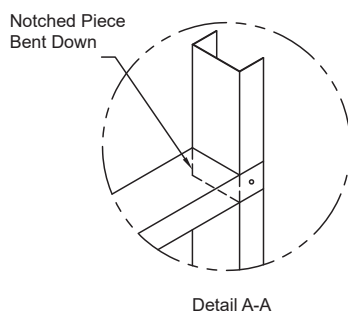


Figure 2

Metal stud only



Detail A-A

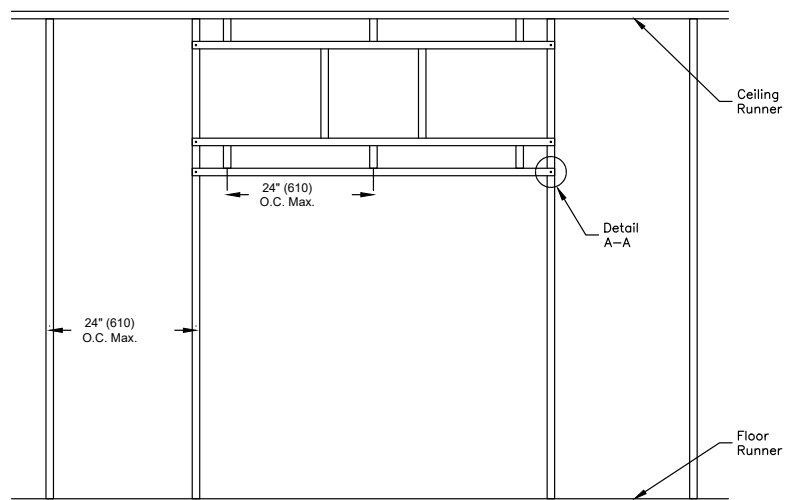


Figure 2A

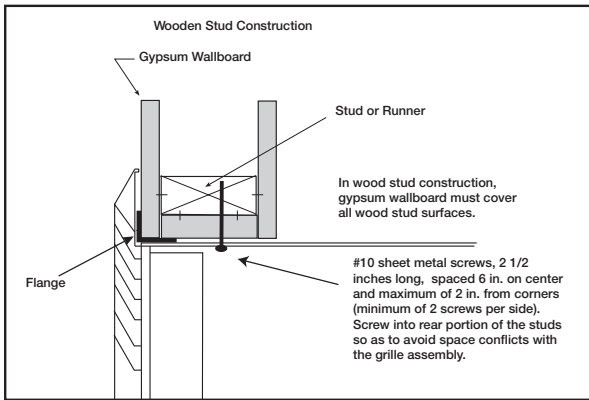


Figure 3 - Wood Stud

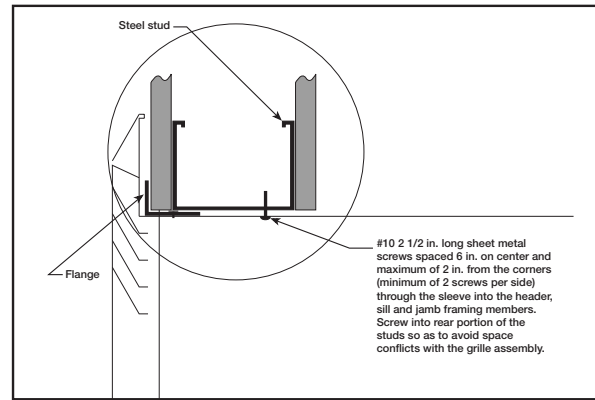


Figure 4 - Metal Stud

Clearances Required Between Damper Sleeves & Wall/Floor Openings

There is no minimum clearance requirement between the wall/floor opening and the sleeve exterior (with thermal blanket attached). However, to facilitate installation, clearances between the wall/floor opening and the damper sleeve are recommended. Although there is no maximum allowable clearance, the minimum overlap requirements between the wall/floor and the flange/retaining angle must be met. On grille mount installations the flange must overlap the wall/floor by $\frac{1}{2}$ in. (13 mm).

On continuous duct installations the retaining angles must overlap the wall/floor by 1 in. (25 mm). No clearances are required between the wall/floor opening and the sleeve. Note that the dampers may not be installed in the plane of the wall using this installation method.

Inserting Damper into Wall Openings

Figures 5 and 6 show installations for grille access applications. Figure 7 shows continuous duct installation.

The following maximum distances outside the barrier apply:

- Steel stud and masonry barriers:
 - 8½ in. (216 mm) provided the width and height of the damper are both 24 in. (610 mm) or less and the damper sleeve is 20 gauge
 - 7½ in. (191 mm) in all other instances
- Wood stud walls: 6½ in. (165 mm)

To provide "through the grille" access to the damper actuator, the damper is located toward the back of the sleeve and the actuator is installed between the damper and grille. Actuator and damper can be accessed and serviced by removing the grille.

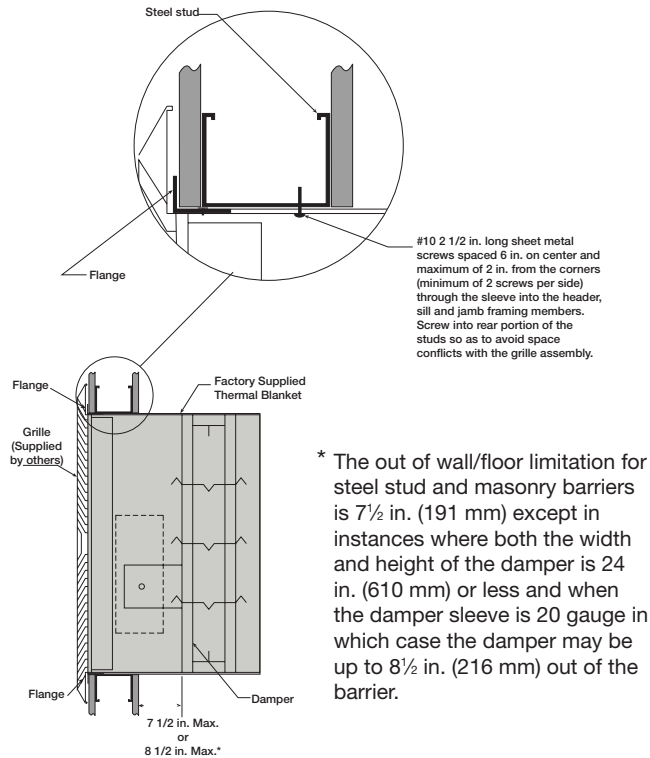


Figure 5: Through the Grille Access - Duct Terminates Metal Stud

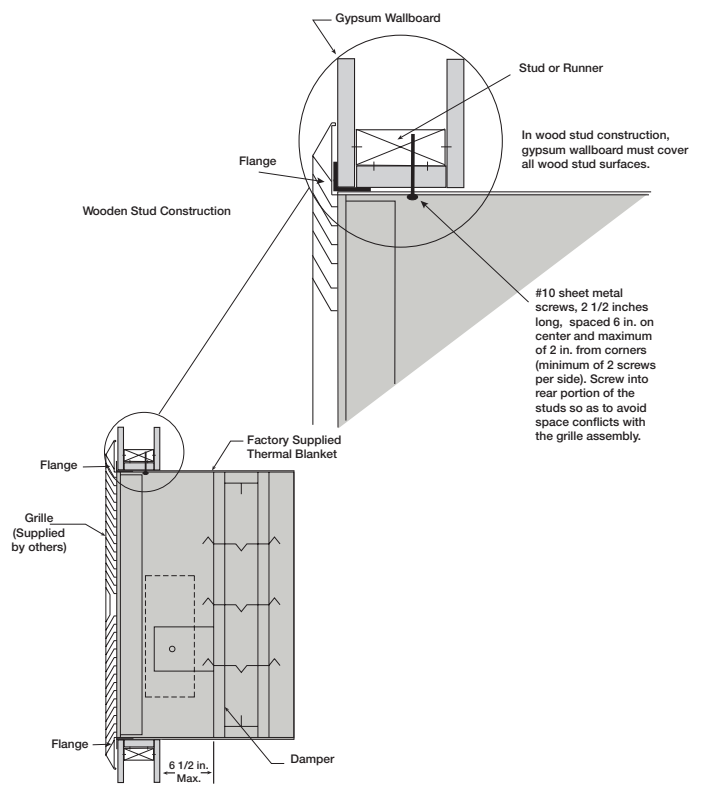


Figure 6: Through the Grille Access - Duct Terminates Wood Stud

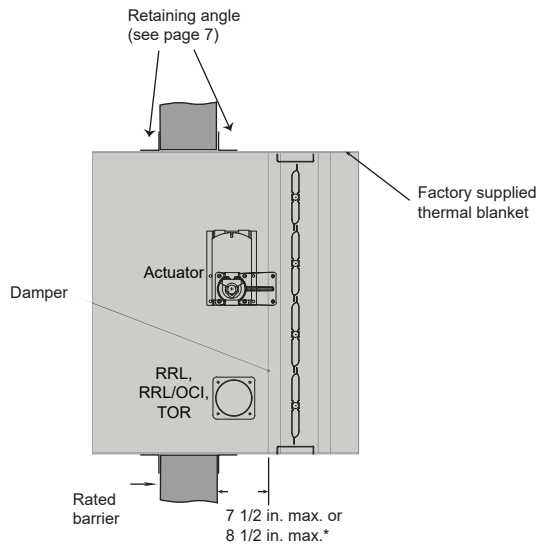


Figure 7: Continuous Duct - Vertical Mount

Inserting Damper into Floor Openings

Figures 8-10 show installations for grille access and continuous duct applications.

The following maximum distances outside the barrier apply:

- Masonry barriers:
 - 8½ in. (216 mm) provided the width and height of the damper are both 24 in. (610 mm) or less and the damper sleeve is 20 gauge
 - 7½ in. (191 mm) in all other instances

To provide access to the damper actuator for continuous ductwork, refer to the requirements of NFPA 90A.

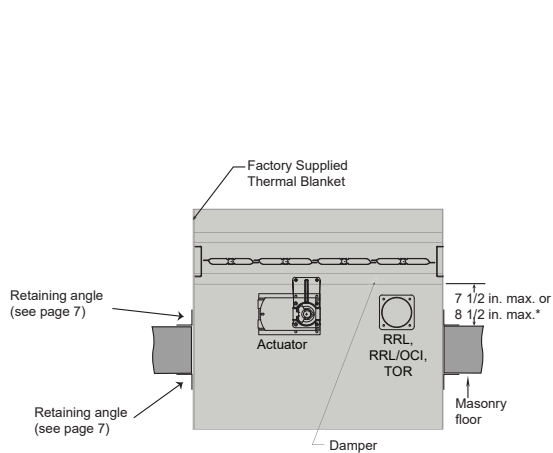


Figure 8: Continuous Duct - Horizontal Mount

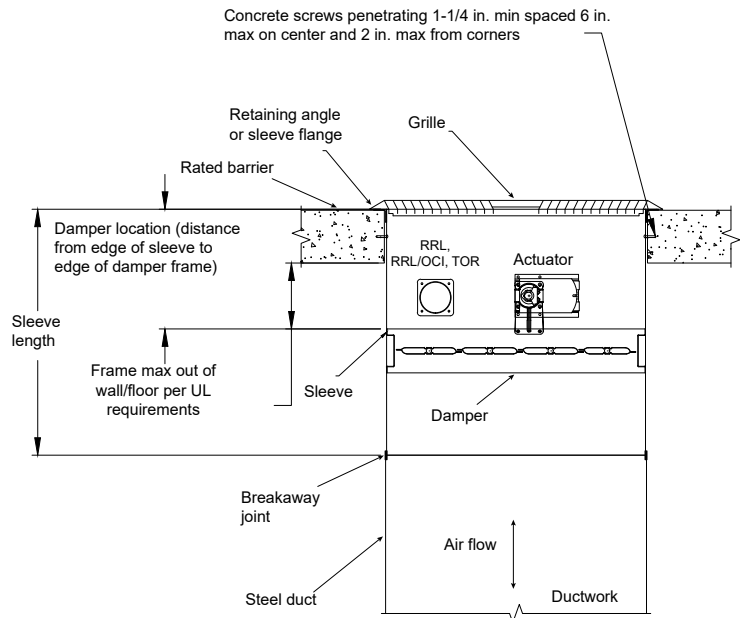


Figure 9: Damper Below Floor

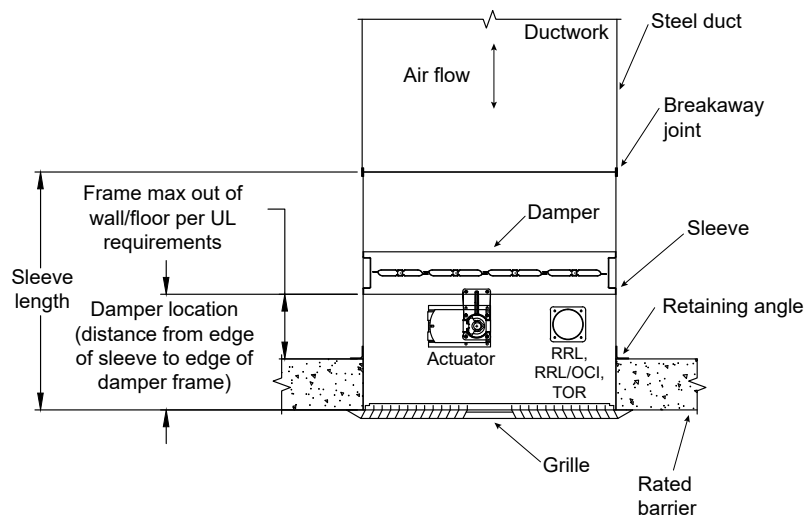


Figure 10: Damper Above Floor

Securing the Damper/Sleeve Assembly to Wall/Floor Openings

Damper/sleeve assemblies must be installed in wall openings using flanges (grille mount) or retaining angles (continuous duct) and sheet metal screws as illustrated and described below.

• Grille Mount

Flange on front (grille end) of sleeve must be a minimum of 16 ga. (1.5 mm) steel and have $\frac{5}{8}$ in. (16 mm) minimum flange leg (refer to **Figures 5, 6, 9, 10, 11**). Using #10 (19 mm) sheet metal screws, screw from inside of sleeve through the rear portion of the studs (as shown in **Figures 3 & 4**). Space screws a maximum of 6 in. (152 mm) O.C. and a maximum of 2 in. (51 mm) from the corners (minimum of 2 screws per side). No retaining angles are required on the side of the wall opposite from the grille.

For masonry barriers, use concrete screws penetrating $\frac{1}{4}$ in. min and spaced 6 in. max on center and 2 in. max from corners (as shown in **Figure 9**).

• Continuous Duct

This method requires retaining angles on both sides of the barrier. Retaining angles for $1\frac{1}{2}$ hour rated dampers with a width 48 in. (1219 mm) or less must be a minimum of 20 ga. (1 mm). The leg of the retaining angle on the damper sleeve shall be a minimum of $\frac{1}{4}$ in. (32 mm). The leg of the retaining angle on the wall/floor shall be long enough to cover the annular space and overlap the wall/floor by a minimum of 1 in. (25 mm). See **Figures 7, 8, and 12**.

• **Retaining angles** must be attached to the damper using one or more of the following methods of attachment:

- Tack or spot welds
- #10 ($\frac{3}{4}$ in. [19 mm] max.) sheet metal screws
- $\frac{1}{4}$ in. (6 mm) bolts and nuts
- $\frac{3}{16}$ in. (5 mm) steel pop rivets

Attachments must be spaced a maximum of 6 in. (152 mm) on center and a maximum of 2 in. (51 mm) from corners. The angles must be attached to all four sides of the sleeve. A minimum of two attachments are required on each side, top and bottom. The angles need not be attached to each other at the corners. **Note:** Retaining angles should not be attached to the barrier.

Caution! Do not tear the thermal blanket during installation.

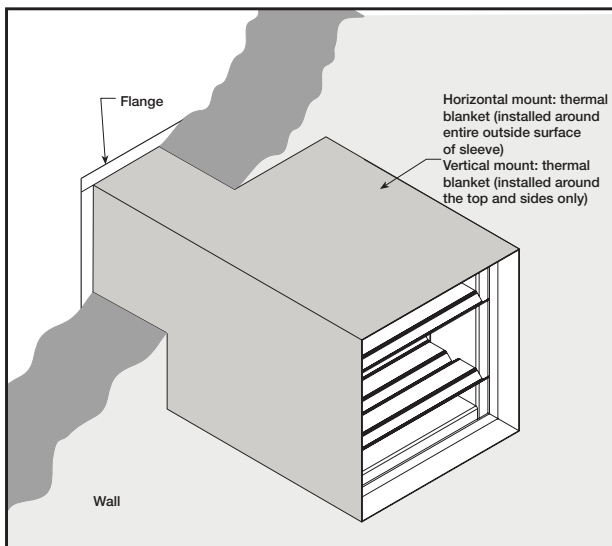


Figure 11: Sleeved Damper with Thermal Blanket (duct termination)

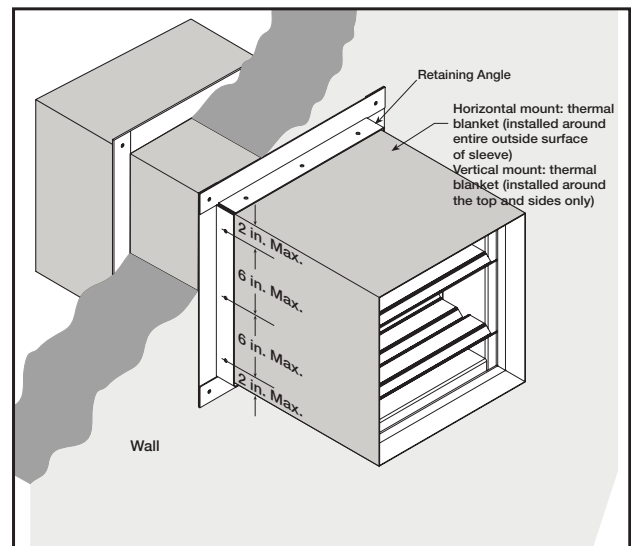


Figure 12: Sleeved Damper with Thermal Blanket (continuous duct).

Duct to Sleeve Connection

Sleeve Gauge and Connection Type Requirements

The size of the damper/duct determines the required sleeve gauge and the required duct to sleeve connection (see table below). Any duct connection other than the breakaway connections described below are considered rigid. When using rigid connections the damper sleeve thickness must not be less than the gauge of the connecting duct.

Sleeve Gauge	Duct Dimension	Type of Duct to Sleeve Connection Permitted
14 ga. (0.075 in.) - 10 ga. (0.138 in.) [2 mm - 3.5 mm]	All duct sizes	Rigid or Breakaway
16 ga. (0.060 in.) [1.5 mm]	36 in. (914 mm) max. width 24 in. (610 mm) max. height 24 in. (610 mm) diameter	Rigid or Breakaway
16 ga. (0.060 in.) [1.5 mm]	All duct sizes	Breakaway only
18 ga. (0.048 in.) [1.2 mm]	85 in. (2159 mm) wide and over	
20 ga. (0.036 in.) [0.9 mm]	55 in. - 84 in. wide (1397 mm - 2134 mm)	
22 ga. (.030 in.) [0.76 mm]	31 in. - 54 in. wide (787 mm - 1372 mm)	
24 ga. (0.024) [0.6 mm]	13 in. - 30 in. wide (330 mm - 762 mm)	
26 ga. (0.018 in.) [0.46 mm]	12 in. wide and under (305 mm)	
See Breakaway Connection section for additional information. UL Standard 555 requires all ducts to terminate at fire damper sleeves.		

Approved Breakaway Connections

All breakaway connections described below may utilize the following duct sealants: PA2084T duct sealant adhesive manufactured by Precision, DP1010 water base duct sealant manufactured by Design Polymerics, Grey Pookie, Ductmate PROseal®, or CL Ward S Seal in accordance with SMACNA recommendations.

Transverse Joints

The transverse joints shown below are approved as breakaway connections.

- A maximum of two #10 (19 mm) sheet metal screws on each side and on the bottom may be used. The screws should be located in the center of the slip pocket and penetrate both sides of the slip pocket.
- Dampers up to 20 in. (508 mm) high may use transverse joints on the top and bottom and Drive Slip joints (see **Figure 14**) on the sides.

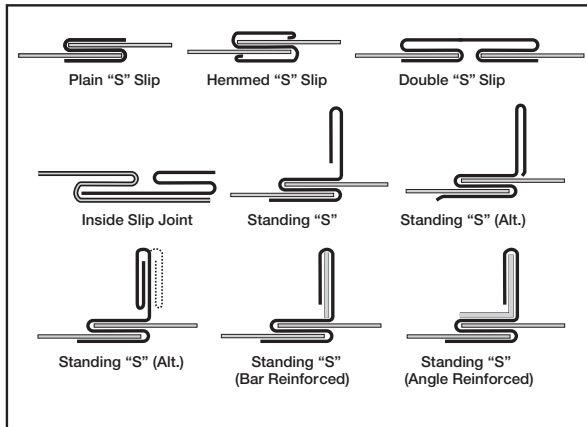


Figure 13



Figure 14

Round and Oval Duct Breakaway Connections

Factory furnished duct collars, type R and O, are also considered breakaway (see **Figure 15**).

Round or flat oval ducts connected to Type R or O damper collars shall be attached with #10 (19 mm) sheet metal screws as follows:

- Ducts up to 22 in. (558 mm) wide (or dia.) and less shall have three screws.
- Ducts larger than 22 in. (558 mm) wide (or dia.) up to and including 36 in. (914 mm) wide (or dia.) shall have five screws.

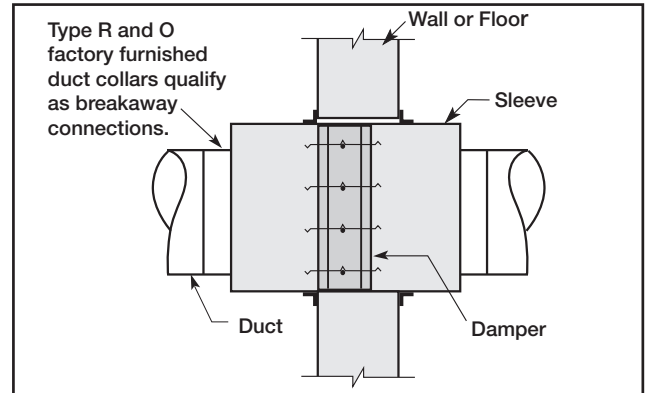


Figure 15: Type R and O Transition

Manufactured Flanged System Breakaway Connections

Flanged connection systems manufactured by Ductmate, Durodyne, Ward, Nexus, Radiant T-35m, and MEZ are approved as breakaway connections when installed as illustrated (see Figure 16).

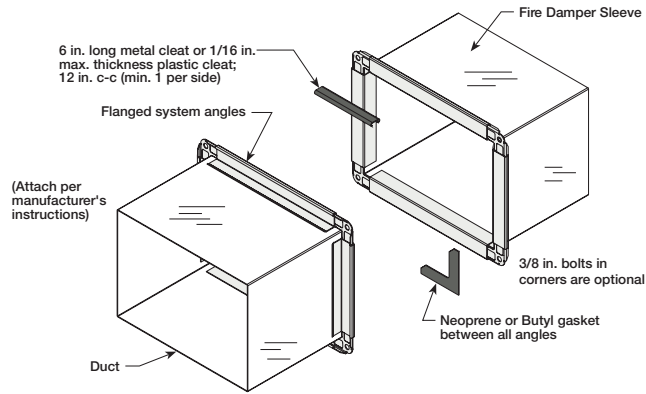


Figure 16

Proprietary Flanged 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. Standard 6 in. (152 mm) metal clips may be used with spacing as shown in diagram (see Figure 17 & 18). A 3/8 in. (9.5 mm) metal bolts and nuts may be used to fasten together corner pieces (see Figure 19).

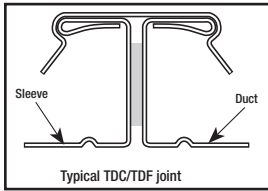


Figure 17

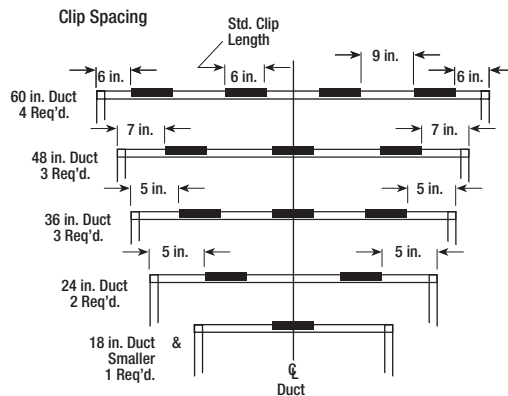


Figure 18

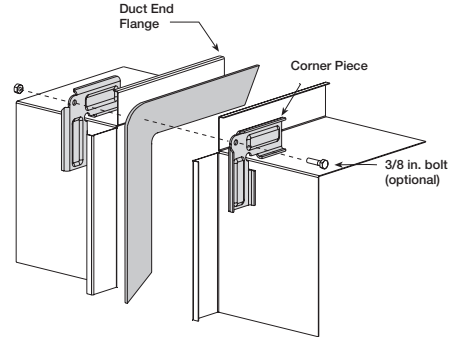


Figure 19

TDC/TDF to Manufactured Flange

Flanged connection systems manufactured by Ductmate, Durodyne, Ward, Nexus, Radiant T-35m, and MEZ can be connected to TDC and TDF system as an alternate breakaway connection. This alternate connection is covered under the UL certification of the damper. See Supplement: Duct-Sleeve Connection (IOM #468502) for more information.

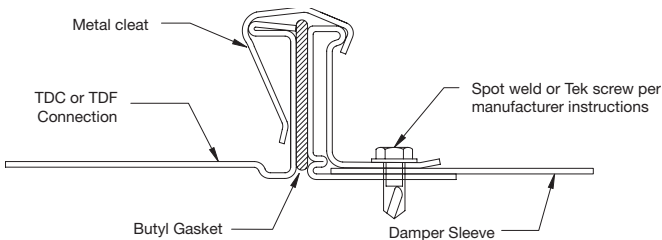


Figure 20: Metal cleat method

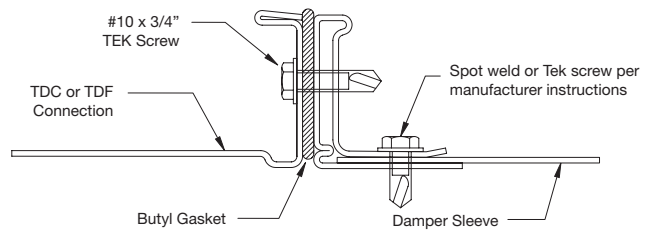


Figure 21: Screw method

Actuator and Temperature Response Device Connections

Actuator Connections

Electrical and/or pneumatic connections to damper actuators should be made in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations (see **Electrical Guidelines**). A penetration through the damper sleeve may be necessary to accommodate the required wiring and/or pneumatic tubing.

Temperature Response Device Connections

RRL: The RRL (reusable resettable link) incorporates a single thermostat. When the thermostat temperature is reached the sensor interrupts power to the actuator and the actuator's spring return mechanism causes the damper to close. Refer to **Figure 22** for wiring of the RRL thermostat.

OCI: The OCI (open or closed indicator) option contains two single pole single throw switches used to indicate the damper blade position. The switches provide a positive open and closed signal and can be used in conjunction with remote indicator lights. Refer to **Figure 23** for wiring of the OCI option.

RRL /OCI: The RRL/OCI performs the function of an RRL and OCI (see description above). Refer to **Figure 24** for wiring of the RRL/OCI option.

TOR: The TOR (temperature override device) option incorporates two thermostats with fixed settings (usually 165°F [74°C] and 350°F [177°C]). The primary sensor (the sensor with the lower temperature setting) can be bypassed by an external contact closure allowing the damper to reopen until the secondary temperature is reached (the sensor with the higher temperature setting). See **Figure 25**.

The TOR assembly contains two single pole single throw switches used to indicate damper blade position. The switches provide a positive open and closed signal and can be used in conjunction with remote indicator lights. See **Figure 25** for wiring of the TOR thermostats and indicator switches.

If either the TOR or the RRL is ordered with a pneumatic actuator, an EP switch is required with an appropriate electric power circuit to allow the electric thermostat to control the pneumatic actuator.

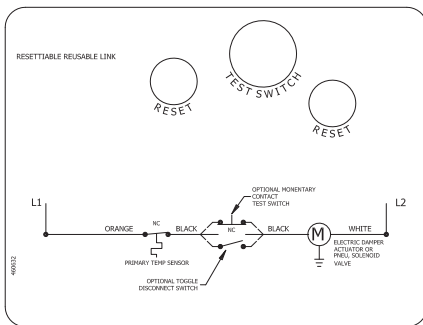


Figure 22: RRL Wiring

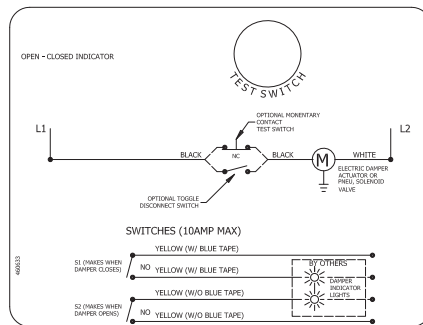


Figure 23: OCI

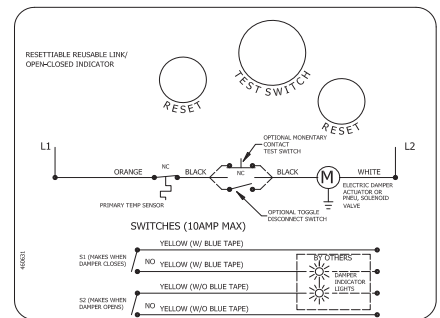


Figure 24: RRL/OCI

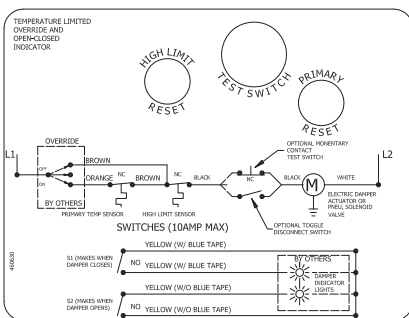


Figure 25: TOR

Ratings (Figure 22, 23, 24, & 25)

Integral Switch Type: Single Pole, double throw

Electrical Capacity: 10 Amps, 1/3 hp, 120 or 240 Vac

1/2 Amp, 125 Vdc;

1/4 Amp 250 Vdc

5 Amps, 120 Vac "L" (lamp load)

1.0 Amps, 24 Vac

1.5 Amps, 24 Vdc

Temperature Limit: 165° F (standard primary sensor)

212° F (optional primary sensor)

250° F (secondary sensor)*

350° F (secondary sensor)*

* based on actuator temperature rating

Damper Commissioning and Periodic Testing

The International Fire Code (IFC) requires fire dampers to be maintained in accordance with NFPA standard 80 and smoke dampers to be maintained in accordance with NFPA standard 105. NFPA 80 and 105 define the frequency and method for periodically testing life safety dampers.

NFPA 80 & 105 do not require heat to be applied to a damper's fusible link or thermostat during periodic testing. Electric or pneumatic actuated dampers are required to be tested by temporarily removing electrical or pneumatic power from the actuator to ensure the damper fully closes and then fully opens once power is restored. Mechanical and gravity operated dampers utilizing a fusible link are required to be tested by removing the fusible link and allowing the damper to fully close and then manually reopening the damper re-installing the fusible link.

Greenheck's life safety dampers shall not be tested by applying heat with uncontrollable heat sources (i.e. heat guns, torches, etc.) as this can permanently damage the thermostat or other parts of the damper.

Damper Maintenance

Dampers do not typically require maintenance as long as they are kept dry and clean. If cleaning is necessary, use mild detergents or solvents. If lubrication is desired for components such as axle bearings, jackshaft bearings and jamb seals, do not use oil-based lubricants or any other lubricants that attract contaminants such as dust.

Dampers and their actuator(s) must be maintained, cycled, and tested at minimum in accordance with:

- The latest editions of NFPA 80, 90A, 92, 101, 105, UL864, AMCA 503-03 and local codes.
- Actuator manufacturer recommendations.

Damper Troubleshooting

The following is a possible cause and correction list for common concerns with the dampers.

Symptom	Possible Cause	Corrective Action
Damper does not fully open and/or close	Frame is 'racked' causing blades to bind on jamb seals	Adjust frame such that it is square and plumb
	Actuator linkage loose	Close damper, disconnect power, adjust and tighten linkage
	Defective motor	Replace
	Screws in damper linkage	Damper installed too far into wall. Move out to line as designated on damper label
	Contaminants on damper	Clean with a non-oil based solvent (see Damper Maintenance)
RRL or TOR sensor tripped	Heat	Push reset button located on backside of RRL or TOR
Damper does not operate	No power supplied to the actuator	Add power supply

Our Commitment

As a result of our commitment to continuous improvement, Venco reserves the right to change specifications without notice.



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