These instructions cover the installation of CFSD-XXX leakage rated combination fire smoke dampers with factory installed actuators and sleeves in corridor ceiling applications. These instructions meet the requirements of UL 555 and UL 555S.

There are three different configurations available for this application. Configurations 1 and 2 apply when the fire rated ceiling is also the finished ceiling and the damper is installed behind a grille, register, or diffuser. Configuration 3 applies when the fire rated ceiling is above the finished ceiling and the grille, register or diffuser is somewhere below the corridor damper.

Table of Contents

- General Information .............................................. 2
- Pre-Installation Guidelines ................................. 2-3
- Electrical Guidelines ........................................ 2
- Installation .......................................................... 3-7
  - Preparation of Openings ................................ 3
  - Clearances Required Between Damper Sleeves & Ceiling Openings ........... 3
  - Sleeve Length Requirements ............................. 3-4
  - Maximum Assembly Tables ............................... 4
  - Securing the Damper/Sleeve Assembly to Ceiling Openings .............. 4-5
  - Duct to Sleeve Connection ............................... 5-6
  - Actuator & Temperature Response Device Connections .................. 7
- Maintenance ..................................................... 8
- Troubleshooting ............................................... 8

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.

This manual is the property of the owner and is required for future maintenance. Please leave it with the owner when the jobs is complete.
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)

Installation Supplements
Refer to the appropriate Greenheck installation supplements for special requirements:

• Concrete Floor with Steel Deck
• Drive Slip Breakaway Connection
• Fusible Link Replacement
• Greenheck Test Switch
• Open or Close Indicator (OCI)
• Quick Connect Breakaway Connection
• Resettable Link (RRL)
• Resettable Link with Blade Indicator (RRL/OCI)
• Sealant Supplement
• Single Side Retaining Angle
• Smoke Detector - Various Types
• Temperature Limited Override (TOR)


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 link 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 has label on outside of sleeve indicating a ‘No Screw’ area. Do not install screws into this area as screws may interfere with unexposed blade linkage and prevent damper blades from opening and/or closing.

4) Damper has label indicating position of damper and sleeve assembly in the wall. Install accordingly to comply with manufacturer’s appropriate UL Classification file number.

5) 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.

6) 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

7) 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.

8) 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.

9) 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).

10) The Code Authority Having Jurisdiction (AHJ) must evaluate and provide approval of final installation where variations to these instructions are necessary.

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.
Preparation of Openings

- Corridor dampers are rated in ceiling constructions with a fire resistance rating of one hour.
- Frame wall openings as shown below. Maximum size of opening is 24 in. x 24 in. (610mm x 610mm). (see Figure 1 & 2).
- Corridor ceiling must be covered with a minimum of one sheet of 5/8 in. UL rated gypsum board on both sides.
- All construction and fasteners must meet the requirements of the appropriate corridor ceiling design. Gypsum panels should be attached, 12 in. (305mm) O.C. maximum, to all stud and runner flanges surrounding opening with fasteners as designated by the appropriate corridor ceiling design. (See UL Fire Resistance Directory) and/or local codes.

![Figure 1](Steel Stud Assembly)

![Figure 2](Wood Stud Assembly)

Clearances Required Between Corridor Damper Sleeves and Ceiling Openings

The interior dimension of the prepared ceiling opening should be 1/4 in. (6mm) larger than the overall size of the damper and sleeve assembly.

These are total clearances (ignoring fastener heads) and do not need to be spaced equally around the damper.

Maximum Assembly Table

<table>
<thead>
<tr>
<th>Damper Model</th>
<th>Maximum Single Section Size (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFSD-211, -212</td>
<td>24 x 24</td>
</tr>
</tbody>
</table>
Securing the Damper/Sleeve Assembly to Ceiling Openings

Corridor damper and sleeve assemblies must be installed in fire rated ceiling openings using retaining angles on each side of the ceiling as described below:

**Installation of Configurations 1 & 2.**

- Retaining angles must be a minimum of 20 ga. (1mm) steel and have a minimum of 1½ in. x 1¼ in. (38mm x 32mm) legs on the ducted side of the installation and 1 in. x 2½ in. (25mm x 64mm) legs on the diffuser, grille or register side.
- The 1 in. x 2½ in. (25mm x 64mm) angle may be mounted with the 2½ in. (64mm) leg inside or outside the sleeve.

**Configuration #1**

*(Actuator in airstream only)*

Allows access to the actuator through the grille or diffuser.

**Configuration #2**

*(Actuator in airstream or out of airstream)*

**Installation Configuration 3**

- Retaining angles must be a minimum of 20 ga. (1mm) steel with 1½ in. x 1¼ in. (38mm x 32mm) legs.
- Retaining angle must be attached to the sleeve using:
  - Tack or spot welds
  - #10 sheet metal screws
  - ⅛ in. (6mm) bolts and nuts
  - ⅜ in. (5mm) steel pop rivets

The angles must be attached to all four sides of the sleeve with butt joints at each corner. A minimum of two attachments are required on each side, top and bottom. The angles may be attached to each other at the corners.
- Retaining angles must cover the clearance space between the sleeve and the ceiling opening.

**Configuration #3**

*(Actuator in airstream or out of airstream)*

Actuator can be installed either above or below ceiling construction.
Duct to Sleeve Connection

Sleeve Gauge and Connection Type Requirements
Dampers are supplied with sleeves and actuators from the factory and can be installed without the need for additional field installed sleeves. Damper sleeves should be a minimum of 24 ga. (0.6mm). The sleeve thickness must also not be less than the gauge of the connecting duct. If duct gauge is 16 ga. (1.5mm) or greater, the breakaway connection is rigid.

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 Polymetrics, 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 (19mm) 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 penetrating both sides of the slip pocket.
- Dampers up to 20 inches (508mm) high may use transverse joints on the top and bottom and Drive Slip joints (see Figure 16) on the sides.

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

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

Manufactured Flanged System Breakaway Connections
Flanged connection systems manufactured by Ductmate, Durodyne, Ward, MEZ, and Nexus are approved as breakaway connections when installed as illustrated (see Figure 10).

![Figure 10](image1.png)

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. Standard 6 in. (152mm) metal clip may be used with spacing as shown in diagram (see Figure 11 & 12). 33/8 in. (9.5mm) metal bolts and nuts may be used to fasten together corner pieces (see Figure 13).

![Figure 11](image2.png)

Clip Spacing

![Figure 12](image3.png)

![Figure 13](image4.png)
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).

Temperature Response Device Connections

RRL - The RRL (resettable link device) 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.

Ratings (Figure 14, 15, 16, & 17)

Integral Switch Type: Single Pole, double throw

Electrical Capacity:
- 10 Amps, 1/3 hp, 120 or 240 Vac
- ½ Amp, 125 Vdc
- ¼ 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 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. Damper and their actuator(s) must be maintained, cycled, and tested a minimum in accordance with:
- Actuator manufacturer recommendations.

---

**Damper Troubleshooting**

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

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

---

**Our Commitment**

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.
Specific Greenheck product warranties can be located on greenheck.com within the product area tabs and listed in the Library under Warrantees.