

Structure of Fire Damper Distribution Box



Overview

The fire damper is used as a shut-off device to prevent fire and smoke from spreading through ducting. During normal operation the damper blade is open to enable air passage through the extract air system.

Key Takeaways

A fire damper distribution box consists of a metal sleeve housing the damper blades, fusible link or actuator, and mounting flanges, designed to fit within fire-rated walls or floors while allowing proper airflow and inspection access. Components and Structure1. Damper Sleeve or Box: The main body of the distribution box is a galvanized or stainless steel sleeve that fits into the wall or floor opening.

It provides structural support for the damper blades and ensures the assembly maintains its fire-resistance rating when installed. The sleeve must be square, free of twist, and aligned with the duct or opening. 2.

Damper Blades: Inside the box are single, multi, or interlocking blades that close automatically in response to heat or an electrical signal. Blades are typically spring-loaded and held open by a fusible link or fail-safe actuator. The blades must be protected from damage during handling and installation.

3. Fusible Link or Actuator: A fusible link melts at a predetermined temperature, releasing the blades to close and block airflow, preventing fire spread. In some systems, an electrically actuated damper may close in response to a fire alarm signal.

4. Mounting Flanges and Retaining Angles: The box includes mounting flanges that secure it to the wall or floor. Retaining angles overlap the opening by at least 1 inch to maintain fire integrity.

Clearances between the damper and sleeve allow for thermal expansion: typically 1/8 inch per foot for galvanized steel and 3/16 inch per foot for stainless steel, with minimum and maximum limits. 5. Access Panels and Identification: Fire damper boxes must provide inspection access large enough to test and maintain the damper without compromising the fire barrier.

Access points are permanently labeled to indicate the type of damper (fire, smoke, or combination),.

Installation Considerations

Orientation: Dampers are labeled for horizontal or vertical installation, and the indicated orientation must be followed.

Wall/

Floor Integration: The box is framed with studs or concrete, and gypsum board or other fire-rated materials are fastened around it to maintain the fire-resistance rating. Clearances: Proper gaps between the damper and opening accommodate thermal expansion while ensuring the damper can close fully. Compliance: Installation must follow UL 555 standards and NFPA codes (NFPA 80, 90A, 105) for fire and smoke protection.

Summary

A fire damper distribution box is a metal housing that integrates damper blades, actuators, and mounting hardware within a fire-rated wall or floor. Its design ensures automatic closure during fire events, maintains fire-resistance integrity, and provides access for inspection and maintenance. Proper installation, orientation, and compliance with NFPA and UL standards are critical for effective fire protection.

Article Content

Fire damper

The fire damper is used as a shut-off device to prevent fire and smoke from spreading through ducting. During normal operation the damper blade is open to enable air passage through the extract air system.

A.II Fire Dampers

To provide for both these requirements, fire dampers are provided within or fixed to spigots or coamings which are welded to the structural core and are insulated to the same standard as the division.

Fire Dampers and Smoke Dampers

Learn how Fire Dampers and Smoke Dampers work. See where and why they are used in commercial construction.

Fire damper

Ducting must be installed in such a way that it does not impose any significant loads on the fire damper in the event of a fire. This means avoiding angles, warping or bends in the ducting as far as possible.

Fire Damper Installation, Configuration and Joint Method

Fire dampers are one of the most critical components in HVAC. They prevent fire from spreading from one room to the other rooms. However, incorrect installation can lead to a fire

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Duct between fire damper and fire separating construction must be suspended by using threaded rods and mounting profiles, or another anchoring system according national standards.

Smoke and Fire Dampers in HVAC Systems

Dampers are louvred vents or shutters situated at key points within the ducting system. The fire resistance requirements of fire dampers and fire walls are described in Approved Document B. In

How Do Fire Dampers Work? HVAC & Smoke Damper

How do fire dampers work? Learn how HVAC fire dampers and fire smoke dampers prevent fire spread and enhance building safety.

Dampers UL Marking and Application Guide

This marking and application guide provides important information on limiting the spread of fire, smoke and toxic gases by protecting duct penetrations and air-handling openings in fire and smoke rated

What Is Fire Dampers? Definition, Function, and

In modern HVAC systems, fire dampers play a vital role in maintaining building safety by preventing the spread of fire and smoke through

SMACNA Fire, Smoke & Radiation Damper Installation

Corridor Damper. Prevents the spread of fire and smoke past the damper in a corridor ceiling where the corridor is constructed as a fire-resistance

Life Safety Dampers Selection and Application Manual

Fire Damper Application Fire dampers are required by all building codes to maintain the required fire resistance ratings of walls, partitions, barriers and floors when they are penetrated by air ducts or

Fire Safety Basics. Part Two: Fire Damper Types,

Explore the different fire damper types, control systems, and testing methods, including CE-marking requirements and European fire safety

What is a Fire Damper and Why is It Important?

Discover the importance of fire dampers in building safety. Learn what fire dampers are, how they work, and why regular inspections are crucial for fire prevention and compliance. Tyger

Your Questions About Life-Safety Dampers Answered

Experts on fire, smoke, and combination fire/smoke dampers from Air Movement and Control Association (AMCA) International member companies

Fire Dampers in HVAC: The Ultimate Guide to Types,

In the world of building safety and HVAC design, few components are as critical—yet often overlooked—as fire dampers. While fire alarms and

FIRE DAMPER INSTALLATION, OPERATION & MAINTENANCE

Application & General Notes: These installation instructions apply to Fire Dampers of the stat-ic, dynamic, curtain-style, single and multi-blade types mounted in the plane of a UL* approved fire

Fire and Smoke Dampers: Everything You Need to Know in 2026

How to install, test and maintain fire dampers & smoke dampers to remain compliant, so you can ensure the health and wellbeing of your building's occupants

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

