Combination Fire and Smoke Dampers, Smoke Dampers, Curtain and Multiple Blade Fire Dampers and Ceiling Fire Dampers
## How to Use This Document

This is an interactive, dynamic document, best utilized within a PDF viewer. There are live links built-in throughout the document. All blue text links to either a website or another page within this document. Also, the bottom of every page includes “jump to” links to speed up navigation within this document.

## RUSKIN LABOR SAVERS

### LINK TO UL "Marking and Application Guide"

### OPERATION, MAINTENANCE AND REPORTS

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### TESTING AND MAINTENANCE OPTIONS

- **II-ClassicDi-4B-413** - Classic Damper Inspector
- **Spec WirelessDi-1212** - Wireless Damper Inspector
- **II-DTS-514** - Electronic Resettable Fuse Link with Damper Test Switch “DTS”
- **II-DTS-SD-1212** - Damper Test Switch for Smoke Dampers
- **Spec MCP3/34-305** - Single Damper Control Panel “Lights Only”
- **Spec MCP4/44-305** - Single Damper Control Panel “Lights and Test Switch”
- **Spec MCPB/1.5-305** - Single Damper Control Panel “On/Off or Test Switch” “No lights”
- **Spec MCP1/14-305** - Single Damper Control Panel “For use with TS-150 Fire Stat”
- **Spec MCP10/20-305** - Multiple Damper Control Panel “For use with TS-150 Fire Stat”

### Product Data Description

#### COMBINATION FIRE/SMOKE DAMPERS

**Combination Fire Smoke Damper Selection and Application Guide**

- **FSD60LP, FSD60-2LP, FSD37LP, FSD36LP**
  - Low Profile, Ultra-Low Pressure Drop 1 ½ hour Rated; Class 1 or 2 leakage
  - **II-FSDLP-514**
- **FSD60, FSD60-2, FSD60V**
  - True Round Ultra-Low Leakage Class I, 1 ½ hour Rated (II-FSDR25-514)
  - **II-FSDR60(SS)-514**
- **FSD60M**
  - FSD60 Series High Performance Class I, II and III, 1 ½ hour Rated
  - **II-FSD60-514**
- **FSD60-BAL, FSD60-XP**
- **FSD35, 36 and 37**
  - FSD35 Series Class I, II and III 1 ½ hour Rated
  - **II-FSD36-514**
- **FSD60-3, M and BAL**
  - FSD60-3 Series High Performance Class I and II, 1 ½ hour Rated
  - **II-FSD60-3-514**
- **FSD35SS, 36SS, 37SS**
  - Series Class I, II and III, 1 ½ hour Rated
  - **II-FSDSS-514**

#### GRILLE or SHAFT COMBINATION FIRE/SMOKE DAMPERS

- **FSD60FA and FSD36FA**
  - Front Access FSD, Class I and II, 1 ½ hour Rated
  - **II-FSDFA-514**
- **FSFxGA**
  - FSD “Grille Access”, Class I and II, 1 ½ hour Rated
  - **II-FSDGA-514**
- **FSxOW**
  - FSD “Out of Wall”, Class I and II, 1 ½ hour Rated
  - **II-FSDOW-514**
- **FSD60C and FSD36C**
  - “Tunnel Corridor” Fire Smoke Damper, Class I and II, 1 hour Rated
  - **II-FSD60/36C-1**
- **FSDR60C**
  - True Round “Tunnel Corridor” Fire Smoke Damper 1 hour Rated
  - **II-FSDR60C-514**
- **DFSDR1**
  - 1 Round Tunnel Corridor / Ceiling Fire Damper
  - **II-DFSDR1-514**

#### SMOKE DAMPERS

**Smoke Damper Selection and Application Guide**

- **SDRS25 (SS)**
  - True Round Class 1 Leakage Rated Smoke Damper
- **SD50**
  - Aluminum Air Foil Blade Class 1 Leakage Rated Smoke Damper
- **SD60 and SD60-2**
  - Galvanized Air Foil Blade Class 1 and 2 Leakage Smoke Damper
- **SD60V**
  - Galvanized Vertical Air Foil Blade Class 1, 2 Leakage Smoke Damper
- **SD35, 36 and 37**
  - Galvanized Vertical Vee-Grove Blade Class 1, 2 & 3 Leakage Smoke Damper
- **SD35SS, 36SS and 37SS**
  - Stainless Steel Vertical Vee-Grove Blade Class 1, 2 & 3 Leakage Smoke Damper
- **SD60M and BAL**
  - Modulating and Balancing Air Foil Blade Class 1 and 2 Leakage Smoke Damper
- **SD120**
  - Heavy Duty Smoke Damper
  - **II-SD102-514**
### Product Data Description

**CURTAIN & MULTIPLE BLADE FIRE DAMPERS**

*Static/Dynamic Fire Damper Selection Application Guide*

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#### FUSE LINKS and SWITCH PACKAGES

- **II-EFL-514**: Electronic Resettable Fuse Link “EFL”
- **II-DTS-514**: Electronic Resettable Fuse Link with Damper Test Switch “DTS”
- **II-EFLSP-514**: EFL/SP100 Electric Resettable Fuse Link and SP100 Switch Package “EFL/SP100”
- **II-DTS-SD-514**: Damper Test Switch for Smoke Dampers
- **II-TS150-514**: TS150 FireStat for “Reopenable” Fire and Smoke Dampers
- **II-SP100FK-514**: SP100 Switch Package Field Installation Instructions
- **Spec SP200-514**: SP200 Switch Package for Curtain Fire Damper
- **II-PFL-514**: Pneumatic Fuse Link “PFL”
- **Spec FLAP-110**: Fuse Link Replacements

#### SMoke DETECTORS

- **II-DSDF-D4120-514**: System Sensor D-4120 Flow Duct Smoke Detector
- **II-DSDN-2151-714**: System Sensor 2151 No Flow Duct Smoke Detector
- **II-DSDF-DH98-514**: Hochiki DH-98 Flow Duct Smoke Detector
- **II-DSDN-HS100-514**: Air Products and Controls HS-100-P No Flow Duct Smoke Detector

### Ceiling Radiation Dampers

**Ceiling Radiation Damper For Wood Construction**

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RUSKIN
LABOR SAVERS

Fire, Smoke & Combination
Fire/Smoke Dampers

The contractor guide to save time and money
## Labor Savers — Installation Aids

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## Labor Savers — Installation Options

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Save Time  
Save Money  
Save Now!

Ruskin Labor Savers are UL approved products and installation methods for fire, smoke and combination fire/smoke dampers that save contractors money.

Labor Savers can be ordered in three different categories:
- Installation Aids
- Application Solutions
- Installation Options

**#1 Labor Saver**

**One Side Angle Installation**
- Ruskin FAST Angles
- One piece angle shipped with the damper
- Available in 1-1/2" or 2-1/2"
- Metal, wood and masonry walls/floors
- Permits damper installation before or after drywall installation
- Approved for all Ruskin fire, smoke and fire/smoke dampers

**#2 Labor Saver**

**Integral and Factory Sleeves**
- Delivered to jobsite and ready to install
- Many sleeve lengths and gauges
- Eliminates field sleeves and special handling

Ruskin products are made to exacting standards and specifications, and are supported by a technical sales force in every major city nationwide. And, with the Ruskin Express Program we can guarantee your delivery.

RUSKIN.com
**FACTORY ASSEMBLED INTEGRAL SLEEVE**
- Fewer pieces to handle with multiple sections
- Angle option around entire perimeter
- Assembled for larger openings

**UNIVERSAL FLANGE BREAKAWAY CONNECTIONS**
- Breakaway connection with bolted corners and metal cleats
- Breakaway connection with Butyl or Neoprene gaskets
- Factory installed onto the sleeve
- Available on all fire, smoke and combination fire/smoke dampers

**INTEGRAL ACCESS DOORS FACTORY INSTALLED**
- Factory installed between damper and duct connection
- Correct placement of access doors
- Available with all fire and combination fire/smoke dampers

**S-AND-DRIVEMATE BREAKAWAY CONNECTIONS**
- Ruskin’s Drivemate #14880
- Factory hemmed sleeves complement drive mate
- Easy to use, worry free connections that stay joined
RUSKIN TAGGING AND PACKAGING OPTIONS
- Factory packaged by floor or area to eliminate sorting by hand at job site
- Speeds handling of larger orders
- No additional cost

FDR25 AND FSDR25 TRUE ROUND DAMPERS
- Retaining plate one or two sides approved
- Easy installation in round or square openings using cinch plate(s)
- Wood or metal stud walls and masonry walls/floors
- Shipped complete with integral sleeve
- Lower cost than square to round transitions

INSTALLATION AND AIRFLOW IN ANY DIRECTION
- Combination fire/smoke, and smoke damper flexibility
- Bi-directional airflow
- Ability to rotate dampers for actuator access

FENDR AND FSBR TRUE ROUND DAMPERS
- Designed for corridor or shaft wall applications
- Permits Front Access to actuator through grille
- Installs from one side of wall
- Low height dampers
- Shortest assembly depth in the industry
- Does not require retaining angles
### Labour Saver Applications

#### #11: Damper for Grille Installations
- Opening size up to 90" x 48"
- Metal or aluminum grilles or louvers
- Transfer openings installation
- Angle one side installation

#### #12: Corridor Dampers
- Protection for tunnel corridor applications
- Through penetration or grille termination installations
- May be installed in walls as standard combination fire/smoke damper
- Through the grille access to actuator

#### #13: Grille Access Damper
- Permits access to the actuator through grille
- Installs completely from one side of wall
- Does not require retaining angles

#### #14: Out of Wall Damper
- Ideal for renovation and bringing projects up-to code
- Retaining angles required on one side only
- Wood or metal stud walls and masonry walls/floors
**#15 LABOR SAVER**

**SMOKE DETECTORS**
- Available in Flow or No Flow detectors
- Factory mounted on smoke or combination fire/smoke dampers
- Wired for single point connection
- Can be shipped loose

**#16 LABOR SAVER**

**SECURITY BARS**
- Available with fire, smoke and combination fire/smoke dampers
- Available in ½", ¾" and 1" diameter bars
- Factory installed

**#17 LABOR SAVER**

**DAMPER TEST SWITCH DTS**
- Eliminates field wiring to a remote panel
- Allows easy testing of the dampers during installation and commissioning
- Continues to save during required inspection and testing throughout the life of the building

**#18 LABOR SAVER**

**WOOD TRUSS RADIATION DAMPERS CFD7(T)**
- Wood truss or joist construction
- Factory or field supplied plenums
- Assembly designed to accept grills with up to 2½" grille depths
- Through ceiling membrane penetration
#19 **LABOR SAVER**

**OPTIONAL ANGLE SEALANT**
- Ruskin Exclusive!
- Wood or metal stud walls and masonry walls/floors
- Option of using a sealant or fire stop caulking
- Over 12 UL listed materials

#20 **LABOR SAVER**

**OPTIONAL FIRESTOP INSTALLATION**
- Applied to Ruskin fire and combination fire/smoke dampers
- Metal stud walls and masonry walls/floors
- Includes retaining clips
- Provides installation flexibility

#21 **LABOR SAVER**

**OPTIONAL DUCT SEALANTS FOR BREAKAWAY CONNECTIONS**
- Seal the duct to sleeve joint for low-leakage
- Precision — PA2083T
- Hardcast, Inc — Iron Grip 601
- LEED projects
  - Design Polymeric — DF1010 Water Base
  - Eco-Duct Seal — 44-52

#22 **LABOR SAVER**

**FIELD SLEEVE EXTENSIONS**
- Same gage as factory sleeve
- Field caulked with UL listed materials
While required frequency of periodic operation and testing varies by local jurisdiction, most local municipalities’ reference one of two national standards. NFPA 80 covers the requirements for fire dampers and NFPA 105 covers the requirements for smoke dampers. Both documents contain the frequency requirements for periodic operational testing:

In addition, NFPA 72 and NFPA 92 describe the periodic testing requirements for smoke control systems. Dampers that are part of a smoke control system shall be cycled as part of this testing. When possible, the dampers should be operated under normal air flow conditions.

**NFPA 105**

a. After damper installation is completed, an operational test shall be conducted.
b. Each damper shall be tested and inspected 1 year after installation.
c. In buildings not containing a hospital, each damper shall be tested and inspected every 4 years.
d. In buildings containing a hospital, each damper shall be tested and inspected every 6 years.
e. The test shall be conducted with normal HVAC airflow.
f. All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.
g. All documentation shall be maintained by the property owner and available for review by the AHJ

**OPERATIONAL TESTING SMOKE AND FIRE/SMOKE DAMPERS**

**Dampers with Position Indication**

1. Use the signal from the damper’s position indication device as an inspection to ensure the damper is in the fully open position.
2. Remove electrical power (or air pressure) from the actuator allowing the actuator to spring to the fail position.
3. Use the signal from the damper’s position indication device as an inspection to ensure the damper reaches the fully closed position.
4. Reapply electrical power (or air pressure) to open the damper.
5. Use the signal from the damper’s position indication device as an inspection to ensure the damper reaches the fully opened position.

**Dampers without Position Indication**

1. Visually confirm that the damper is in the fully opened position.
2. Ensure that all obstructions are out of the path of the damper blades and then remove electrical power (or air pressure) from the actuator allowing the actuator to spring to the fully closed position.
3. Visually confirm that the damper has fully closed.
4. Reapply electrical power (or air pressure) to open the damper.
5. Visually confirm that the damper returns to the open position.

**MAINTENANCE**

Although regular physical inspections are not required by ICC or NFPA, the local authority having jurisdictions may require periodic maintenance. When maintenance is performed the following check list should be followed.

- Check actuator and tighten the linkage or coupling as necessary.
- Clean the damper blades and other working parts as necessary.
- Lubricate linkage, bearings, and other moveable parts with a silicone or graphite lubricant. **Do not use petroleum-based products as they could cause excessive dust buildup.**
- Cycle the damper/actuator following the instructions above.
- Consult Ruskin if problems are encountered.
PERIODIC PERFORMANCE TESTING FOR (D)IBD, (D)FD AND CFD DAMPERS

The recommended procedure for performing the periodic operational testing on fusible link operated dampers is described below.

- With the damper in the fully opened position, remove the fusible link. Care should be taken to ensure that there are no obstructions, including hands, in the path of the damper blades before the fusible link is removed.
- Once the fusible link is removed, ensure that the damper closes completely without assistance. If the damper is designed with a latch to hold in the fully closed position, confirm that the damper latches properly.
- Return the damper to the fully opened position and replace the fusible link. If the link appears damaged, replace with a functionally equivalent link.

MAINTENANCE

When maintenance is performed the following checklist should be followed.

- Check closure springs. If damaged or defective, repair or replace.
- Clean the damper blades and other working parts as necessary.
- Lubricate linkage, bearings, and other moveable parts with a silicone or graphite lubricant. **Do not use petroleum-based products as they could cause excessive dust buildup.**
- Cycle the damper/actuator following the instructions above.
- Consult Ruskin if problems are encountered.

**Note:**
Due to their construction (including size) and/or accessibility, dynamic curtain type fire dampers may be very difficult and in some cases impossible to test (close and re-open). If the damper is determined to be impossible to test, Ruskin recommends a thorough examination to ensure nothing exists which would prohibit the damper from closing. The examination should include the damper square-ness and blade channel is free of any obstructions.

**! Warning**
If the damper(s) have closure springs, caution needs to be taken to ensure injury does not occur.

**! Warning**
Ensure that the fan is off.

NFPA 80

- After damper installation is completed, an operational test shall be conducted.
- Each damper shall be tested and inspected 1 year after installation.
- In buildings not containing a hospital, each damper shall be tested and inspected every 4 years.
- In buildings containing a hospital, each damper shall be tested and inspected every 6 years.
- The test shall be conducted with normal HVAC airflow.
- All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.
- All documentation shall be maintained by the property owner and available for review by the AHJ.

NFPA 80

a. After damper installation is completed, an operational test shall be conducted.
b. Each damper shall be tested and inspected 1 year after installation.
c. In buildings not containing a hospital, each damper shall be tested and inspected every 4 years.
d. In buildings containing a hospital, each damper shall be tested and inspected every 6 years.
e. The test shall be conducted with normal HVAC airflow.
f. All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.
g. All documentation shall be maintained by the property owner and available for review by the AHJ.

NFPA 80

a. After damper installation is completed, an operational test shall be conducted.

! Warning
If the damper(s) have closure springs, caution needs to be taken to ensure injury does not occur.

! Warning
Ensure that the fan is off.
Purpose
Life safety dampers like fire dampers, smoke dampers, combination fire/smoke dampers, ceiling fire (radiation) dampers that perform as an integral part of a building’s fire protection strategy must function properly during a fire or life safety emergency. Proper installation, commissioning and periodic performance testing are required to ensure these dampers function as intended in a fire emergency.

Damper Types

- Curtain Fire Damper (D)IBD
- Multiple Blade Fire Damper (D)FD
- Smoke Damper (SD)
- Combination Fire Smoke Damper (FSD)

Ceiling Fire (Radiation) Damper: Install in accordance with the manufacturer's installation instructions in fire resistance-rated floor/ceiling or roof/ceiling assemblies.

Access: Dampers equipped with fusible links, internal operators, or both, shall be provided with an access door or provided with a removable duct section to provide access for inspection, maintenance and testing.

Operational Test: Each damper should be tested after installation. This test is performed to verify that the damper is installed properly and that there are no obstructions to interfere with the operation of the dampers.

Proper Commissioning

Commissioning: The term commissioning is used to define an inspection process to determine if all components of a building are operating as intended. Proper commissioning ensures that a building’s mechanical, HVAC, and smoke control systems operate properly (including all Fire and Life Safety Related Dampers). Documenting their proper operation is required as part of the commissioning process. Commissioning should be performed one year after installation and/or prior to the building being occupied. The commissioning process includes:

- Smoke and combination fire/smoke damper operational test after the building's HVAC system has been balanced
- Function and system verification of all indicating devices, such as end switches.
- Verification of smoke detection activation (when provided), the smoke detector shall be activated in accordance with the requirements of NFPA72.

Records: All inspections, operational tests and commissioning to be documented and maintained by the property owner and made available to the authorities having jurisdiction (AHJ) upon their request. The documentation shall indicate the following information:

- Location of the damper
- Date of inspection
- Name of inspector
- Deficiencies or discoveries (if any)
- Indicate when and how the deficiencies were corrected.

Proper Installation

Locations: All fire, smoke, combination fire/smoke, and ceiling fire (radiation) damper locations shall be shown on the drawings of the air duct systems.

Fire and Combination Fire/Smoke Damper Installation: Install per manufacturer's installation instructions by model. Common installation items include the following categories:

- Framing
- Opening
- Sleeve length and gauge
- Orientation
- Mounting Angles (one side or both sides)
- Duct/Sleeve Connections
**Damper Types:** These fall into one of the two following categories depending upon the operability:

1. **Dampers Requiring a Fusible Link to Operate**
Most fire dampers and ceiling fire (radiation) dampers, and some older generation combination fire/smoke dampers are held in an open position by a fusible link. The fusible link melts at a specified temperature, allowing gravity or a spring to close the damper. After the fusible link has melted, these dampers remain closed until reopened manually and a new fusible link is installed.

2. **Dampers That Do Not Require a Fusible Link to Operate**
Smoke dampers and most combination fire/smoke dampers do not use fusible links to operate. These dampers use an electric or pneumatic actuator to operate the damper. A bi-metallic disc type thermostat is used to interrupt electrical power or air pressure to the actuator at a specified temperature. Once the electrical power or air pressure is interrupted the spring return feature of the actuator closes the damper.

**Proper Periodic Performance Testing**
Fire Life Safety related dampers that are properly applied and installed, and that have the proven ability to function as intended through a building commissioning process, should require no specific on-going maintenance beyond the periodic testing described below to confirm functionality.

Although the required frequency of this periodic operation testing varies by local jurisdiction, most local requirements reference one of two national standards, either NFPA 80 or NFPA 105. NFPA 80 covers the requirements for fire dampers and NFPA 105 covers the requirements for smoke dampers. Both documents contain the following frequency requirements for periodic operation testing:

*Each damper shall be tested and inspected one year after installation. The test and inspection frequency shall then be every 4 years, except in hospitals, where the frequency shall be every 6 years.*

**Fusible Link Operated Dampers**

⚠️ **Attention:** Dampers may be spring loaded and could cause harm if caution is not taken.

The recommended procedure for performing the periodic operation testing on fusible link operated dampers.

1. For safety considerations, ensure that the fan is off.
2. Check closure springs. If damaged or defective, repair or replace.
3. With the damper in the fully opened position, remove the fusible link. Care should be taken to ensure that there are no obstructions, including hands, in the path of the damper blades before the fusible link is removed.
4. Once the fusible link is removed, ensure that the damper closes completely without assistance. If the damper is designed with a latch to hold in the fully closed position, confirm that the damper latches properly.
5. Return the damper to the fully opened position and replace the fusible link. If the link appears damaged, replace with a functionally equivalent link.
6. Clean the damper blades and other working parts as necessary.

**Non-Fusible Link Operated Dampers**

The recommended procedure for performing periodic operation testing on dampers that do not require a fusible link to operate is described below. Two procedures are described for dampers without position indication switches and dampers with position indication switches.

The first procedure describes how to test dampers without position indication switches. This requires full access to the damper/actuator and it is similar to fusible link operated dampers.

1. Visually confirm that the damper is in the full-open position.
2. Ensure that all obstructions, including hands, are out of the path of the damper blades and then remove electrical power or air pressure from the actuator to allow the actuator's spring return feature to close the damper.
3. Visually confirm that the damper closes completely.
4. Reapply electrical power or air pressure to reopen the damper.
5. Visually confirm that the damper is in the full-open position.
Wireless Remote Testing

Ruskin’s optional wireless damper Inspector™ utilizing wireless communication protocol by EnOcean®, is the ideal solution for mandatory testing of motorized life safety dampers per NFPA® and Building Code requirements. The Ruskin Wireless Inspector™ includes the RFDI (Radio Frequency Damper Interface) located at each damper with factory switch package and one RFSC (Radio Frequency Smart Communicator). The RFSC includes an LCD screen displaying RFDI serial numbers or tags and damper status after cycle testing. Performing the scan function will locate all dampers in range. A microprocessor in the RFSC stores all test results which can be downloaded using the factory provided USB cable and stored to your personal PC.

1. Use the signal from the damper's position indication device to ensure the damper is in the fully open position.
2. Remove electrical power (or air pressure) from the actuator, allowing the actuator to spring to the fail position.
3. Use the signal from the damper's position indication device as an inspection to ensure the damper reaches the fully closed position.
4. Reapply electrical power (or air pressure) to open the damper.
5. Use the signal from the damper's position indication device as an inspection method to ensure the damper reaches the fully opened position.

Damper Test Switches (DTS)

The Damper Test Switches (DTS) and (DTS-SD) are optional “momentary” push button test switches available on Ruskin smoke and combination fire/smoke dampers. The DTS gives maintenance personnel the ability to “cycle test” the damper by pushing and holding the button until the damper has cycled.

Master Control Panels (MCP)

Optional master control panels ship loose for field installation and come with a momentary push button (MCP4) or keyed switch (MCP2). Both include indicator lights and are for use with smoke and fire/smoke dampers. The lights are red, indicating a closed damper position, and green for open damper indication. Both solutions provide a remote mounted panel for testing, eliminating the need for access to the damper.
Network Testing
The Classic Inspector™ network continuously monitors and records the health and status of all motorized smoke and combination fire/smoke dampers. The Classic Inspector™ is also a damper testing system that is used to test each damper as scheduled automatically, without going to each damper and manually testing. The Classic Inspector™ includes a fire/smoke damper interface (FSDI), fire/smoke damper control panel (FSDPC), factory commissioning and testing to ensure every damper functions as intended prior to building turnover.

Fire/Smoke Damper Interface (FSDI) - FSDI provides the necessary interface to allow communications between the damper and the Ruskin Inspector™ FSDPC. Any life safety damper equipped with the FSDI is Ruskin Inspector™ ready. Up to 500 devices may be installed on a single panel.

Fire/Smoke Damper Control Panel (FSDPC) - is the heart of the Ruskin Inspector™ system. The FSDPC control panel is equipped with a Windows embedded operating system that is fully programmed and ready for commissioning. The touch screen monitor makes viewing the current health and status of each device simple. Navigate through each group of devices with an intuitive graphical user interface (GUI). Testing of all devices on the network is fully automated. The data log records all activity, providing necessary test report documentation for use of Authorities Having Jurisdiction (AHJ).

List of Publications Referenced in this Document
UL 555 Standard for Fire Dampers
UL 555S Standard for Smoke Dampers
UL 555C Standard for Ceiling Dampers
UL 263 Standard for Fire Tests of Building and Construction Materials
NFPA 80 Standard for Fire Doors and Other Opening Protectives
NFPA 105 Standard for the installation of Smoke Door Assemblies and Other Opening Protectives
NFPA 72 National Fire Alarm and Signaling Code
NFPA 92 Standard for Smoke Control Systems
The testing and maintenance of fire dampers is not a new idea. However, more and more Authorities Having Jurisdiction (AHJ’s) and building owners are requiring fire dampers to be operational tested and maintained on a regular basis. The reason for this requirement is a greater awareness of the life and property protection capabilities of the dampers.

AHJ’s are requiring operational test to determine if the damper will function when needed in order to resist the spread of fire. Operational testing normally involves removing or melting the fusible link and letting the damper close. Once the damper has proven to close, it is reopened and the fuse link replaced. All the dampers installed in a building must be tested prior to occupancy and again 1 year later under normal operating conditions. Reference NFPA 80 and NFPA 105

Operational test and regular maintenance presents a couple of problems.

1. Most fire dampers are installed in areas of the building that are not easily accessible. Fire dampers are installed in penetrations of fire walls and floors as required by the building codes and access to the damper itself is normally through a small access door.

2. Fire dampers can be extremely difficult to test and re-set due to their design (all manufacturers’ utilize the same basic curtain type design). There are two main types of fire dampers: dynamic fire dampers and static fire dampers. Dynamic fire dampers have been UL tested to close against system air pressure and velocity. Static fire dampers, on the other hand, are UL tested to prevent the passage of flame and not tested to close under system air pressure and velocity. The main difference between the two designs is dynamic dampers (in most cases) utilize springs to pull the curtain blades closed against the air pressure and velocity while static dampers rely solely upon gravity to pull the curtain blades closed (static dampers designed for floor installation utilize closure springs with enough force to only pull the curtain blades closed).

Dynamic fire dampers are becoming more popular with designers because dynamic damper may be used in either a static system (fans off) or dynamic system (fans on) and static damper can only be used with static systems (fans off).

Limited access and closure springs on dynamic curtain blade fire dampers and floor mounted static curtain blade fire dampers do not make testing and maintenance friendly. However, they are life and property friendly because they will close when properly applied and installed.

A solution to the operational acceptance testing problem is to know the testing requirements beforehand and coordinate with the AHJ.

A solution to the maintenance testing is not so simple.
Maintenance should be preformed per NFPA80 and NFPA 105 requirements “Each damper shall be tested and inspected after the damper is installed, then one year after installation. The maintenance testing and inspection frequency shall then be every 4 years, except in hospitals, where the frequency shall be every 6 years.”

Access to the dampers remains a problem; a motorized fire damper that can be operated from a remote, easy accessible, location and can be equipped with position indication for operation verification. A motorized fire damper can be more easily maintained compared to a standard dynamic fire damper and contributes to maintenance and insurance savings. All motorized fire dampers are dynamic rated and may be utilized in place of any static or dynamic curtain blade fire damper.

Another solution to access and maintenance on dynamic curtain blade fire dampers is the use of multiple blade dynamic fire dampers. Multiple blade fire dampers are easy to both test and re-set because the blades can be operated and held open via a hand lever or a pair of pliers while the fuse link is replaced.

Additional solution for round ducts is the use of a true round fire damper. Round fire damper allows the fusible link to be replaced easily and the damper can be adjusted back to it’s full open position.

**Summary**

Testing and maintenance of fire dampers, especially dynamic curtain blade fire dampers, can be extremely difficult. There are however, other types of dynamic fire dampers that make testing and maintenance easier. The benefits of these dampers are realized in areas like maintenance and insurance. Before designing around ‘standard’ curtain type dynamic fire dampers; check with the AHJ and owner to review the operational testing and maintenance requirements of the building being designed.
HVAC system designers are specifying more round duct today than ever before. The reasons for more round duct are:
1. Round duct performs better than square duct.
2. Round duct can be produced more economically than square duct.
3. Round duct is stronger than comparably sized square duct.

The same can be said for dampers. Round fire/smoke dampers have better pressure drop and airflow performance than their square or rectangular counterparts. Round fire/smoke dampers are built from less material and therefore cost less to produce. Once the designer has selected round duct, the overall installed cost of round dampers versus square dampers with transitions is greatly reduced. There are fewer pieces to handle. Sleeves are integral to the damper and retaining plates make round dampers installable in either square or round openings within fire rated walls and floors. Noise through a round damper is also significantly reduced because of the even airflow characteristics.

This engineering report compares round dampers to their square counterparts using indexed product costs and typical performance criteria.

**Round versus square advantages**
1. Installation time reduced
2. Fewer piece parts at job site
3. Lower product cost
4. Less noise generation
5. Less pressure drop
6. Factory shipped retaining plates
7. Integral sleeve

FIGURE 1

FIGURE 2

ERTRFSD-102/Replaces 294:1
Figure 1 depicts Ruskin's FSDR25 damper. The FSDR25 is designed and qualified specifically for point-of-origin fire containment and smoke control and meets code requirements for critical system performance. Figure 2 shows a square damper with a square-to-round transition mounted in a wall.

Comparison
Round dampers have significant performance advantages in terms of airflow and pressure drop when compared to square dampers with round transitions. Figure 3 compares the performance of the FSDR25 with an airfoil blade damper (FSD60) and a triple vee groove blade damper at arbitrary CFM’s. As you can see, the FSDR25 outperforms the two rectangular FSD dampers by an average of 40%!

In addition to the performance advantages, Figure 4 details a relative cost comparison between the FSDR25 and the FSD60 and FSD36. The FSDR25 and FSD60 are UL Class I and the FSD36 is Class II. The two examples indicate a weighted cost difference of 23% less for the FSDR25.

**PERFORMANCE COMPARISON**

**EXAMPLE #1**
- **FSD60** with 10" Round Transition
  @1000 CFM; DELTA P = .140*
- **FSD36** with 10" Round Transition
  @1000 CFM; DELTA P = .170*
- **10" FSDR25**
  @1000 CFM; DELTA P = .110

**EXAMPLE #2**
- **FSD60** with 18" Round Transition
  @4000 CFM; DELTA P = .078*
- **FSD36** with 18" Round Transition
  @4000 CFM; DELTA P = .120*
- **18" FSDR25**
  @4000 CFM; DELTA P = .045

*PRESSURE DROP INCLUDES LOSSES DUE TO RUSKIN TYPE "CR" TRANSITIONS IN SQUARE TO ROUND APPLICATIONS.

**FIGURE 3**

**RELATIVE COST COMPARISON**

**EXAMPLE #1**
- **FSD60** with 10" Round Transition, Conv. Angles and 17" Sleeve
  Price Index (W/ACT*) = 1.00
- **FSD36** with 10" Round Transition, Conv. Angles and 17" Sleeve
  Matching Price = .885
- **FSDR25** with 10" Retaining Plates and 17" Sleeve
  Matching Price = .782

**EXAMPLE #2**
- **FSD60** with 18" Round Transition, Conv. Angles and 17" Sleeve
  Price Index (W/ACT*) = 1.00
- **FSD36** with 18" Round Transition, Conv. Angles and 17" Sleeve
  Matching Price = .882
- **18" FSDR25** with Retaining Plates and 17" Sleeve
  Matching Price = .745

**FIGURE 4**
There are several pieces of information out there stating airfoil blades on dampers are unnecessary. To help your engineers make up their own minds as to the correct blade to specify, here are five reasons to specify an airfoil blade over a triple-V-groove or modified flat blade:

1. **BLADE STRENGTH**
2. **STATIC PRESSURE LOSS**
3. **SEALING ABILITY**
4. **FIRE PROTECTION ABILITY**
5. **NOISE PRODUCED**

Now, let's look at these five reasons in detail.

### 1. BLADE STRENGTH

The strength of a blade comes primarily from its shape. There are three basic blade shapes available in the market:

- **AIRFOIL**
- **TRIPLE-V-GROOVE**
- **MODIFIED SINGLE SKIN**

Single skin blades are difficult to keep flat and true when compared to a hollow, airfoil shaped blade like the Ruskin 60 blade. When side linkage is used to keep the linkage out of the airstream, a hollow blade does not twist from side to side. A single skin design will twist.

The following chart compares blade length and maximum static pressure. The maximum static pressure is based on 1/360 of the span deflection, which is required to maintain good leakage characteristics.
Your engineer may say he doesn’t need the high static pressure design. But if the dampers are designed to close rapidly – such are fire dampers with fusible links or bimetal links – the instantaneous static pressure will far exceed the design static pressure due to the mass of air flowing through the duct downstream of the damper at closure. The negative static pressure can collapse duct as shown in Figure 1.1 or destroy the damper as shown in Figure 1.2.

<table>
<thead>
<tr>
<th>Blade Length</th>
<th>Maximum Instantaneous Static Pressure – in. w.g.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 Blade Airfoil</td>
</tr>
<tr>
<td>36&quot;</td>
<td>17</td>
</tr>
<tr>
<td>32&quot;</td>
<td>25</td>
</tr>
<tr>
<td>30&quot;</td>
<td>30</td>
</tr>
</tbody>
</table>

*Instantaneous static pressures shown are not normal operational design static pressures, but sudden and momentary static pressures that may be encountered.
The negative static pressure can build as depicted in Figure 1.3, which is based on 4000 fpm duct velocity and only 21' downstream ductwork. As you can see, blade design is important in handling the static pressure that can build in your everyday HVAC system.

2. STATIC PRESSURE LOSS

The static pressure drop on a 60 airfoil blade is less than single skin type blades. Figure 2.1 shows static pressure vs. airflow comparison for 24" x 24" dampers. Testing was performed to AMCA Standard 500.

Because many systems have multiple dampers in series, static pressure drop becomes important when velocity is above 1500 fpm.
3. **SEALING ABILITY**

The 60 hollow shape, airfoil blade does not twist when force is exerted from one edge. Single skin blades depend on offsets or bends in the blade to make it strong; these bends do not give support to the blade in a twisting action. Try twisting a piece of paper and see how one edge bends and the other edge does not. A hollow shape blade moves throughout its length when twisted on one end, giving excellent blade-to-blade sealing action.

4. **FIRE PROTECTION ABILITY**

The hollow airfoil blade of the 60 has proven to withstand the most rigorous fire endurance testing. The hollow double skin airfoil blade shape actually provided heat resistance not found in a single skin blade design. Figure 4.1 shows a four hour British Fire Test of the FSD60 and FSD35. The temperature on the exposed side of the FSD60 was 212°F cooler throughout the fire test due to the insulating effect of the hollow blade. The British Fire Test shown was performed under positive pressure which gives a much hotter test than an Underwriters Laboratories fire testing.

![Figure 4.1](image)

5. **NOISE PRODUCED**

The airfoil blade produces less turbulence to the airstream than a triple-v-groove or modified single skin blade. The following chart shows the noise produced by all three blade shapes at various velocities flowing through the damper.

<table>
<thead>
<tr>
<th>Velocity</th>
<th>Airfoil</th>
<th>Triple-V-Groove</th>
<th>Prefco Single Skin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 FPM</td>
<td>19 NC</td>
<td>30 NC</td>
<td>29 NC</td>
</tr>
<tr>
<td>2000 FPM</td>
<td>35 NC</td>
<td>46 NC</td>
<td>46 NC</td>
</tr>
<tr>
<td>3000 FPM</td>
<td>45 NC</td>
<td>55 NC</td>
<td>58 NC</td>
</tr>
<tr>
<td>4000 FPM</td>
<td>51 NC</td>
<td>60 NC</td>
<td>63 NC</td>
</tr>
</tbody>
</table>

1. NC based on noise generated in third octave band with 10 db room attenuation.
2. Test conducted in accordance with ASTM Standard E477-80.
Combination Fire/Smoke dampers are part of a larger category of products known as life safety products. They are tested in accordance with the stringent requirements of Underwriters Laboratory (U.L.) Standards for Safety UL555 and UL555S. Fire/smoke dampers must be dependable and quick acting to save life and property.

U.L. testing requires release devices of fire/smoke dampers to sense heat and operate within a one minute time frame. Testing of fusible rod and fusible link devices (used on most fire/smoke dampers) have shown they, typically, barely meet the one minute criteria.

Ruskin provides additional insurance with fast acting heat detection for fire smoke/dampers. The Ruskin Electronic Fuse Link (EFL) and Pneumatic Fuse Link (PFL) detect heat in 1/3 to 1/2 the time of standard fuse rods or fuse links. Quicker detection simply means increased safety and property protection in fire conditions.

The EFL and PFL serve a two-fold purpose. First, they prevent possible duct damage. This is accomplished by closing and locking the damper via the actuator and its accompanying spring (the EFL/PFL also incorporate a normally closed fail safe feature). A fusible link or fuse rod lets the damper close too fast when it releases (instantaneously) which has the potential for costly duct disruption or collapse. The EFL and PFL are controlled closure devices which allow the damper to close in 3 to 10 seconds rather than instantaneously. For additional information on this subject, see Engineering Report No. 795:1 (Controlled Closure Fire/Smoke Damper Design Eliminates HVAC Duct System Damage.) Second, the EFL and PFL are designed to detect heat faster. This means they act much quicker than fusible links or fuse rods which have extra mass that must melt away prior to activation.

The EFL and PFL were tested like other release devices. Sample damper assemblies were placed in an opening in a concrete slab and installed per Ruskin’s installation instructions. The concrete slab was placed over a horizontal furnace and power was applied to the damper operator. The damper cycled to the open position, and the assembly was subjected to the fire endurance test. This verified the damper would close within one minute and stay closed for 1 1/2 hours or 3 hours as described in Standard UL555.

Testing was completed with a "worse-case" scenario by having the operator and heat actuated device on the non-exposed side of the furnace. U.L. tested the EFL and PFL with the 285°F option (when a 285°F primary
release device is qualified, the next lower temperature device is automatically qualified). It took only 1/2 the time after furnace ignition for the EFL 285°F to close the damper (vs. a fuse rod or link). The PFL 285°F required only **13 seconds** after furnace ignition to close the damper. Such a big improvement provides additional insurance against loss of life and property.

Ruskin has a whole line of quick release devices. In addition to the EFL and PFL there is the TS150EZ. The TS150EZ is the "reopenable Firestat" option and is designed for dynamic smoke management systems. All these devices offer controlled closure while being quick detecting. They also allow the damper to be reset from outside the duct. The EFL is **standard** on all fire smoke dampers with electric actuators. The PFL is **standard** on all fire smoke dampers with pneumatic actuators. If remote blade position indication is needed, Ruskin can provide an SP100 switch. When a pneumatic actuator is ordered with a non-standard EFL or TS150EZ an EP switch is required to interface between the two.

To summarize: Ruskin developed these quick detecting, controlled closure devices to improve life safety and to better protect property and ductwork. Quicker heat response time prevents the spread of flame and smoke through the ductwork while eliminating damage that can be caused by instantaneous closure.

Contact your local Ruskin representative for more information on these or any other Ruskin fire smoke damper advantage.

---

**SUGGESTED SPECIFICATION**

Each combination fire/smoke damper shall be equipped with a quick detect heat-actuated temperature release device to prevent duct and HVAC component damage. Instantaneous damper closure is unacceptable.

All fire/smoke dampers equipped with a UL approved electric actuator shall have an EFL or PFL when pneumatic actuators are provided. The EFL/PFL shall release in half the time of a fuse rod or link at temperatures of 165°F (74°C), 212°F (100°C) or 285°F (141°C).

Upon detection, the EFL/PFL shall close and lock the damper during test, smoke detection, power failure, or fire conditions through actuator closure spring. At no time shall the actuator disengage from damper blades.

The EFL/PFL shall allow the damper to be automatically and remotely resettable after test, smoke detection, or power failure conditions.
Testing and Maintenance Options

Classic Damper Inspector System
Wireless Damper Inspector
Damper Test Switch ‘DTS’ (Combination Fire Smoke Dampers)
Damper Test Switch Smoke Dampers ‘DTS-SD’
Master Control Panel (Lights Only) ‘MCP3’
Master Control Panel (Test Switch and Lights) ‘MCP4’
Master Control Panel (Push Test Button or On-Off) ‘MCPB’ or ‘MCP1.5’
Master Control Panel (Used with the TS-150 Fire Stat) ‘MCP1’ or ‘MCP2’ (keyed Switch)
Master Control Panel (Used with the TS-150 Fire Stat) ‘MCP10’ or ‘MCP20’ for up to 20 dampers
CLASSIC DAMPER INSPECTOR™
Net Work Installation and Commissioning Guide

APPLICATION

The Ruskin Inspector™ represents a new generation fire/smoke damper system. It has been designed with the user in mind, providing an advanced tool that simplifies installation and commissioning of fire/smoke dampers. The Panel PC operates on an embedded platform and utilizes solid state technology for optimum reliability. Its server architecture delivers new benefits such as reduced commissioning time and simplified operation for continuous monitoring and automated testing of fire/smoke dampers.

<table>
<thead>
<tr>
<th>PANEL SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZES (H x W x D)</td>
</tr>
<tr>
<td>(Image Shown)</td>
</tr>
<tr>
<td>COLOR</td>
</tr>
<tr>
<td>HINGED</td>
</tr>
<tr>
<td>POWER CABLE</td>
</tr>
<tr>
<td>I/O CABLE</td>
</tr>
<tr>
<td>INTERNAL PC CABLE</td>
</tr>
<tr>
<td>FIELD NETWORK CABLE</td>
</tr>
<tr>
<td>MAX ROOM AMBIENT TEMPERATURE</td>
</tr>
</tbody>
</table>

PANEL FEATURES

- Keyed security lock
- Hinged door
- Cable numbering (determined at order)
- Removable gland plate

NOTES

- Panel must be in a ventilated environment
- Use supplied fuses only
- National Electric Code (NEC)
- White-Neutral / Black-Hot
- Use specified network cables only (see page 2)
WARNING: The Ruskin Inspector™ system is a life safety damper monitoring & test solution requiring specific network cables that are fundamental to the stable and reliable operation of the network. There are no alternatives or equivalents acceptable. Use of alternate cables will void all warranties and such cables will have to be replaced to allow stable and reliable operation.

Network Rules: NO ‘EQUIVALENTS’ NO ‘ALTERNATIVES’

1. All devices to be wired in a “daisy chain” fashion as shown in the illustration above.
2. Standard network rules apply i.e. network cables must NOT be run alongside any high voltage and/or high frequency sources. If FSDI’s are wired in areas of high voltage such as plant rooms/elevator lobbies, network cable must be installed in dedicated conduit.
3. Network cable types must NOT be mixed on a cable segment.
4. Maximum TOTAL wire length for cable segment must not exceed 1650 feet.
5. If greater than 60 dampers and/or cable segment length of greater than 1650 feet, a network extender must be utilized.
6. Damper interfaces must be wired on a dedicated power supply.
### Electrical Contractor responsibilities:
(Refer to FSDI Datasheet and Installation Instructions)

A. Check to ensure FSDI enclosure has been properly installed and wired into the Inspector Ready™ junction box located on the damper. Consult installation instructions for details.

B. Provide correct voltage to each FSDI enclosure/FS Damper.

C. If 24V, AC or DC is acceptable. Be mindful of voltage drop over distance.

D. Furnish and install, or coordinate the installation of, all FSDI network cable(s) in accordance with local and national codes and standards. Terminate to inside of FSDI enclosure via glands. Outer cable sheaths to be stripped to approx. 1 Inch only, to ensure glands seal on cable sheath.

E. Terminate the network cable end(s) at each FSDI and the FSDPC Inspector™ Panel PC.

F. Power supply and all interconnecting wiring between, BMS and any other systems integrated with the Inspector™ system to be terminated by the electrical contractor, or trade as defined by specifying engineer.

G. Mounting of FSDPC Inspector™ Panel PC shall be the responsibility of the electrical contractor.

H. Furnish drawings of “as wired” cable route(s) to Ruskin authorized commissioning agent and coordinate commissioning event with Mechanical contractor of record.

**Note:**
1. If plans indicate a remote mounted FSDI enclosure location (exceeding 36” from the damper), additional material and labor will be required. Furnish and install rigid conduit and necessary wiring between the remote mounted FSDI Enclosure and the Inspector Ready™ junction box located on the damper. Refer to installation instructions for additional details.

### Mechanical Contractor responsibilities:
(Refer to FSDI Datasheet and Installation Instructions)

A. Install or coordinate the installation of all dampers in accordance with Ruskin installation instructions, local building codes and standards. Consult with the local authority having jurisdiction to resolve any discrepancies.

B. Install or coordinate the installation of all FSDI enclosures. FSDI enclosures shall be installed within 36” of the damper actuator. Terminate factory installed wires in the Inspector Ready™ junction box located on the damper. Refer to installation instructions for additional information. Install FSDI enclosures, using pre-drilled mounting holes only. Standard FSDI enclosures are for indoor use only. If plans and specification require a remote FSDI enclosure mounting, coordinate the additional wiring with the Electrical Contractor in accordance with note 1 under electrical contractor responsibilities.

C. Install code required duct access door at each life safety damper location, as defined by the International Building Code (IBC) and National Fire Protection Agency (NFPA). Ruskin requires head and shoulder access to the FSDI Inspector Ready™ logic card enclosure.

D. Furnish a full set of ‘As Built’ drawings prior to scheduling the commissioning activities.

E. Coordinate the commissioning event with Ruskin authorized commissioning agent.

**Note:**
1. Dampers are designed for applications in normal dry filtered air systems, not for outdoor use. If external use is required please contact Ruskin.

### Prior to Commissioning

A pre commissioning checklist will be issued for completion prior to the site visit for commissioning. Ruskin requires three weeks notice, completed checklist and a complete set of latest revision drawings before the site visit and subsequent commissioning.

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**Commissioning**

Ruskin’s role in the installation and integration of the Inspector™ system is to commission only. Our commissioning activities, which must be at the earliest opportunity by the site engineer, will commence on completion of the mechanical & electrical installation work if the following conditions are met:

1. Full site access is available and the site meets all current Health and Safety requirements.
2. The dampers and ductwork have been correctly installed to the applicable standards including access to dampers and actuators.
3. The damper actuators and the FSDI’s are fully & safely accessible.
4. The network & power supply cable(s) have been correctly installed in accordance with all local and national codes and standards.
5. Permanent electrical power is available for testing / setting up procedures.

**Please note:** Aborted visits will be charged if misleading information has been provided.

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**CONTRACTORS INSTALLATION / COMMISSIONING GUIDE**

**Our Commissioning Activities consist of:**

1. Installation of FSDI circuit board within the previously mounted FSDI enclosure.
2. Operate and prove each damper within the Ruskin Inspector™ network.
3. Program Inspector™ FSDPC panel pc to ensure every damper is in communication and is operational.
4. Create back up of system configuration
5. Turn network over to building maintenance personnel and provide necessary operational training.

**Handover:**

Upon completion of commissioning, The Ruskin authorized commissioning agent will fully demonstrate all functions of the system to the client’s representative and instruct them at the user level. We will also prove the environmental strategy, if required.

**Certification**

The Ruskin Inspector™ network & Ruskin fire/smoke dampers conform to all current relevant standards an upon completion a commissioning, a certificate of code required testing and conformance will be issued

**Documentation:**

Together with the commissioning certificate we will also issue the following documentation

- Overview
- User guide
- Panel drawings
APPLICATION

Ruskin's wireless damper system, utilizing wireless communication protocol by EnOcean®, is the ideal solution for mandatory testing of motorized life safety dampers per NFPA* and Building Code requirements. The Ruskin Wireless Inspector™ includes the RFDI (Radio Frequency Damper Interface) located at each damper with factory switch package and one RFSC (Radio Frequency Smart Communicator). The RFSC includes an LCD screen displaying RFDI serial numbers or tags and damper status after cycle testing. Performing the scan function will locate all dampers in range. A microprocessor in the RFSC stores all test results which can be downloaded using the factory provided USB cable and stored to your personal PC.

*Reference NFPA 72, 80, 90A, 92B and 105.

STANDARD CONSTRUCTION

ENCLOSURE
5" x 7" x 21/2" (127 x 178 x 63)
18 gage (1) galvanized steel
NEMA 1

CIRCUIT BOARD
Integrated transformer 120V primary 16V secondary
Onboard LED diagnostics (damper position and relay contact)
Manual test push button
EnOcean communication protocol

HUMIDITY
99%, non-condensing

TEMPERATURE RANGE
0°F to 130°F

POWER REQUIREMENTS
115V 50/60 Hz

AGENCY LISTINGS
FCC ID: SZV-STM300C
IC: 5713A-STM300C

RADIO FREQUENCY
315Mhz for USA Applications

FEATURES

• Wireless communication
• Satisfies NFPA 72, 80, 90 and 105 testing requirements
• 42” (1067) long wire harnesses factory terminated at circuit board
• RFDI with onboard LED diagnostics
• Integrated manual test button at each damper location
• USB cable for programming and downloading

VARIATIONS

Ruskin model RFDI is available with the following variations at additional cost.
• Factory programming of RFSC (damper tag/ID)
• 868.3Mhz radio frequency (Europe and Asia)

The cycling of actuators for fire/smoke and smoke dampers is a common practice and can be accomplished in a variety of ways. The easiest and most economical process is with Ruskin’s patented Damper Inspector™ system. Available in both wired and wireless versions, our Damper Inspector products save time and money ensuring that your life safety products protect the building structure and save lives. USA Patent 7241218 – Fire/Smoke Damper Control System. Other patents pending.
1. RFDI enclosure base
2. Circuit board snap track
3. Circuit board with transformer and RF engine
4. Antenna shield
5. Installation instructions
6. RFDI enclosure cover
7. Enclosure cover fasteners

RFDI DIMENSIONAL DETAILS

Ruskin furnished and mounted 42" (1067mm) long factory actuator wire harness in flexible conduit terminated at circuit board.

Ruskin furnished and mounted 42" (1067) long factory wire harness in flexible conduit terminated at circuit board.

RFDI ELECTRICAL DATA

DAMPER CLOSE
DAMPER OPEN

Local Power (field wired)

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RFSC DETAILS (CAN BE ORDERED SEPARATELY OR AS PART OF COMPLETE WIRELESS INSPECTOR™ SYSTEM)

RFSC – Radio Frequency Smart Communicator – is designed to work exclusively with the Ruskin RFDI – Radio Frequency Damper Interface. The hand-held RFSC is equipped with EnOcean® open protocol software, permitting the building maintenance personnel to scan each onboard transceiver to locate and cycle test each damper.

NOTES:
A. RFSC radio frequency smart communicator
B. Plastic, foam-lined protective carrying case
C. Wrist strap
D. USB cable compartment (cable furnished)
E. Battery compartment (batteries furnished)
NOTES:
1. –––– denotes field wired.
2. RFDI enclosure ships loose. Terminate factory wires in 4 x 4 box, as shown, in field.
3. 24V actuators use red, black, green/gnd.

SUGGESTED SPECIFICATION

Furnish and install at locations shown on the plans or as described in schedules, a radio frequency wireless damper test system for motorized life safety dampers including combination fire/smoke or smoke dampers as indicated.

In accordance with NFPA and IBC requirements, a completed test of each damper shall be accomplished and recorded prior to turning the building over. The wireless system shall include a transceiver located at each life safety damper that communicates to the transceiver located in the hand-held smart controller. The radio frequency damper interface (RFDI), located at each damper, shall be housed in an 18ga galvanized electrical enclosure with standard knockouts for power wire termination. The RFDI shall be suitable to receive 120VAC (24VAC optional) and shall bear FCC and IC listings on the outside of the enclosure. All circuit boards shall be RoHS compliant. Local power and termination at each damper shall be completed by the electrical contractor of record. The RFDI shall have onboard LED diagnostics to aid in damper setup without penetrating the duct. LED Lights shall indicate open or closed damper status, smoke alarm contact, power to circuit board and relay contact. A manual test button at each RFDI shall also be furnished for local testing. The RFDI assembly, including wire harnesses and termination to the circuit board, shall be accomplished by the manufacturer in an ISO9001 certified facility.

To complete the wireless communication system, each project shall include at least one radio frequency smart communicator (RFSC). The address of each RFDI shall be programmed into the RFSC at the factory utilizing EnOcean® communication protocol. The hand-held RFSC shall facilitate remote testing and inspection of the all actuated life safety dampers. Each damper address and confirmation of the damper’s operation shall be displayed on an LCD screen. The RFSC shall be re-programmable and re-addressable at the building job site. The operating range of the radio transceivers shall be at least 90 feet. User-defined dampers shall have the ability to be locked out and password protected. The RFSC shall have the ability to connect to a personal computer via USB for downloading test results and upgrading software. Manufacturer shall provide all necessary software.

The life safety testing and reporting system shall be in all respects equivalent to Ruskin Wireless Damper Inspector™.
The Damper Test Switch (DTS) is an optional “momentary” push button test switch available on Ruskin fire/smoke dampers. The DTS gives maintenance personnel the ability to “cycle test” the fire/smoke damper by pushing and holding the button until the damper has cycled. When ordered, as an option, the DTS will be combined with the EFL, in a common enclosure, as shown below. If the fire/smoke damper is ordered with an SP100 switch package, the DTS will be combined with the EFL and SP100 in a common enclosure as shown below.

**WIRING DIAGRAMS**

**DTS/EFL**

**DTS/EFL/SP100**

**NOTE:** Dimensions shown in parentheses ( ) indicate millimeters.

Spec DTS-107/Nov

ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION.

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Click to Return to: INDEX FSD SD IBD/DFD CFD
APPLICATION

The Damper Test Switch for Smoke Dampers (DTS-SD) is an optional “momentary” push button test switch available on Ruskin smoke dampers. The DTS-SD gives maintenance personnel the ability to “cycle test” the smoke damper by pushing and holding the button until the damper cycles to its de-energized position. The DTS-SD may be supplied factory mounted and wired to the dampers actuators or shipped loose for field wiring.

**WIRING DIAGRAM**

BLK or RED

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smoke Damper</td>
</tr>
<tr>
<td>2</td>
<td>Side Plate or Sleeve</td>
</tr>
<tr>
<td>3</td>
<td>Actuator</td>
</tr>
<tr>
<td>4</td>
<td>Conduit</td>
</tr>
<tr>
<td>5</td>
<td>DTS-SD</td>
</tr>
</tbody>
</table>

Pneumatic actuators to be piped per local codes. Electric actuators to be wired per the National Electric Code (NEC) and local codes. See actuator for wiring diagrams.
APPLICATION

The MCP3/34 is a ship loose single control panel with lights only for use with fire, smoke and fire/smoke dampers. The lights are a "replaceable" red light for closed damper and a "replaceable" green light for open damper. The MCP3 is for use in 120VAC systems while the MCP34 is for use in 24VAC systems.

S1 - Damper Position Indication Switch, closed when damper is closed.
S2 - Damper Position Indication Switch, closed when damper is open.
APPLICATION

The MCP4/44 is a ship loose single control panel with a momentary push button switch and lights for use with smoke and fire/smoke dampers. The lights are a “replaceable” red light for closed damper and a “replaceable” green light for open damper. The lights make the MCP4/44 available for remote mounting. The MCP4 is for use in 120VAC systems while the MCP44 is for use in 24VAC systems.

M - Electric Actuator or EP Switch
TS1 - Primary Temp. Sensor
S1 - Damper Position Indication Switch, closed when damper is closed.
S2 - Damper Position Indication Switch, closed when damper is open.

![Diagram of MCP4/44 control panel]

```
MCP-4/44
120 VAC or 24 VAC FUSED CIRCUIT

L1 (HOT)  BRN  BLK
CONTROL PANEL
CLOSED
RED LIGHT OPEN
GREEN LIGHT

SMOKE DETECTOR (IF USED)
BRN  TS1

ELFISP-100 WIRING COMPARTMENT

L2 (NEUTRAL)
```
MCPB AND MCP1.5 TEST SWITCHES

APPLICATION

The MCPB is a momentary push button test switch and the MCP1.5 is a toggle type "on/off" test switch. They are available as options to Ruskin fire/smoke dampers and smoke dampers. The MCPB and MCP1.5 enable easy maintenance by allowing the dampers to be tested and cycled by simply moving the toggle switch or holding the push button down. One MCPB or MCP1.5 is required per closure device.
MCP1, MCP14, MCP2 AND MCP24 CONTROL PANELS

APPLICATION
The MCP1/14 and MCP2/24 are ship loose single control panels for use with in dynamic smoke management systems on fire/smoke dampers equipped with the TS150. The MCP1/14 utilizes a toggle type switch and the MCP2/24 utilizes a "removable" key type switch. These control panels also have a "replaceable" red light for closed damper and a "replaceable" green light for open damper. The MCP1 and 2 are for use in 120VAC systems while the MCP14 and 24 are for use in 24VAC systems.

The toggle switch and key switch are 3 position switches with the following options:
NORMAL – The fire/smoke damper remains open until closed by elevated temperatures.
CLOSED – The fire/smoke damper closes and remains closed regardless of any sensor signal.
OPEN – The fire/smoke damper opens and remains open until any temperature sensor signals the damper to close.

M - Electric Actuator or EP Switch
TS1 - Primary Temp. Sensor
TS2 - High Limit Temp. Sensor
S1 - Damper Position Indication Switch, closed when damper is closed.
S2 - Damper Position Indication Switch, closed when damper is open.
SD - Smoke Detector (optional, by others)
APPLICATION

These master control panels are for use in dynamic smoke management systems containing combination fire smoke dampers equipped with the Ruskin TS-150 FireStat.

FEATURES

The MCP10 with ten control stations and the MCP20 with 20 control stations offer completely enclosed lights, switches and wiring terminals located within and protected by a hinged, lockable cover with viewing windows. Damper position indicator lights are replaceable and are red for a closed damper and green for an open damper. MCP10 and MCP20 are for 120 VAC applications while the MCP104 and 204 are for 24 VAC applications.

The switcher used on the MCP10/104 and MCP20/204 are three position with the following options:

NORMAL position – The damper functions as a fire damper by remaining open until closed by elevated temperatures. The damper may also be closed by smoke detector signal, fan interlock contact, etc.

CLOSED position – The damper closes and remains closed regardless of any sensor signal.

OPEN position – The damper opens and remains open until any optional sensor signals the damper to close and lock.

M - Electric Actuator or EP Switch
TS1 - Primary Temp. Sensor
TS2 - High Limit Temp. Sensor
S1 - Damper Position Indication Switch, closed when damper is closed.
S2 - Damper Position Indication Switch, closed when damper is open.
SD - Smoke Detector (optional, by others)
CONTROL PANEL LAYOUT
FOR MCP10 AND MCP20

TERMINAL NO.  1  2  3  4  5  6  7  8  9  10
BLUE  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ RED LIGHT
YELLOW ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ GREEN LIGHT
BLACK ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ TOGGLE SWITCH
WHITE  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
BROWN  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ TYPICAL WIRING EACH CHANNEL

TERMINAL NO.  11  12  13  14  15  16  17  18  19  20
BLUE  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ RED LIGHT
YELLOW ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ GREEN LIGHT
BLACK ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ TOGGLE SWITCH
WHITE  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
BROWN  ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ TYPICAL WIRING EACH CHANNEL

TERMINAL PANEL LAYOUT
FOR MCP10 AND MCP20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
BLUE WIRE BLOCK
YELLOW WIRE BLOCK
WHITE WIRE BLOCK
BLACK WIRE BLOCK
BROWN WIRE BLOCK

RED LIGHT CIRCUITS
GREEN LIGHT CIRCUITS
TOGGLE SWITCH & LIGHT CIRCUITS (COMMON PER CHANNEL)
EMERGENCY OPEN CIRCUITS
NORMAL OPERATION CIRCUITS

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
Combination Fire/Smoke dampers are low leak damper and actuator assemblies that have passed the UL555 and UL555S test requirements for both a dynamic fire damper and a smoke damper. They are used in HVAC systems where both a fire damper and smoke damper are required at the same location.

**Fire/Smoke Damper Selection**

The process of selecting a fire/smoke damper involves the following considerations:

1. **Fire Resistance Rating** – 1-1/2 or 3 hours based on code requirements and building design.
2. **Leakage Rating** – Classes I, II & III (IBC requires minimum Class II).
3. **Elevated Temperature Rating** – 250°F or 350°F
4. **Operational Ratings** – Minimum 2000 fpm @ 4 in. w.g. or higher.
5. **Blade Design** – Airfoil, triple v-groove and low-profile aerodynamic design.

**Fire Resistance Rating**

Fire/smoke dampers are typically rated for 1-1/2 or 3 hours fire resistance. A 1-1/2 hour rated damper is sufficient for walls or floors having a rating of less than 3 hours. If the wall or floor has a rating of 3 hours or more, a 3 hour rated damper is required for sufficient protection. (IBC Chapter 7 and NFPA90A Chapter 5).

**Leakage Rating**

UL Standard 555S identifies three leakage classes as follows:

<table>
<thead>
<tr>
<th>Leakage Class</th>
<th>@4&quot; w.g.</th>
<th>@8&quot; w.g.</th>
<th>@12&quot; w.g.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>8</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Class II</td>
<td>20</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>Class III</td>
<td>80</td>
<td>112</td>
<td>140</td>
</tr>
</tbody>
</table>

IBC Chapter 7

*HVAC system designers are advised to select the lowest leakage class damper. However, there are some smoke control applications when a higher leakage class damper is acceptable.*

**Elevated Temperature and Operational Rating**

Under ambient airflow temperature the damper is cycled (open/closed) three times @ 4" w.g., then returned to full-open position where heat is introduced at an average temperature rise of 30° to 50°F (17° to 28°C) per minute until the specified elevated temperature of 250°F (121°C) is attained. The system shall maintain the elevated temperature of up to a maximum 50°F (28°C) above specified elevated temperature for a minimum of 15 minutes. At that time damper is to be fully closed and then fully opened using the actuator. Cycle times shall not exceed 75 seconds for both opening and closing. Minimum operational rating is 2000 fpm @ 4" w.g. and 250°F. Other higher ratings that may be desired are conducted in increments of 1000 fpm and/or increments of 2" w.g., and up to 350°F.

**Blade Design**

The most common damper blade shapes are triple v-groove and airfoil. Triple v-groove blades are used in HVAC systems with velocities less than 2,000 fpm. Airfoil blades may be used in all HVAC systems and should be utilized in systems greater than 2000 fpm.

**Fire/Smoke Damper Installation**

Fire/smoke dampers must be installed so the leading edge of the closed blades are within the barrier it is intended to protect (unless specifically designed for out of wall or floor applications). Refer to the UL approved installation instructions for specific requirements.
## COMBINATION FIRE/SMOKE DAMPER MODELS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>HOURLY RATING</th>
<th>LEAKAGE CLASS</th>
<th>BLADE TYPE/DESCRIPTION</th>
<th>MAXIMUM VELOCITY* (FPM)</th>
<th>MAXIMUM PRESSURE* (IN. W.G.)</th>
<th>MAXIMUM ASSEMBLY TEMP. (°F)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60LP</td>
<td>1-1/2</td>
<td>I</td>
<td>Aerodynamic</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>FSD60LP-2</td>
<td>1-1/2</td>
<td>II</td>
<td>Aerodynamic</td>
<td>2000</td>
<td>4</td>
<td>350</td>
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<tr>
<td>FSD60</td>
<td>1-1/2</td>
<td>I</td>
<td>Airfoil</td>
<td>4000</td>
<td>8</td>
<td>350</td>
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<tr>
<td>FSD60-2</td>
<td>1-1/2</td>
<td>II</td>
<td>Airfoil</td>
<td>4000</td>
<td>8</td>
<td>350</td>
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Ruskin FSD60LP, FSD60LP-2, FSD37LP and FSD36LP ultra low leakage, low profile and low pressure drop combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSDLP series is provided with an integral sleeve/frame design to obtain the pressure drop of less than .03 at 1000 FPM (5.1 m/s). All FSD60 series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

**FEATURES**
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Combination fire smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

**OPTIONS**
- **FM Approvals** as Specification Tested Product.
- **DTS** (Damper Test Switch) test switch for cycle testing.
- **TS150** for reopenable operation in dynamic smoke management systems.
- **SP100** Switch Package to allow remote indication of damper blade position.
- **MCP** Control panels for testing or monitoring purpose or smoke management systems.
- **Factory Sleeves** of various lengths and gages to ensure field compliance with UL installation requirements.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

---

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>blades</th>
<th>bearings</th>
<th>Jamb Seal</th>
<th>blade Seal</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
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<td>and frame 20 gage (1.0) galvanized, single piece</td>
<td>Low profile, aerodynamic shaped, double skin of 16 (1.6) and 20 (1.00) gage galvanized steel.</td>
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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

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<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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<td>36&quot;w x 14&quot;h (914 x 356)</td>
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* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
INSTALLATION INSTRUCTIONS
FSD36LP, FSD37LP, FSD60LP and FSD60LP-2
COMBINATION FIRE AND SMOKE DAMPERS
11/2 HOUR UL555 RATED UL555S LEAKAGE CLASS 1 AND 2

APPLICATION
The FSD60LP and FSD60LP-2 are low pressure drop, low profile combination fire smoke dampers designed to restrict the passage of flame and resist the passage of smoke. The FSD60LP and FSD60LP-2 standard installation is with the blade running horizontally and the centerline of the closed blade to be within the wall, partitions or masonry floors with ratings of less than 3 hours. For other types of installation like out of wall or floor (OW), grille access (GA) and front access (FA) installations refer to the GA OW version of the FSD60 and FSD60-2.

FSD36LP, FSD37LP, FSD60LP, FSD60LP-2 MAXIMUM UL CLASSIFIED SIZES
Parallel Blades – Single section vertical and horizontal – 36" x 14" (914 x 356).

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 Damper
• 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.
3235-0245:0129
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 1/4" 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 16 gage (1.6) mounting angle is utilized.

2. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. 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.

3. Damper Orientation
Damper is designed to operate with blades running horizontally and must be installed with leading edge of closed blades 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.

4. Mounting Angles
Mounting angles shall be a minimum of 11/2" x 11/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud and concrete/masonry wall and concrete/masonry floors, mounting angles are only required on one side of the wall or top side of the floor and must be attached to both the damper/sleeve and the wall or floor. Mounting angles may be installed directly to the metal floor and must be attached to both the damper/sleeve and the wall. 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 Maximum of 1/2” long (13), 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 11/2" (38). For two angle installations the fasteners shall be spaced at 8" (203) o.c.

5. Duct/Sleeve Connections
a. Break-away Duct/Sleeve Connections
   Rectangular ducts must use one or more of the connections depicted below:
   - PLAIN "S" SLIP
   - HEMMED "S" SLIP
   - DOUBLE "S" SLIP
   - INSIDE SLIP JOINT
   - STANDING S
   - STANDING S (ANGLE REINFORCED)
   - STANDING S (ALT)
   - STANDING S (BAR REINFORCED)
   - STANDING S (ANGLE REINFORCED)
   - DRIVE SLIP JOINT

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 Polymeric – 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.

6. Actuator Connections
   Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

7. Installation and Maintenance
   To ensure optimum operation and performance; the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Do not lift damper using blades or actuators. Each fire/smoke damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions or NFPA 80, 90A, 92A, 92B, 105 and UL964, local codes and in accordance with actuator manufacturer recommendations. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
Damper may be installed with actuator on either side of the partition.

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 SP-100.
3. Damper
4. Auxiliary Operating Jackshaft
5. Over-Center Link

ITEM DESCRIPTION
6. Mounting Angles (FAST, PFMA or Conventional)
7. Mounting Angle Fasteners
   (Fasteners in the damper must be 1/2" (13) long or shorter).
8 Duct/sleeve connection.

HORIZONTAL INSTALLATION
Damper may be installed with actuator above or below floor.

UNITS WITH ANGLE ONE SIDE IN A PARTITION WALL
Angle must be installed on top of floor.

UNITS WITH BOTH SIDES IN A PARTITION WALL
Angles are required on both sides of the floor.
**Application**

Ruskin FSDR25 and FSDR25SS “true round” low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSDR series is the ideal choice when round duct is used on a project. FSDR25 series dampers may be installed vertically in walls, or horizontally in masonry floors, and is rated for airflow and leakage in either direction. The FSDR25 is rated for velocity up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

The integral frame and unique “Cinch Plate” design provides a low cost, easy to install, high performing damper.

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**Features**

- Combination fire smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**Actuators/Heat Sensor Device**

- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators
- Quick detect heat-activated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

**Options**

- **FM Approvals** as Specification Tested Product.
- **DTS** (Damper Test Switch) test switch for cycle testing.
- **TS150** for reoponable operation in dynamic smoke management systems.
- **DSDF/DSDN** Duct Smoke Detector (Flow rated and No-Flow).
- **SP100** Switch Package to allow remote indication of damper blade position.
- **MCP** Control panels for testing or monitoring purpose or smoke management systems.
- **Factory Sleeves** of various lengths and gages to ensure field compliance with UL installation requirements.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

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**Specifications**

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<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Blade Seal</th>
<th>Leaksage Class</th>
<th>Hourly Rating</th>
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<td>Two-piece 14 gage (1.9) equivalent thickness galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
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<td>Two-piece 14 gage (1.9) equivalent thickness 304 stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
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<tr>
<td>FSDR25SS</td>
<td>20 gage (.9) 304 stainless steel. Standard 17&quot; (432) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness 304 stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).</td>
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**Maximum UL Classified Damper Sizes**

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<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
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<td>24&quot; Dia. (609)</td>
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INSTALLATION INSTRUCTIONS
FSDR60 and FSDR60SS COMBINATION FIRE AND SMOKE DAMPER
1 1/2 HOUR UL555 RATED  UL555S LEAKAGE CLASS 1 RATED

APPLICATION
The FSDR60(SS) are “true” round, single blade, combination fire/smoke dampers for openings in walls, partitions or masonry floors with ratings of less than 3 hours. They are designed for use with round duct and the openings may be square or round. The standard installation is with the leading edge of the closed blades within the wall or masonry floor. Installation may be obtained with the “CINCH” plate on one side for metal stud or masonry walls and “CINCH” plate both sides for wood stud wall and masonry floors.

MOUNTING
Vertical or horizontal.

MINIMUM SIZE
6” (152) diameter.

MAXIMUM UL CLASSIFIED SIZE
24” (610) diameter.

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
• TS150 FireStat for “Reopenable” Combination Fire and Smoke Dampers
• SP100 Switch Package
• EFL Electric Resettable “Fuse” Link
• EFL/SP100 Electric Resettable “Fuse” Link and Switch Package
• PFL Pneumatic Fuse Link
Dimensions shown in parentheses ( ) indicate millimeters.

RETAINING "CINCH" PLATES

RETAINING "CINCH" PLATE

Note:
Diameter + 6" (152) = plate size

1/2" (13) Minimum Overlap of wall/floor opening

1. Opening Clearance
A square opening in wood or metal stud walls or masonry walls and floors shall be a minimum of 1” (25) and a maximum of 2 1/2” (64) larger than the damper diameter. A round opening in masonry walls or floors shall be a minimum of 1” (25) and a maximum of 2 1/2” (64) larger than the damper diameter.

THE RETAINING “CINCH” PLATE MUST OVERLAP THE OPENING A MINIMUM OF 1/2” (13).

2. Damper Sleeve
The sleeve is integral to the damper and shall be of equal to or heavier than the gage of the duct as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.

3. Damper Orientation
The leading edge of the blade in the closed position must be within the plane of the wall. Vertical installation is illustrated and horizontal is similar (see General Installation). The damper may be installed with up to a 30 degree variance of the axle being horizontal (see Blade Orientation section).

4. Retaining “Cinch” Plates
DO NOT PLACE CINCH PLATES IN GROOVE
The retaining “cinch” plates are designed to grab and hold the sleeve while mounting flush against the wall or floor retaining the damper securely in the opening. The plates must overlap the opening a minimum of 1/2” (13) (see “Cinch” Plate section).

The “Cinch” plates are fastened to the wall or floor according to the following:
• Masonry Wall – “Cinch” plate required on only one side of the wall fastened to the wall with a minimum of 1 1/4” (32) #10 masonry screw.
• Masonry Floor – “Cinch” plate required on both the top and bottom of the floor fastened to the floor with a minimum of 1 1/4” (32) #10 masonry screw.
• Metal Stud Wall – “Cinch” plate required on only one side of the wall fastened to the wall by engaging the metal stud a minimum of 1 1/4” (13) with a #10 screw.
• Wood Stud Wall – “Cinch” plate required on both sides of the wall fastened to the wall by engaging the wood stud a minimum of 1 1/2” (38) with a #10 screw.

5. Duct/Sleeve Connections
Round break-away connections must be used. Either a 4” (102) wide drawband or #10 sheet metal screws spaced equally around the circumference of the ducts as follows:
• Duct diameters 22” (559) and smaller – 3 screws.
• Duct diameters over 22” (559) to 24” (610) – 5 screws.

Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer’s instructions: Hardcast, Inc. - Iron Grip 601, Precision - PA2084T, ECO Duct Seal 44-52 or Design Polymerics – DP 1010.

6. Actuator Connections
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

7. Installation and Maintenance
Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blade or actuators. Each fire/smoke damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions of NFPA 90A, 92A, UL684, local codes and in accordance with actuator manufacturer recommendations. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
GENERAL INSTALLATION
In Rated Masonry Walls or Floor/Ceiling Assemblies of Less than 3 Hour, with Square or Round Openings

ITEM DESCRIPTION
1. FSDR60(SS) Round Fire/Smoke Damper
2. Retaining "Cinch" Plate, 20 ga. steel
3. Duct
4. Masonry Wall or Floor
5. #10 Concrete Anchor, (min 1 1/4" (31) long)
6. Duct/Sleeve Connection
7. Opening Clearance

Note: Masonry walls only require a "cinch" plate on one side of the wall. Masonry floors require a "cinch" plate on both top and bottom side of the floor.

In Rated Metal or Wood Stud Framed Drywall Partitions of Less Than 3 Hour with Square Openings

ITEM DESCRIPTION
1. FSDR60(SS) Round Fire/Smoke Damper
2. Retaining "Cinch" Plate, 20 ga. steel
3. Duct
4. Metal Stud Wall (plate required on only one side)
5. Wood Stud Wall (plate required on both sides)
6. #10 Sheet Metal Screw (refer to section 4 for fastener requirements).
7. Duct/Sleeve Connection
8. Opening Clearance

Note: Metal stud walls require retaining "cinch" plates on only one side of the wall. Wood stud walls require retaining "cinch" plates on both sides of the wall.

BLADE ORIENTATION

Click to Return to: INDEX FSD SD IBD/DFD CFD
INSTALLATION INSTRUCTIONS
FSDR25 and FSDR25SS COMBINATION FIRE AND SMOKE DAMPER

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

APPLICATION
The FSDR25(SS) are “true” round, single blade, combination fire/smoke dampers for openings in walls, partitions or masonry floors with ratings of less than 3 hours. They are designed for use with round duct and the openings may be square or round. The standard installation is with the leading edge of the closed blades within the wall or masonry floor. Installation may be obtained with the “CINCH” plate on one side for metal stud or masonry walls and “CINCH” plate both sides for wood stud wall and masonry floors.

MOUNTING
Vertical or horizontal.

MINIMUM SIZE
6” (152) diameter.

MAXIMUM UL CLASSIFIED SIZE
24” (610) diameter.

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
• TS150 FireStat for “Reopenable” Combination Fire and Smoke Dampers
• SP100 Switch Package
• EFL Electric Resettable “Fuse” Link
• EFL/SP100 Electric Resettable “Fuse” Link and Switch Package
• PFL Pneumatic Fuse Link

Dimensions shown in parentheses (   ) indicate millimeters.

RETAINING "CINCH" PLATES

1. Opening Clearance
A square opening in wood or metal stud walls or masonry walls and floors shall be a minimum of 1” (25) and a maximum of 2 1/2” (64) larger than the damper diameter. A round opening in masonry walls or floors shall be a minimum of 1” (25) and a maximum of 2 1/2” (64) larger than the damper diameter.

THE RETAINING “CINCH” PLATE MUST OVERLAP THE OPENING A MINIMUM OF 1/2” (13).

2. Damper Sleeve
The sleeve is integral to the damper and shall be of equal to or heavier than the gage of the duct as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.

3. Damper Orientation
The leading edge of the blade in the closed position must be within the plane of the wall. Vertical installation is illustrated and horizontal is similar (see General Installation). The damper may be installed with up to a 30 degree variance of the axle being horizontal (see Blade Orientation section).

4. Retaining “Cinch” Plates
DO NOT PLACE CINCH PLATES IN GROOVE
The retaining “cinch” plates are designed to grab and hold the sleeve while mounting flush against the wall or floor retaining the damper securely in the opening. The plates must overlap the opening a minimum of 1/2” (13) (see “Cinchk” Plate section).

The “Cinchk” plates are fastened to the wall or floor according to the following:
• Masonry Wall – “Cinchk” plate required on only one side of the wall fastened to the wall with a minimum of 1 1/4” (32) #10 masonry screw.
• Masonry Floor – “Cinchk” plate required on both the top and bottom of the floor fastened to floor with a minimum of 1 1/4” (32) #10 masonry screw.
• Metal Stud Wall – “Cinchk” plate required on only one side of the wall fastened to the wall by engaging the metal stud a minimum of 1 1/4” (13) with a #10 screw.
• Wood Stud Wall – “Cinchk” plate required on both sides of the wall fastened to the wall by engaging the wood stud a minimum of 1 1/2” (38) with a #10 screw.

5. Duct/Sleeve Connections
Round break-away connections must be used. Either a 4” (102) wide drawband or #10 sheet metal screws spaced equally around the circumference of the ducts as follows:
• Duct diameters 22” (559) and smaller – 3 screws.
• Duct diameters over 22” (559) to 24” (610) – 5 screws.

Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer’s instructions: Hardcast, Inc. - Iron Grip 601, Precision - PA2084T, ECO Duct Seal 44-52 or Design Polymerics – DP 1010.

6. Actuator Connections
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

7. Installation and Maintenance
Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blade or actuators. Each fire/smoke damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions of NFPA 90A, 92A, UL684, local codes and in accordance with actuator manufacturer recommendations. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
GENERAL INSTALLATION

In Rated Masonry Walls or Floor/Ceiling Assemblies of Less than 3 Hour, with Square or Round Openings

ITEM DESCRIPTION
1. FSDR25 Round Fire/Smoke Damper
2. Retaining “Cinch” Plate, 20 ga. steel
3. Duct
4. Masonry Wall or Floor
5. #10 Concrete Anchor, (min 1½” (31) long
6. Duct/Sleeve Connection
7. Opening Clearance

Note: Masonry walls only require a “cinch” plate on one side of the wall. Masonry floors require a “cinch” plate on both top and bottom side of the floor.

In Rated Metal or Wood Stud Framed Drywall Partitions of Less Than 3 Hour with Square Openings

ITEM DESCRIPTION
1. FSDR25 Round Fire/Smoke Damper
2. Retaining “Cinch” Plate, 20 ga. steel
3. Duct
4. Metal Stud Wall (plate required on only one side)
5. Wood Stud Wall (plate required on both sides)
6. #10 Sheet Metal Screw (refer to section 4 for fastener requirements).
7. Duct/Sleeve Connection
8. Opening Clearance

Note: Metal stud walls require retaining “cinch” plates on only one side of the wall. Wood stud walls require retaining “cinch” plates on both sides of the wall.

BLADE ORIENTATION

NORMAL

30° OFF HORIZONTAL (Maximum)

Click to Return to: INDEX FSD SD IBD/DFD CFD
FSD60 and FSD60-2 Combination Fire Smoke Dampers
High Performance / Ultra-low Leakage
UL555 And UL555S 1 ½ Hour rating

Application
Ruskin FSD60 Series ultra low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD60 includes high strength, one-piece, airfoil blades to ensure the lowest resistance to airflow and leakage up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa). All FSD60 series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

Features
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Combination fire smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

Actuators / Heat Sensor Device
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

Options
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for reopenable operation in dynamic smoke management systems.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

Specifications

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C)</td>
<td>Concealed in frame.</td>
<td>1</td>
<td>1 ½</td>
</tr>
<tr>
<td>FSD60-2</td>
<td>8” x 6” (203 x 152)</td>
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<td></td>
<td></td>
<td></td>
<td>2</td>
<td>1 ½</td>
<td></td>
</tr>
</tbody>
</table>

Maximum UL Classified Damper Sizes

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD60</td>
<td>8”w x 6”h</td>
<td>32”w x 48”h (813 x 1219)</td>
<td>120”w x 96”h (3048 x 2438)</td>
</tr>
<tr>
<td>FSD60-2</td>
<td>(203 x 152)</td>
<td>(762 x 1219)</td>
<td>(3658 x 2438)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
** Maximum horizontal sizes may vary upon the actuators selected.
Application

Ruskin FSD60V combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD60V is UL listed with the blades running either horizontally or vertically. This is the perfect choice for applications where ducts run side by side and there is no room for actuators on the side of the dampers. The FSD60 includes high strength, one-piece, airfoil blades ensure the lowest resistance to airflow and leakage up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa). All FSD60 series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

FEATURES

- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Combination fire smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/HEAT SENSOR DEVICE

- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS

- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for reopenable operation in dynamic smoke management systems.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

FSD60V Combination Fire Smoke Dampers

Vertical Blade

UL555 and UL555S 1 ½ Hr. Rating

Model FSD60V series meets the requirements for combination fire and smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3235-0245:0126)
- New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60V</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1 ½</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD60V</td>
<td>6”w x 8”h (152 x 203)</td>
<td>48”w x 32”h (1219 x 813)</td>
<td>48”w x 30”h (1219 x 762)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
Application
Ruskin FSD60M Series ultra low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD60M is equipped with either a modulating electric or pneumatic actuator so it can be used as a volume control damper. All FSD60M series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

FEATURES
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Combination fire smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C).
- Factory mounted electric or pneumatic actuators
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for reopenable operation in dynamic smoke management systems.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

Model FSD60M series meets the requirements for combination fire and smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3235-0245:0126)
- New York City (MEA 252-05-E)

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60M</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td></td>
<td>1</td>
<td>1 1/2</td>
</tr>
</tbody>
</table>

**TABLE - MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD60M</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>32&quot;w x 48&quot;h (813 x 1219)</td>
<td>120&quot;w x 48&quot;h (3048 x 1219) Or 64&quot;w x 96&quot;h (1626 x 2438)</td>
</tr>
</tbody>
</table>

**RUSKIN**

Click to Return to: INDEX FSD SD IBD/DFD CFD
Application
Ruskin FSD60-BAL series ultra low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD60-BAL is equipped with a 24VAC/VDC actuator with built in potentiometer that allows the damper to open to numerous positions and still drive full open for smoke control purposes. All FSD60-BAL series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

Model FSD60-BAL series meets the requirements for combination fire and smoke dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal Listing (#3235-0245:0126)
• New York City (MEA 252-05-E)

FEATURES
• Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
• Combination fire smoke dampers are produced in an ISO 9001 certified factory.
• Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE
• Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C).
• Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
• Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS
• FM Approvals as Specification Tested Product.
• DTS (Damper Test Switch) test switch for cycle testing.
• TS150 for reopenable operation in dynamic smoke management systems.
• DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
• SP100 Switch Package to allow remote indication of damper blade position.
• MCP Control panels for testing or monitoring purpose or smoke management systems.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60-BAL</td>
<td>5' x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6' (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
<td>1 1/2</td>
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</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD60-BAL</td>
<td>8&quot;w x 6&quot;h</td>
<td>32&quot;w x 48&quot;h</td>
<td>30&quot;w x 48&quot;h</td>
</tr>
</tbody>
</table>
Ruskin FSD60XP Combination fire smoke damper is designed for hazardous locations. The FSD60XP is designed with a spring return fuse link mechanism which closes the damper in the event of a fire. The electrical actuator is placed in a UL and CSA: Class I, Division 1 & 2, Group B, C, D (NEMA 7), Class II, Division 1 & 2, Group E, F & G (NEMA 9), Class III, Hazardous (classified) Locations, outdoor application NEMA 4X housing. The damper with the actuator enclosure is suitable for dangerous locations due to the presence of flammable gases or vapors, combustible dust or easily ignitable fibers. All FSD60XP series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

**FEATURES**
- Combination fire smoke dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C).
- Factory mounted electric 120 volt AC, 24 volt AC or 230 Volt AC actuators.

**OPTIONS**
- **FM Approvals** as Specification Tested Product.
- **DTS** (Damper Test Switch) test switch for cycle testing.
- **MCP** Control panels for testing or monitoring purpose or smoke management systems.
- **Factory Sleeves** of various lengths and gages to ensure field compliance with UL installation requirements.
- **PFMA Angles** factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

Model FSD60XP series meets the requirements for combination fire and smoke dampers established by:
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3235-0245:0126)
- **New York City** (MEA 252-05-E)

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
</table>
| FSD60XP | 5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel | One-piece airfoil, nominal 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness. | Stainless steel sleeve type, pressed into frame | Stainless steel flexible metal compression type. | Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge. | Concealed in frame. | 1 | 1 ½  

### MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60XP</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>32&quot;w x 48&quot;h (813 x 1219)</td>
<td>64&quot;w x 48&quot;h (1626 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30&quot;w x 48&quot;h (762 x 1219)</td>
<td>60&quot;w x 48&quot;h (1524 x 1219)</td>
</tr>
</tbody>
</table>
## INSTALLATION INSTRUCTIONS

**FSD60, FSD60-2, FSD60-V, FSD60XP, FSD60M AND FSD60-BAL 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, 60-BAL 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).

**FSD60-BAL MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE**

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

**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 Damper
- 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

California State Fire Marshal Listing No.
FSD60, 60-2, 60M, 60-BAL, 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\(\frac{1}{8}\) per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 1\(\frac{1}{8}\) per foot (3 per 305) plus 2\(\frac{1}{2}\) (51), nor shall the opening be less than \(\frac{1}{4}\) (6) larger than the damper/sleeve assembly. For one angle installations, the opening shall be a minimum of 1\(\frac{1}{4}\) (6) to a maximum of 1\(\frac{1}{2}\) (25) larger than the overall size of the damper/sleeve assembly. The opening may be as much as 2\(\frac{1}{2}\) (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\(\frac{1}{2}\) (13) long welds staggered intermittently on both sides. Space fasteners 12\(\frac{1}{2}\) (122) on center above a maximum 2\(\frac{1}{2}\) (51) from the ends of the joining sections or from each corner. When joining multiple damper assemblies, a continuous 1\(\frac{1}{8}\) (3) bead of Dow-Corning 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 mullion 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 gage x 5\(\frac{1}{4}\) (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 gage requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide. 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 diagrams.

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\(\frac{1}{2}\)\(\frac{1}{2}\) x 1\(\frac{1}{2}\)\(\frac{1}{2}\) x 20 gage 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 2\(\frac{1}{4}\) (25). Do not weld or fasten angles together at corners of dampers. Ruskin fire/smoke dampers are approved break-away connections when installed as shown:

- **A. Break-away Duct/Sleeve Connections**
  - Rectangular ducts must use one or more of the connections depicted below:
    - **PLAIN:"SLIP**
    - **HEMATOID:"SLIP**
    - **INSIDE:"SLIP**
    - **DRIVE:"SLIP**
  - 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.

- **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.

- **D. Non-break-away Duct/Sleeve Connections**
  - If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers 36" (914) wide x 24" (610) high.

6. 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.

7. 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

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

VERTICAL INSTALLATION

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

ITEM DESCRIPTION

1. Actuator (location may vary).
2. Optional FireStat or SP-100.
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)
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 SP-100.
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)

FSD60-V INSTALLATION

(VERTICAL ONLY)

Click to Return to: INDEX FSD SD IBD/DFD CFD
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 gage 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 gage 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.
Applic

Ruskin FSD36 Series low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD36 includes single skin 16 (1.52) gage steel blade with three longitudinal grooves for reinforcement to ensure the lowest resistance to airflow and leakage up to 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa). All FSD36 series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

FEATURES

• Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
• Combination fire smoke dampers are produced in an ISO 9001 certified factory
• Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/HEAT SENSOR DEVICE

• Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
• Factory mounted electric or pneumatic actuators
• Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
• Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS

• FM Approvals as Specification Tested Product.
• DTS (Damper Test Switch) test switch for cycle testing.
• TS150 for reopenable operation in dynamic smoke management systems.
• DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
• SP100 Switch Package to allow remote indication of damper blade position.
• MCP Control panels for testing or monitoring purpose or smoke management systems.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

Model FSD36 series meets the requirements for combination fire and smoke dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal Listing (#3235-0245:0125) FSD35
Listing (#3235-0245:0124) FSD36
Listing (#3235-0245:0127) FSD37
• New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Blade Width</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakeag</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD35</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>3</td>
<td>1 1/2</td>
<td></td>
</tr>
<tr>
<td>FSD36</td>
<td>6&quot; (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSD37</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD35</td>
<td>8&quot;w x 6&quot;h</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
</tr>
<tr>
<td></td>
<td>(203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>120&quot;w x 96&quot;h (3048 x 2438)</td>
</tr>
<tr>
<td>FSD36</td>
<td></td>
<td>32&quot;w x 48&quot;h (813 x 1219)</td>
<td>30&quot;w x 48&quot;h (762 x 1219)</td>
</tr>
<tr>
<td>FSD37</td>
<td></td>
<td>32&quot;w x 48&quot;h (813 x 1219)</td>
<td>30&quot;w x 48&quot;h (762 x 1219)</td>
</tr>
</tbody>
</table>
APPLICATION

The FSD35, FSD36 and FSD37 are combination fire and smoke dampers designed to restrict the passage of flame and resist the passage of smoke. These combination fire and smoke dampers are designed for installation with the blades running horizontally. The standard installation is with the leading edge of the blade within the walls, partitions or masonry floors with ratings of less than 3 hours. For out of the wall or grille access installations refer to the GA or OW version of the FSD35 and FSD36.

FSD35 and FSD36 MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADES

Single section vertical or horizontal – 36"w x 48"h (914 x 1219)  
Multiple section vertical – 126"w x 96"h (3200 x 2438) or 72"w x 122"h (1829 x 3099)  
Multiple section horizontal – 144"w x 96"h (3658 x 2438)

FSD37 MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADES

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)

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instruction 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

California State Fire Marshal Listing No.

FSD35 – 3235-0245:0125
FSD36 – 3235-0245:0124
FSD37 – 3235-0245:0127

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" (3) per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 1/4" (6) per foot (3 per 305) plus 2" (51), nor shall the opening be less than 1/2" (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 or 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 10" (254) 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 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 gage 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 (1.6) for dampers up to 36" (914) wide x 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
Dampers are 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 11/16" x 11/8" x 20 gauge steel (38 x 38 x 1.0). For openings in metal stud, 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 side 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 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" (5) 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 fasteners shall be spaced at 12" (305) o.c. with a minimum of 2 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 11/2" (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:

- Rectangular Duct/Sleeve Connections
- Round Duct/Sleeve Connections
- Flanged Duct/Sleeve Connections
- Non-Break-away Duct/Sleeve Connections
- Actuator Connections
- Installation and Maintenance

Click to Return to: INDEX FSD SD IBD/DFD CFD
VERTICAL INSTALLATION
Damper may be installed with actuator on either side of the partition in accordance with the mounting label on the damper.

ITEM DESCRIPTION
1. Actuator (location may vary).
2. Optional FireStat or SP-100.
3. Auxiliary Operating Jackshaft
4. Damper
5. Over-Center Link
6. Sleeve
7. Caulking Material
8. Mounting Angles (PFMA, FAST or conventional angles)

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

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

FAST ANGLE (ONE ANGLE) INSTALLATION
Angle may be installed on either side of the floor.
Notes:
1. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.
2. Two section high dampers require a 14 gage 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 gage 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.
Applic

Ruskin FSD60-3 Series ultra-low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD60-3 includes high strength, one-piece, airfoil blades to ensure the lowest resistance to airflow and leakage up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa) [FSD60-3 Only]. All FSD60 series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

FSD60M is equipped with either a modulating electric or pneumatic actuator so it can be used as a volume control damper.

FSD60-BAL is equipped with a 24VAC/VDC actuator with built in potentiometer that allows the damper to open to numerous positions and still drive full open for smoke control purposes.

FEATURES
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Combination fire smoke dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for reopenable operation in dynamic smoke management systems.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60-3</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>FSD60-3</td>
<td>8&quot;w x 6&quot;h</td>
<td>30&quot;w x 48&quot;h</td>
<td>120&quot;w x 96&quot;h (3048 x 2438)</td>
</tr>
<tr>
<td></td>
<td>(203 x 152)</td>
<td>(762 x 1219)</td>
<td>(3048 x 2438)</td>
</tr>
<tr>
<td>FSD60-3M</td>
<td></td>
<td>30&quot;w x 48&quot;h</td>
<td>120&quot;w x 48&quot;h (3048 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(762 x 1219)</td>
<td>Or 64&quot;w x 96&quot;h (1626 x 2438)</td>
</tr>
<tr>
<td>FSD60-3BAL</td>
<td></td>
<td></td>
<td>120&quot;w x 48&quot;h (3048 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Or 60&quot;w x 96&quot;h (1524 x 2438)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
** Maximum horizontal sizes may vary upon the actuators selected.
APPLICATION
The FSD60-3 combination fire and smoke damper is designed to restrict the passage of flame and resist the passage of smoke. The FSD60-3 is designed for installation with the blades running horizontally. The standard installation is with the leading edge of the closed blades within the wall, partition or masonry floor with a fire resistance rating of 3 hours or more.

FSD60-3 MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE
- Single section vertical – 30”w x 48”h (762 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)

FSD60-3M MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE
- Single section vertical – 30”w x 48”h (762 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)

FSD60-3BAL MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE
- Single section vertical – 30”w x 48”h (762 x 1219).
- Single section horizontal – 30”w x 48”h (762 x 1219).

Note: Dimensions shown in parentheses ( ) indicate millimeters.
1. Opening Clearance

The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. The opening shall be a minimum of 1/8" per foot (3 per 305) longer than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 1/16" per foot (3 per 305) plus 2" (51), nor shall the opening be less than 1/16" (6) larger than the damper/sleeve assembly.

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 1/16" (3) bead of Dow-Corning 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 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 gage requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide. If a breakaway style duct/sleeve connection is not used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 must be installed with actuator above the floor and temperature release device below the floor.

5. Mounting Angles

Mounting angles shall be a minimum of 11/2" x 11/2" x 20 gage steel (38 x 38 x 1.0), installed on both sides of the partition and 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 PFMA.

a. Mounting Angle Fasteners

Mounting angle fasteners shall be #10 (M5) bolts or screws, #10 self-tapping concrete anchors or concrete screws, 1/2" (13) long tuck welds or 3/8" (3) diameter steel rivets.

b. Mounting Angle Fastener Spacing

Fasteners shall be spaced at 8" (203) o.c. with a minimum of 2 fasteners on each side, top and bottom.

6. Duct/Sleeve Connections

a. Break-away Duct/Sleeve Connections

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

- PLAIN #10 SLIP
- HEMMED #10 SLIP
- DOUBLE #10 SLIP
- INSIDE SLIP JOINT
- STANDING S (ANGLE REINFORCED)
- STANDING S (ANGLE REINFORCED)
- STANDING S (ANGLE REINFORCED)

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 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 Polymers – DP 1010 Hardcast, Inc. – Iron Grip 601 Precision – PA2084T Eco Duct Seal 44-52

The duct diameters are: 4" (102) – maximum 2 screws. 5" (127) – maximum 3 screws. 6" (152) – maximum 5 screws. 8" (203) – maximum 8 screws.

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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (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 wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

8. Installation and Maintenance

The damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or actuators. 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.
VERTICAL INSTALLATION

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

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Actuator (location may vary).</td>
</tr>
<tr>
<td>2.</td>
<td>Optional FireStat or SP-100.</td>
</tr>
<tr>
<td>3.</td>
<td>Auxiliary Operating Jackshaft</td>
</tr>
<tr>
<td>4.</td>
<td>Damper</td>
</tr>
<tr>
<td>5.</td>
<td>Over-Center Link</td>
</tr>
<tr>
<td>6.</td>
<td>Sleeve</td>
</tr>
<tr>
<td>7.</td>
<td>Caulking Material (may be on either side of damper frame).</td>
</tr>
<tr>
<td>8.</td>
<td>Mounting Angles (PFMA, FAST or conventional angles)</td>
</tr>
</tbody>
</table>

HORIZONTAL INSTALLATION

Damper must be installed with actuator the top side of the floor and temperature release device on the bottom side of the floor.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Actuator</td>
</tr>
<tr>
<td>2.</td>
<td>EFL or PFL as required (optional TS150 or SP100)</td>
</tr>
<tr>
<td>3.</td>
<td>Auxiliary Operating Jackshaft</td>
</tr>
<tr>
<td>4.</td>
<td>Damper</td>
</tr>
<tr>
<td>5.</td>
<td>Over-Center Lock</td>
</tr>
<tr>
<td>6.</td>
<td>Sleeve</td>
</tr>
<tr>
<td>7.</td>
<td>Caulking Material (may be on either side of damper frame).</td>
</tr>
<tr>
<td>8.</td>
<td>PFMA mounting angles</td>
</tr>
</tbody>
</table>

Click to Return to: INDEX       FSD       SD       IBD/DFD       CFD
**MAXIMUM UL CLASSIFIED SIZES**

**VERTICAL INSTALLATION**

96" (2438)

120" (3048)

See Notes 1 and 2.

**HORIZONTAL INSTALLATION**

144" (3658)

96" (2438)

Reinforcing plate: ½" x 7" x ½" x 14 ga. (16 x 178 x 16 x 2.0) Z-shape full length. See Notes 1 and 3

**Notes:**

1. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

2. Two section high dampers require a 14 gage 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 2 sections wide and 1 section high require a 14 gage reinforcing plate per horizontal installation detail. 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 a 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 a single thermal device.

**SHIP SECTION FIELD CONNECTION**

*Note:* Installer to run supply power to damper assembly thru a thermal device.
FSD35SS, FSD36SS and FSD37SS Fire Smoke Dampers
Stainless Steel UL555 And UL555S
Leakage Cladd 1, 2 and 3, 1 ½ Hr. Rating

Application
Ruskin FSD36SS Series low leak combination fire and smoke dampers provide point-of-origin fire and smoke containment. The FSD36SS includes single skin 16 (1.6) gage stainless steel blades with three longitudinal grooves for reinforcement to ensure the lowest resistance to airflow and leakage up to 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa). All FSD36SS series dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

FEATURES
• Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
• Combination fire smoke dampers are produced in an ISO 9001 certified factory.
• Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/HEAT SENSOR DEVICE
• Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C).
• Factory mounted electric or pneumatic actuators
• Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
• Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS
• FM Approvals as Specification Tested Product.
• DTS (Damper Test Switch) test switch for cycle testing.
• TS150 for reopenable operation in dynamic smoke management systems.
• DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
• SP100 Switch Package to allow remote indication of damper blade position.
• MCP Control panels for testing or monitoring purpose or smoke management systems.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

Model FSD36SS series meets the requirements for combination fire and smoke dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal Listing (#3235-0245:0125) FSD35SS Listing (#3235-0245:0124) FSD36SS Listing (#3235-0245:0127) FSD37SS
• New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD35SS</td>
<td>5&quot; x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage stainless steel</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FSD36SS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1 ½</td>
</tr>
<tr>
<td>FSD37SS</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD35SS</td>
<td>8&quot;w x 6&quot;h</td>
<td>30&quot;w x 48&quot;h</td>
<td>30&quot;w x 48&quot;h</td>
</tr>
<tr>
<td></td>
<td>(203 x 152)</td>
<td>(762 x 1219)</td>
<td>(762 x 1219)</td>
</tr>
<tr>
<td>FSD36SS</td>
<td>12&quot;w x 6&quot;h</td>
<td>24&quot;w x 32&quot;h</td>
<td>24&quot;w x 32&quot;h</td>
</tr>
<tr>
<td></td>
<td>(305 x 152)</td>
<td>(610 x 813)</td>
<td>(610 x 813)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
APPLICATION
The FSD35SS, FSD36SS and FSD37SS are combination fire and smoke dampers designed to restrict the passage of flame and resist the passage of smoke. These combination fire and smoke dampers are designed for installation with the blades running horizontally. The standard installation is with the leading edge of the blade with-in the walls, partitions or masonry floors with ratings of less than 3 hours. For out of the wall or grille access installations refer to the GA or OW version of the FSD35SS, FSD36SS and FSD37SS.

FSD35SS AND FSD36SS MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE
Single section vertical or horizontal – 30" w x 48" h (762 x 1219)  
Multiple sections vertical or horizontal – 90" w x 48" h (2286 x 1219)

FSD37SS MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADE
Single section vertical or horizontal – 24" w x 32" h (610 x 813)  
Multiple sections vertical or horizontal – 90" w x 32" h (2286 x 813)

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
• Drivemate No. 14880 Breakaway Connection
• Flanged System Breakaway Connection
• 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

California State Fire Marshal Listing No.
FSD35(SS) – 3235-0245:0125
FSD36(SS) – 3235-0245:0124
FSD37(SS) – 3235-0245:0127
NYC Department Of Building MEA 252-05-E

SEE COMPLETE MARKING ON PRODUCT

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. The damper opening shall be a minimum of 3/16" per foot (5 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 3/16" per foot (5 per 305) plus 2" (51), nor shall the opening be less than 1/4" (6) larger than the damper/sleeve assembly.

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 1/4" (3) bead of Dow-Corning 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 wall mount dampers include a 14 gage 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 gage requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 30A. If a breakaway style duct/sleeve connection is not used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 2" (51) from the sides of the wall or floor and must be attached only to the wall or floor. Damper orientation is depicted on sides equipped with actuator above or below the floor.

5. Mounting Angles
Mounting angles shall be a minimum of 11/2" x 11/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls and concrete/masonry wall/floor, mounting angles on both sides of the wall or floor 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 the corners of dampers.

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

b. Mounting Angle Fastener Spacing
Two angle installations the fasteners shall be spaced at 8" (205) o.c.

6. Duct/Sleeve Connections
a. Break-away Duct/Sleeve Connections
Rectangular ducts must use one or more of the connections depicted:

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 Polymeric – DP 1010 Hardcast, Inc. – Iron Grip 601 Precision – PA2084T 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 System 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 System 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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (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 wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

8. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or actuators. Dampers and their actuator(s) must be maintained, cycled and tested in accordance with the latest editions of NFPA 80, 90A, 92A, 92B, 105, UL864, AMCA 503 and local codes. The actuator(s) should follow the actuator manufacturer recommendations. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION

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

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

ITEM DESCRIPTION
1. Actuator (location may vary)
2. Heat Actuated Device (EFL, TS150, EFL/SP100 or PFL)
3. Auxiliary Operating Jackshaft
4. Damper
5. Over-Center Link
6. Sleeve
7. Caulking Material (See Instruction #2)
8. PFMA Mounting angles (See Instruction #5)
9. Duct/Sleeve Connection (See Instruction #6)
10. Mounting angle Fasteners (See Instruction #5A and B)

HORIZONTAL INSTALLATION

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

TWO ANGLE INSTALLATION
Angles are required on both sides of the floor.
NOTE

All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.
Applic

Application
Ruskin FSD60FA and FSD36FA combination fire and smoke dampers that allows through the grill access to the damper, actuator and heat actuated device. It is equipped with the industry’s shortest sleeve and is ideally suited for shaft wall applications. The FSD60FA and FSD36FA series dampers may be installed vertically in walls with fire resistance rating of less than 3 hours and are rated for airflow and leakage in either direction.

FEATURES
- Combination fire smoke dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for reopenable operation in dynamic smoke management systems.
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakege Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60FA</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
<td>1 1/2</td>
</tr>
<tr>
<td>FSD36FA</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1 1/2</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD60FA</td>
<td>12&quot;w x 8&quot;h (305 x 203)</td>
<td>48&quot;w x 48&quot;h (1219 x 1219)</td>
<td>N/A</td>
</tr>
<tr>
<td>FSD36FA</td>
<td></td>
<td>36&quot;w x 36&quot;h (914 x 914)</td>
<td></td>
</tr>
</tbody>
</table>

Model FSD60FA and FSD36FA series meets the requirements for combination fire and smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3235-0245:0126) FSD60FA
  Listing (#3235-0245:0124) FSD36FA
- New York City (MEA 252-05-E)
INSTALLATION INSTRUCTIONS
FSD60FA, FSD36FA, FSD60FA-M and FSD60FA-BL
FRONT ACCESS COMBINATION FIRE AND SMOKE DAMPER
1 1/2 HOUR UL555 AND UL555S CLASS I OR CLASS II CLASSIFIED RATING

APPLICATION
Model FSD60FA, FSD60FA-M, FSD60FA-BL and FSD36FA combination fire and smoke dampers are ideal for shaft wall applications. They are constructed with an integral grille mounting flange and no mounting angles are required in the installation. The fire/smoke damper can be offset in the damper sleeve for appropriate damper placement and installation space for the grille and optional OBD (grille and OBD supplied by others). The FSD60FA and FSD36FA are designed to operate with blades running horizontally.

To insure optimum operation and performance, the damper must be installed so that it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle damper using sleeve or frame. Do not lift damper using blades or actuator.

FSD60FA, FSD60FA-M and FSD60FA-BL MAXIMUM UL CLASSIFIED SIZES –
Opposed Blades
Vertical installation
Opening Size: 48"w x 48"h (1219 x 1219)
Duct Connection: 32"w x 48"h (813 x 1219)

FSD36FA MAXIMUM UL CLASSIFIED SIZES –
Opposed Blades
Vertical installation
Opening Size: 36"w x 36"h (914 x 914)
Duct Connection: 30"w x 36"h (726 x 914)

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

Note: Dimensions shown in parentheses ( ) indicate millimeters.

SEE COMPLETE MARKING ON PRODUCT

California State Fire Marshal Listing No.
FSD36FA – 3225-0245:0124
FSD60FA – 3230-0245:0126

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GENERAL INSTALLATION

1. Opening Clearance

Opening clearance for expansion is not required for the FSD36FA, FSD60FA. (Front Access). However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 24 1/2" x 20 1/2" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation

Dampers are designed to operate with blades running horizontally. Use “Mount With Arrow Up” label as a guide for proper damper orientation. The maximum the leading edge of the damper frame can be installed outside the wall:
Units up to 36" w x 36" h (914 x 914)
Steel Stud or Masonry Walls: 8" (203)
Wood Stud Walls: 6" (152)
Units above to 36" w x 36" h (914 x 914)
Steel Stud or Masonry Walls: 1 1/2" (38)

3. Insulation

Insulation shall be 1/4" (6) fiberfrax attached to all four sides of the damper and sleeve assembly (factory installed).

4. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

5. Fasteners

a. Fasteners spacing to attach the damper sleeve to the wall, minimum of 1 fastener per side.
   Steel Stud or Masonry Walls: 12" (305) c-to-c
   Wood Stud Walls: 6" (152) c-to-c
b. Fastener to attach mounting angles to the wall or floor
   In masonry walls use minimum #10 self-tapping concrete anchors. Screw must engage the wall or floor a minimum of 1 1/2" (38).
   In metal stud walls use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 1/2" (13).
   In wood stud walls use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).

6. Mounting Angles

Grille mounting flange is integral with the damper sleeve. No other mounting angles are required on front or backside of sleeve.

7. Duct/Sleeve Connection

a. Break-away Duct/Sleeve Connection

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 Polymers – DP 1010
Hardcast, Inc. – Iron Grip 601
Eco Duct Seal 44-52

8. Actuator Connections

Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

9. Installation and Maintenance

Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Lift or handle dampers using the sleeve or frame. Do not lift dampers using the blades or actuators. Dampers and their actuator(s) must be maintained, cycled, and tested in accordance with local codes, actuator manufacturer recommendations, and recognized standards or publications like: NFPA 80, 90A, 92A, 92B, 101, 105 and UL864
ITEM DESCRIPTION
1. UL rated wall assembly (metal stud or masonry)
2. Fire/Smoke damper sleeve
3. Steel framed grille with aluminum or steel core (with or w/o OBD) by others
4. FSD60FA or FSD36FA
5. Actuator and accessories cabinet. Refer to important note.
6. Duct connection (if required)
7. Fasteners (see instruction #2)

FSD60FA, FSD60FA-R and FSD60FA-BL Units Above 36” x 36”
APPLICATION

Front access combination fire smoke dampers under 14\" (356) in width have a 4\" (102) wide actuator cabinet. The area within the cabinet to access the actuator for replacement or field wiring is limited. The following instruction describes the process to be followed.

INSTRUCTION

Actuator Assembly Removal
1. Disconnect the power to the EFL (Electronic Fuse Link).
2. Loosen the bolt on the linkage arm.
3. Remove the truarc ring connecting the linkage arm to the blade bracket.
4. Remove the screws from the bearing brackets and the EFL bracket.
(The complete jackshaft assembly with the actuator and EFL will slide out of the cabinet.)

To Reinstall the Actuator Assembly
1. Make sure the actuator clamp is tight on to the jackshaft.
2. Slide the jackshaft assembly with the actuator, bearing brackets and the EFL attached to the damper housing.
Caution: when sliding the assembly into the cabinet, make sure the actuator slides onto the pin on the anti-rotation bracket.
3. Replace all the screws into the bearing brackets and EFL.
4. Attach the linkage arm to the blade bracket and re-install the truarc ring.
5. Tighten the bolt on the linkage arm.
6. Reconnect the power.
7. Cycle the damper to verify the damper opens and closes.

Note: Dimensions shown in parentheses ( ) indicate millimeters.

![Diagram of actuator assembly and components]
Ruskin FSDxxGA series dampers are “out of wall” Grille Access combination fire and smoke dampers. These dampers allow through the grille access to the damper, actuator and heat actuated device and are ideally suited for shaft wall applications. The FSDxxGA series dampers may be installed vertically in walls with fire resistance rating of less than 3 hours and are rated for airflow and leakage in either direction.

FEATURES

• Combination fire smoke dampers are produced in an ISO 9001 certified factory
• Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE

• Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
• Factory mounted electric or pneumatic actuators.
• Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS

• FM Approvals as Specification Tested Product.
• DTS (Damper Test Switch) test switch for cycle testing.
• TS150 for reopenable operation in dynamic smoke management systems.
• SP100 Switch Package to allow remote indication of damper blade position.
• MCP Control panels for testing or monitoring purpose or smoke management systems.

SPECIFICATIONS

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<tr>
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<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60GA</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1 1/2</td>
<td></td>
</tr>
<tr>
<td>FSD60-2GA</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2 1/2</td>
<td></td>
</tr>
<tr>
<td>FSD60VGA</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2 1/2</td>
<td></td>
</tr>
<tr>
<td>FSD36GA</td>
<td>5” x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2 1/2</td>
<td></td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60GA</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
</tr>
<tr>
<td>FSD60-2GA</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
</tr>
<tr>
<td>FSD60VGA</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
</tr>
<tr>
<td>FSD36GA</td>
<td>5” x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
</tr>
<tr>
<td>FSD36SS/GA</td>
<td>5” x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>6” (152) wide and 16 (1.6) gage stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
</tr>
</tbody>
</table>

Options:

- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for reopenable operation in dynamic smoke management systems.
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.

Model FSD60GA and FSD36GA series meets the requirements for combination fire and smoke dampers established by:

- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3235-0245:0126) FSD60GA
- Listing (#3235-0245:0124) FSD36GA
- **New York City** (MEA 252-05-E)
INSTALLATION INSTRUCTIONS

FSD35GA, FSD36GA, FSD60GA, FSD60-2GA, FSD35SSGA, FSD36SSGA AND FSD37SSGA

COMBINATION FIRE AND SMOKE DAMPERS

1 1/2 HOUR UL555 RATED  UL555S LEAKAGE RATED CLASS 1, 2 AND 3

APPLICATION

The FSDxx/GA series dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. Grille access "GA" combination fire smoke dampers are designed to be installed from one side of the wall or partition and permit access to the dampers component through the wall grille. GA combination fire smoke dampers may be used in fire resistance rating applications of less than 3 hours.

FSD35GA, FSD36GA MAXIMUM UL CLASSIFIED SIZES
Vertical installation – 36"w x 36"h (914 x 914)

FSD35SSGA, FSD36SSGA MAXIMUM UL CLASSIFIED SIZES
Vertical installation – 30"w x 36"h (762 x 914)

FSD37SSGA MAXIMUM UL CLASSIFIED SIZES
Vertical installation – 24"w x 32"h (610 x 813)

FSD60GA, FSD60-2GA MAXIMUM UL CLASSIFIED SIZES
Vertical installation – 32"w x 36"h (813 x 914)

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS

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

- 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

California State Fire Marshal Listing No.
FSD35GA – 3235-0245:0125
FSD36GA – 3235-0245:0124
FSD37GA – 3235-0245:0127
FSD60GA – 3235-0245:0126
NYC Department Of Building MEA 252-05-E
GENERAL INSTALLATION

1. Opening Clearance
Opening clearance for expansion is not required for the Grille Access dampers. However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 24 1/2" x 20 1/2" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation
Dampers are designed to operate with blades running horizontally, only units with “V” can be mounted with vertical blades. Use “Mount With Arrow Up” label as a guide for proper damper orientation. The maximum the leading edge of the damper can be installed outside the wall:
- Steel Stud or Masonry Walls: 8" (203)
- Wood Stud Walls: 6" (152)

3. Insulation
Insulation shall be 1/4" (6) fiberfrax attached to all four sides of the damper and sleeve assembly (factory installed).

4. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

5. Fasteners
   a. Fasteners spacing to attach the damper sleeve to the wall, minimum of 1 fastener per side.
      - Steel Stud or Masonry Walls: 12" (305) c-to-c
      - Wood Stud Walls: 6" (152) c-to-c
   b. Fastener to attach mounting angles to the wall
      - In masonry walls use minimum #10 self-tapping concrete anchors. Screw must engage the wall a minimum of 1 1/2" (38).
      - In metal stud walls use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 1/2" (13).
      - In wood stud walls use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).

6. Mounting Angles
Grille mounting flange is integral with the damper sleeve. No other mounting angles are required on front or backside of sleeve.

7. Duct/Sleeve Connection
   a. Break-away Duct/Sleeve Connection
      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
      - Hardcast, Inc. – Iron Grip 601
      - Nexus or Ward and roll-formed flanged connection by TDF
      - Precision – PA2084T
      - Eco Duct Seal 44-52

   c. Flanged Break-away Style Duct/Sleeve Connections
      Flanged connection systems manufactured by Ductmate, Nexus or Ward and roll-formed flanged connection by TDF and TDC are approved breakaway connections. Connection between manufactured systems may be used with metal or plastic cleats, Butyl or neoprene gaskets, and/or bolted or non-bolted corners. See Flanged System Breakaway Connections Installation Instruction Supplement for detail.

   d. Non-Break-away Duct/Sleeve Connections
      If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

8. Actuator Connections
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

9. Installation and Maintenance
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Lift or handle dampers using the sleeve or frame. Do not lift dampers using the blades or actuators. Dampers and their actuator(s) must be maintained, cycled, and tested in accordance with local codes, actuator manufacturer recommendations, and recognized standards or publications like: NFPA 80, 90A, 92A, 92B, 101, 105 and UL864.

Click to Return to:  INDEX  FSD  SD  IBD/DFD  CFD
VERTICAL INSTALLATION

ITEM DESCRIPTION
1. Actuator (location may vary)
2. Auxiliary operating jackshaft
3. Damper
4. Over-Center Link
5. Sleeve
6. 1/4" (6) thick Insulation (factory installed)
7. Fasteners – See Note #5
8. Duct/Sleeve connection
9. Duct
10. Wall: steel or wood stud or masonry
11. Grille "By Others"

Important Note: For dampers larger than 36"w x 36"h (914 x 914) through 48"w x 48"h (1219 x 1219) see FSD60AF model.
Applic

Application

Ruskin FSDxxOW series dampers are "out of wall" or "out of floor" combination fire and smoke dampers. The OW series dampers are designed so that the damper may be installed up to 8" (203) outside the fire rated wall or floor assembly. The FSDxxOW series dampers may be installed vertical (in walls) or horizontal (concrete floors) with fire resistance rating of less than 3 hours and are rated for airflow and leakage in either direction.

FEATURES

• Combination fire smoke dampers are produced in an ISO 9001 certified factory
• Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE

• Actuators shall be qualified in accordance with UL555 to an elevated temperature of 250°F (121°C) or 350°F (177°C).
• Factory mounted electric or pneumatic actuators
• Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
• Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS

• FM Approvals as Specification Tested Product.
• DTS (Damper Test Switch) test switch for cycle testing.
• TS150 for reopenable operation in dynamic smoke management systems.
• DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
• SP100 Switch Package to allow remote indication of damper blade position.
• MCP Control panels for testing or monitoring purpose or smoke management systems.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

Model FSD60/OW and FSD36/OW series meets the requirements for combination fire and smoke dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal Listing (#3235-0245:0126) FSD60/OW
Listing (#3235-0245:0124) FSD36/OW
• New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD60/OW</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
<td>1 1/2</td>
</tr>
<tr>
<td>FSD60-2/OW</td>
<td>5&quot; x 16 gage galvanized, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1/2</td>
</tr>
<tr>
<td>FSD60V/OW</td>
<td>5&quot; x 16 gage galvanized, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1/2</td>
</tr>
<tr>
<td>FSD36/OW</td>
<td>5&quot; x 16 gage galvanized, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1/2</td>
</tr>
<tr>
<td>FSD36SS/OW</td>
<td>5&quot; x 16 gage galvanized, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1/2</td>
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</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>All Models</td>
<td>8&quot;w x 6&quot;h (195 x 152)</td>
<td>36&quot;w x 36&quot;h (914 x 914)</td>
<td>N/A</td>
</tr>
</tbody>
</table>
APPLICATION

The FSDxx/OW series dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. Out of wall “OW” combination fire smoke dampers are designed so that the leading edge of the damper frame can be up to 8” (203) out of the wall, partition or masonry floor. OW combination fire smoke dampers may be used in fire resistance rating applications of less than 3 hours. OW dampers may be used for through penetrations or duct terminations where the damper cannot be installed within the wall or floor.

FSD35/OW, FSD36/OW MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADE
   Vertical or horizontal installation
   36"w x 36"h (914 x 914)

FSD35SS/OW, FSD36SS/OW MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADE
   Single section vertical or horizontal installation
   30"w x 36"h (762 x 914)
   Multiple section assembly vertical or horizontal installation
   36"w x 36"h (914 x 914)

FSD37SS/OW MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADE
   Single section vertical or horizontal installation
   24"w x 32"h (610 x 813)
   Multiple section assembly vertical or horizontal installation
   36"w x 32"h (914 x 813)

FSD60OW and FSD60-2/OW MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADE
   Single section vertical installation
   32"w x 36"h (813 x 914)
   Single section horizontal installation
   30"w x 36"h (762 x 914)
   Multiple section assembly vertical or horizontal installation
   36"w x 36"h (914 x 914)

FSD60V/OW MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADE
   Single section vertical or horizontal installation
   36"w x 32"h (914 x 813)

Dimensions shown in parentheses ( ) indicate millimeters.

SEE COMPLETE MARKING ON PRODUCT

California State Fire Marshal Listing No.
FSD35OW – 3235-0245:0125
FSD36OW – 3235-0245:0124
FSD37OW – 3235-0245:0127
FSD60OW – 3235-0245:0126
NYC Department Of Building MEA 252-05-E
GENERAL INSTALLATION

1. Opening Clearance
Opening clearance for expansion is not required for Out of Wall or Floor dampers. (Front Access). However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 24 1/2" x 20 1/2" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation
Dampers are designed to operate with blades running horizontally only units with “V” can be mounted with vertical blades. Use “Mount With Arrow Up” label as a guide for proper damper orientation. Horizontal mounted dampers (Floor mount) may be installed with actuator above or below the floor. The maximum the leading edge of the damper frame can be installed outside the wall:

   Steel Stud or Masonry Walls: 8" (203)
   Wood Stud Walls: 6" (152)
   Masonry Walls: 8" (203)

3. Insulation
Insulation shall be 1/4" (6) fiberfrax attached to all four sides of the damper and sleeve assembly (factory installed).

4. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

5. Fasteners
   a. Fasteners spacing to attach the mounting angles or damper sleeve to the wall or floor and mounting angles to the damper sleeve, minimum of 1 fastener per side.
      Steel Stud or Masonry Walls: 12" (305) c-to-c
      Wood Stud Walls: 6" (152) c-to-c
   b. Fastener to attach mounting angles to the wall or floor.
      In masonry walls or floor use minimum #10 self-tapping concrete anchors. Screw must engage the wall or floor a minimum of 1/2" (13).
      In metal stud use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 1/2" (13).
      In wood stud use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).
   c. Fastener to attach mounting angles to the damper sleeve.
      Mounting angles to be connected to the damper sleeve with minimum number 10 (M5) screws on bolts, tack welds or 1/2" (13) long welds.

6. Mounting Angles
   a. Mounting angles shall be a minimum of 1/1/2" x 1/1/2" x 20 gage steel (38 x 38 x 1.0). Ruskin “FAST” angle or only a single conventional mounting angle is required on side opposite of the damper and fastened to the damper sleeve and wall or floor. Do not weld or fasten conventional angles together at the corners of damper.
   b. Optional installation where the damper is larger than the opening in the wall, the mounting angle is not required and the damper is to be fastened to the wall from the inside of the damper sleeve. Mounting angles may be used but are not required.
   c. Optional installation where the damper is larger than the opening in the floor and the damper is mounted on the top side of the floor, the mounting angle is not required and the damper is to be fastened to the floor from the inside of the damper sleeve. Mounting angles may be used but are not required.

7. Duct/Sleeve Connection
   a. Break-away Duct/Sleeve Connection
      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 Connection
      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 Polymers – DP 1010
      • Precision – PA2084T
      • Hardcast, Inc. – Iron Grip 601
      • Eco Duct Seal 44-52
   c. Flanged Break-away Style Duct/Sleeve Connection
      Flanged connection systems manufactured by Ductmate, Nexus or Ward and roll-formed flanged connection by TDF and TDC are approved breakaway connections. Connection between manufactured systems may be used with metal or plastic cleats, Butyl or neoprene gaskets, and/or bolted or non-bolted corners. See Flanged System Breakaway Connections Supplement for detail.
   d. Non-Break-away Duct/Sleeve Connection
      If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36” (914) wide x 24” (610) high and 14 gage (2.0) for dampers larger than 36” (914) wide x 24” (610) high.

8. Actuator Connection
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

9. Installation and Maintenance
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Lift or handle dampers using the sleeve or frame. Do not lift dampers using the blades or actuators. Dampers and their actuator(s) must be maintained, cycled, and tested in accordance with local codes, actuator manufacturer recommendations, and recognized standards or publications like: NFPA 80, 90A, 92A, 92B, 101, 105 and UL864.
VERTICAL INSTALLATION

ITEM DESCRIPTION
1. Actuator (location may vary).
2. Auxiliary Operating Jackshaft
3. Damper
4. Over-Center Link
5. Sleeve
6. Caulking Material (may be on either side of damper frame).
7. Mounting Angle (See Note #6)
8. Fasteners – (See Note #5)
9. Duct/Sleeve connection
10. Duct
11. Wall: Wood or Steel Stud or Masonry
12. Grille (by Others)
13. 1/4" (6) thick insulation (Factory Installed)

OPTIONAL INSTALLATION

Installation shows the combination fire and smoke damper is larger than the opening in the wall partition with the sleeve penetrating through the partition. These units can be used for a through penetration or duct termination. Retaining angles are not required but are optional.
HORIZONTAL INSTALLATION

ITEM DESCRIPTION
1. Actuator (location may vary).
2. Auxiliary Operating Jackshaft
3. Damper
4. Over-Center Link
5. Sleeve
6. Caulking Material (may be on either side of damper frame).

ITEM DESCRIPTION
7. Mounting Angle (See Note #6)
8. Fasteners – (See Note #5)
9. Duct/Sleeve connection
10. Duct
11. Masonry floor/ceiling
12. 1/4" (6) thick insulation (Factory Installed)
Optional installation shows the combination fire and smoke damper is larger than the opening in the floor with the sleeve penetrating through the floor. These units can be used for a through penetration or duct termination. Retaining angles are not required when the damper is positioned on top of the floor.

**ITEM DESCRIPTION**

1. Actuator (location may vary).
2. Auxiliary Operating Jackshaft
3. Damper
4. Over-Center Link
5. Sleeve
6. Caulking Material (may be on either side of damper frame).
7. Mounting Angle (See Note #6)
8. Fasteners – (See Note #5)
9. Duct/Sleeve connection
10. Duct
11. Masonry floor/ceiling
12. 1/4" (6) thick insulation (Factory Installed)
13. Grille (by Others)

**Above Floor Installation**

**Below Floor Installation**
Ruskin FSD36C and FSD60C are two dampers in one. They are one hour fire rated, UL labeled Corridor Damper and 1 ½ hour fire rated, for wall and masonry floors. The FSD60C is leakage class 1 and the FSD36C is leakage class 2. As Corridor Damper they are designed to be used in openings in the ceilings of wood stud or metal stud constructed interior tunnel corridors. As a 1 ½ hour combination fire smoke damper it is designed to provide point-of-origin fire and smoke containment when installed vertically in walls, or horizontally in masonry floors. The FSD36C and FSD60C are rated up to 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa) with air flow and leakage in either direction.

Model FSD36C and FSD60C series meets the requirements for combination fire and smoke dampers established by:

- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3235-0245:0122) FSD36C Listing (#3235-0245:0121) FSD60C
- New York City (MEA 252-05-E)

### FEATURES
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Corridor dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

### ACTUATORS/HEAT SENSOR DEVICE
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

### OPTIONS
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for re-openable operation in dynamic smoke management systems.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSD36C</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>6&quot; (152) wide and 16 (1.6) gage galvanized steel</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
<td>1 Hour Corridor</td>
</tr>
<tr>
<td>FSD60C</td>
<td>One-piece airfoil, 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1 ½ Hour Fire/Smoke</td>
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### MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FSD36C</td>
<td>8&quot;w x 6&quot;h</td>
<td>24&quot;w x 24&quot;h (576 x 576)</td>
<td>N/A</td>
</tr>
<tr>
<td>FSD60C</td>
<td>(203 x 152)</td>
<td>(576 x 576)</td>
<td></td>
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</table>
APPLICATION

The FSD60C AND FSD36C is a UL Classified 1 Hour Corridor damper. It is designed for installation in the ceiling penetrations of tunnel corridors. The FSD60C and FSD36C may also be installed as a "standard" 1 1/2 hour combination fire/smoke damper in walls or floors (Refer to the FSD60 and FSD36 installation instructions when installing as a "standard" 1 1/2 hour combination fire/smoke damper.) The FSD60C and FSD36C closes on loss of power.

FSD60C and FSD36C MAXIMUM UL CLASSIFIED SIZE OPPOSED BLADES
Single section horizontal – 24"w x 24"h (610 x 610).

FSD60C-LP and FSD36C-LP MAXIMUM UL CLASSIFIED SIZE OPPOSED BLADES
Single section horizontal – 24"w x 14"h (610 x 356).

Dimensions shown in parentheses ( ) indicate millimeters.

APPLICATION ILLUSTRATIONS

FIG. 1 - ACTUATOR ABOVE RATED CORRIDOR CEILING

FIG. 2 - ACTUATOR BELOW RATED CORRIDOR CEILING

ITEM DESCRIPTION

1. Actuator (may be in or out of airstream)
2. Damper Frame
3. TS150, EFL, PFL or SP100 (location may vary)
4. Sleeve
5. Over-Center Link
6. Mounting Angles See Note 5.
7. Joint, Sleeve to Duct – Break-away Connections
8. Caulking Material
9. Steel or Wood Stud Construction (single studs only)
1. Opening Clearance

   a. C1 Installation
   The opening shall be 1/4" (6) larger than the overall size of the damper and sleeve assembly.

   b. C2 Installation
   The opening shall be large enough to allow the grille or difuser to overlap the bottom edges of the corridor ceiling and lay flat against the ceiling material.

2. Ceiling Construction

   The minimum ceiling partition construction will consist of single 2 x 4 wood studs or metal studs on 24" (610) center to center. C3 applications are metal stud only. UL classified 5/8" (16) gypsum will be attached to the studs with 15/8" (41) drywall screws on 12" (305) centers or no. 6d nails on 7" (178) centers. Refer to the framing details included in these instructions.

3. Fasteners and Sealant

   a. C1 Installation
   When fastening the damper to field supplied sleeves, the 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 all fasteners 6" (152) on center and a maximum 2" (51) from the ends of each corner. A bead of Dow Corning Silastic 732 RTV, Dow Corning 999 or GE RTV 108 sealant shall be applied between the damper and sleeve. Press the surface of the sealant in place to dispel the air. Only one side of the damper requires caulking.

   b. C2 Installation
   When fastening the damper to field supplied sleeves, the 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 all fasteners 6" (152) on center and a maximum 2" (51) from the ends of each corner. A bead of Dow Corning Silastic 732 RTV, Dow Corning 999 or GE RTV 108 sealant shall be applied between the damper and sleeve. Press the surface of the sealant in place to dispel the air. Only one side of the damper requires caulking.

4. Damper Sleeve

   a. Break-away Duct/Sleeve Connections
   Duct diameters over 22" (559) and including 36" (914) – maximum 3 screws.
   Duct diameters 22" (559) and smaller – maximum 3 screws.

   b. Non-Break-away Duct/Sleeve Connections
   Rectangular ducts must use one or more of the connections depicted below:
   - 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.

   c. Flanged Break-away Style Duct/Sleeve Connections
   Rectangular ducts must use one or more of the connections depicted below:
   - Duct diameters 22" (559) and including 36" (914) – maximum 3 screws.
   - Duct diameters over 36" (914) and up to and including 191" (4851) total perimeter – maximum 8 screws.

   d. Non-Break-away Duct/Sleeve Connections
   Rectangular ducts must use one or more of the connections depicted below:
   - Duct diameters 22" (559) and including 36" (914) – maximum 3 screws.
   - Duct diameters over 36" (914) and up to and including 191" (4851) total perimeter – maximum 8 screws.

   e. Flanged Break-away Style Duct/Sleeve Connections
   Rectangular ducts must use one or more of the connections depicted below:
   - Duct diameters 22" (559) and including 36" (914) – maximum 3 screws.
   - Duct diameters over 36" (914) and up to and including 191" (4851) total perimeter – maximum 8 screws.

5. Mounting Angles

   a. C1 Installation
   Ruskin FAST Angle or Picture Frame Mounting Angles (PFMA) are UL tested and may be used in lieu of the following conventional mounting angles. The mounting angles shall be 11/2" x 11/2" x 20 gage (38 x 38 x 1.6) minimum and shall be fastened with minimum no. 10 (M5) bolts or screws, 3/16" (5) minimum diameter for small and 1/2" (13) long welds. Do not fasten or weld angles together at corners of dampers. Space fasteners 12" (305) maximum on center.

   b. C2 Installation
   Ruskin FAST Angle or Picture Frame Mounting Angles (PFMA) may be used above the framing otherwise the mounting angle above the framing shall be 11/2" x 11/2" x 20 gage (38 x 38 x .9) minimum and shall be fastened with number 10 (M5) bolts or screws, 3/16" (5) minimum diameter for small and 1/2" (13) long welds. Do not fasten or weld angles together at corners of dampers. Space fasteners 12" (305) maximum on center. The angle used below the framing shall be 1" x 21/2" x 16 gage (25 x 64 x 1.6) minimum and shall be fastened to the damper sleeve like the angle used above the framing.

   c. C3 Installation
   Mounting angles are required only on the topside of the framing. The mounting angles shall be fastened with minimum no. 10 (M5) bolts or screws, 3/16" (5) minimum diameter for small and 1/2" (13) long welds. Space fasteners 12" (305) maximum on center. The mounting angles will be secured to the top of the ceiling partition with minimum no. 8 x 1½" (M4 x 41) screws. A minimum of one screw shall be placed at each end of the angle.

6. Duct/Sleeve Connections

   a. Break-away Duct/Sleeve Connections
   Damper sleeve gage requirements are listed in the SMACNA Fire, Smoke, and Radiation Damper Installation Guide. If a breakaway style duct/sleeve connection is not used, the sleeve shall be a minimum of 16 gage (1.6). 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 an actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

   b. Round and Oval Break-away Connections
   Dutch Oval, 36" (914) oval, and 24" (610) high can be extended up to 50" (1250) beyond the fire wall or partition.

   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 System 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 gage (1.6) for dampers up to 36" (914) wide and 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance

   To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
FSD60C AND FSD36C
C2 Installation
V-Frame Grille Application
(Wood or Steel Stud Construction)

FIG. 3 - DAMPER WITH ACTUATOR MOUNTED EXTERNALLY

FIG. 4 - DAMPER WITH ACTUATOR MOUNTED INTERNALLY
(Allows access to the actuator through the grille)

FSD60C AND FSD36C
C3 Installation
Flat-Frame Diffuser Application
(Steel Stud Construction Only)

FIG. 5 - DAMPER WITH ACTUATOR MOUNTED EXTERNALLY

FIG. 6 - DAMPER WITH ACTUATOR MOUNTED INTERNALLY
(Allows access to the actuator through the diffuser)

ITEM DESCRIPTION
1. Actuator (may be in or out of airstream)
2. Damper Frame
3. TS150, EFL, PFL (location may vary)
4. Sleeve
5. Over-Center Link
6. Mounting Angles See Note 5.

ITEM DESCRIPTION
7. Mounting Angles 1 1/2 x 1 1/2 x 16 gage min.
8. Joint, Sleeve to Duct – Break-away Connections
9. Caulking Material
10. Steel Grille/Diffuser (by others)
11. Steel or Wood Stud Construction (single studs only)
12. Steel Construction only
Wood Stud Construction

- 2 x 4 (Nom)
- Wood Studs
- Min. 2 #16d Nails
- Max. 2
- 24" C-C (610)
- Min. (Typ) 5/8" Min. U.L. Classified
- Drywall Typ. Both Sides
- Attach with 1 - 5/8" Drywall Screws 12" C-C
- 2" (51) Stl. Runner
- 2" (51) Steel Studs
- 2 Sheet Metal Screws

Steel Stud Construction

- 24" C-C (610) Max.
- Steel Studs
- Stl. Runner
- Cut Flanges, Bend Web Down & Secure to Runner w/2 Sheet Mtl. Screws (Typ)
- 2" (203)
- 5/8" Min. U.L. Classified Drywall Typ. Both Sides Attach with Drywall Screws 12" C-C
- 2" (51)
FSDR60C AND FSDR25C COMBINATION FIRE SMOKE DAMPERS
TRUE ROUND ULTRA-LOW LEAKAGE
UL555 AND UL555S CLASS I, 1 AND 1½ HR. RATING

APPLICATION
Ruskin FSDR60C is two dampers in one. One hour fire rated, UL labeled Corridor Damper and 1½ hour fire rated, for wall and masonry floors. The FSDR60C is leakage class 1. As Corridor Damper they are designed to be used in openings in the ceilings of wood stud or metal stud constructed interior tunnel corridors. As a 1½ hour combination fire smoke damper it is designed to provide point-of-origin fire and smoke containment when installed vertically in walls, or horizontally in masonry floors. The FSD36C and FSD60C are rated up to 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa) with air flow and leakage in either direction.

FEATURES
• Combination fire smoke dampers are produced in an ISO 9001 certified factory
• Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/HEAT SENSOR DEVICE
• Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
• Factory mounted electric or pneumatic actuators.
• Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

OPTIONS
• DTS (Damper Test Switch) test switch for cycle testing.
• TS150 for reopenable operation in dynamic smoke management systems.
• DSDF Duct Smoke Detector (Flow rated)
• SP100 Switch Package to allow remote indication of damper blade position.
• MCP Control panels for testing or monitoring purpose or smoke management systems.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Blade Seal</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
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<tbody>
<tr>
<td>FSDR25C</td>
<td>20 gages (.9) galvanized steel. Standard 17” (432) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).</td>
<td>1</td>
<td>1</td>
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<tr>
<td>FSDR60C</td>
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<td></td>
<td></td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
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</thead>
<tbody>
<tr>
<td>FSDR60C, FSDR25C</td>
<td>6” Dia. (152)</td>
<td>24” Dia. (609)</td>
</tr>
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</table>
APPLICATION
The FSDR60(SS)C is a true round corridor damper designed for installation in the ceiling penetration of "tunnel type" corridors constructed from metal studs. The FSDR60(SS)C-LP is designed to fail close upon loss of power.

DAMPER SIZES
6" (152), 8" (203), 10" (254) and 12" (305) diameter.

GENERAL INSTALLATION
1. Ceiling Construction
   The minimum ceiling partition construction will consist of metal studs on 24" (610) center to center. UL classified 5/8" (16) gypsum will be attached to the studs with 1 1/8" (29) drywall screws at 12" (305) centers.
2. Opening Clearance
   A square opening in metal stud ceiling partition shall be a minimum of 1" (25) and a maximum of 2 1/2" (64) larger than the damper diameter.
   THE RETAINING "CINCH" PLATE MUST OVERLAP THE OPENING A MINIMUM OF 1/2" (13).
3. Damper Sleeve
   The sleeve is integral to the damper and shall be of equal to or heavier than the gage of the duct as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.
4. Damper Orientation
   The leading edge of the blade in the closed position must be within the plane of the ceiling partition.
5. Retaining "Cinch" Plates
   DO NOT PLACE CINCH PLATES IN GROOVE
   The retaining "cinch" plates are designed to grab and hold the sleeve while mounting flush against the ceiling partition retaining the damper securely in the opening. The plates must overlap the opening a minimum of 1/2" (13) (see "Cinch" Plate section). The "Cinch" plates are fastened to the wall or floor according to the following:
   • Metal Stud Ceiling Partition – "Cinch" plate required on both sides of the partition fastened to the partition by engaging the metal stud a minimum of 1/2" (13) with a #10 screw.
6. Duct/Sleeve Connections
   Round break-away connections must be used. Either a 4" (102) wide drawband or #10 sheet metal screws spaced equally around the circumference of the ducts as follows:
   • Duct diameters 22" (559) and smaller – 3 screws.
   Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer's instructions:
   Hardcast, Inc. - Iron Grip 601
   Precision - PA2084T
   ECO Duct Seal 44-52
   Design Polymers – DP 1010.
7. Actuator Connections
   Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

8. Installation and Maintenance
   To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire/smoke damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions of NFPA 90A, 92A, UL864, local codes and in accordance with actuator manufacturer recommendations. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

Dimensions shown in parentheses (   ) indicate millimeters.

INSTALLATION SUPPLEMENTS
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:
• TS150 FireStat for "Reopenable" Combination Fire and Smoke Dampers
• SP100 Switch Package
• EFL Electric Resettable Link
• EFL/SP100 Electric Resettable "Fuse" Link and Switch Package
• PFL Pneumatic Fuse Link

Dimensions shown in parentheses (   ) indicate millimeters.

RETAINING "CINCH" PLATES

Note:
Diameter + 6" (152) = plate size

1/2" (13) Minimum Overlap of opening
GENERAL INSTALLATION

ITEM DESCRIPTION
1. FSDR60C Round Corridor Damper
2. Retaining "cinch" Plate, 20 ga. steel (one plate required on each side of ceiling partition)
3. Duct
4. Corridor ceiling partition
5. #10 screw
6. Duct/Sleeve Connection

Note: Damper can be installed with actuator on top of or below the ceiling partition.

FRAMING DETAILS

Steel Stud Construction

24" C-C (610) Max.

Steel Studs
Stl. Runner

2 Sheet Metal Screws

5/16" Min. U.L. Classified Drywall Typ. Both Sides Attach with Drywall Screws 12" C-C

Cut Flanges, Bend Web Down & Secure to Runner w/2 Sheet Mtl. Screws (Typ)
INSTALLATION INSTRUCTIONS
MODEL FSDR25C and FSDR25SSC ROUND CORRIDOR DAMPER
CLASSIFIED UL555 1 HOUR UL555S CLASS 1

APPLICATION
The FSDR25(SS)C is a true round corridor damper designed for installation in the ceiling penetration of "tunnel type" corridors constructed from metal studs. The FSDR25(SS)C is designed to fail close upon loss of power.

DAMPER SIZES
6" (152), 8" (203), 10" (254) and 12" (305) diameter.

GENERAL INSTALLATION

1. Ceiling Construction
The minimum ceiling partition construction will consist of metal studs on 24" (610) center to center. UL classified 5/8" (16) gypsum will be attached to the studs with 11/8" (29) drywall screws at 12" (305) centers.

2. Opening Clearance
A square opening in metal stud ceiling partition shall be a minimum of 1" (25) and a maximum of 2 1/2" (64) larger than the damper diameter.
THE RETAINING "CINCH" PLATE MUST OVERLAP THE OPENING A MINIMUM OF 1/2" (13).

3. Damper Sleeve
The sleeve is integral to the damper and shall be of equal to or heavier than the gage of the duct as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.

4. Damper Orientation
The leading edge of the blade in the closed position must be within the plane of the ceiling partition.

5. Retaining "Cinch" Plates
DO NOT PLACE CINCH PLATES IN GROOVE
The retaining "cinch" plates are designed to grab and hold the sleeve while mounting flush against the ceiling partition retaining the damper securely in the opening. The plates must overlap the opening a minimum of 1/2" (13) (see "Cinch" Plate section).

The "Cinch" plates are fastened to the wall or floor according to the following:
• Metal Stud Ceiling Partition – "Cinch" plate required on both sides of the partition fastened to the partition by engaging the metal stud a minimum of 1/2" (13) with a #10 screw.

6. Duct/Sleeve Connections
Round break-away connections must be used. Either a 4" (102) wide drawband or #10 sheet metal screws spaced equally around the circumference of the ducts as follows:
• Duct diameters 22" (559) and smaller – 3 screws.
Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer's instructions:
Hardcast, Inc. - Iron Grip 601
Precision - PA2084T
ECO Duct Seal 44-52
Design Polymerics – DP 1010.

7. Actuator Connections
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

8. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire/smoke damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions of NFPA 90A, 92A, UL864, local codes and in accordance with actuator manufacturer recommendations. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:
• TS150 FireStat for "Reopenable" Combination Fire and Smoke Dampers
• SP100 Switch Package
• EFL Electric Resettable Link
• EFL/SP100 Electric Resettable "Fuse" Link and Switch Package
• PFL Pneumatic Fuse Link

Dimensions shown in parentheses ( ) indicate millimeters.

RETAINING "CINCH" PLATES

Note:
Diameter + 6" (152) = plate size

Minimum Overlap of opening

SEE COMPLETE MARKING ON PRODUCT
GENERAL INSTALLATION

Figure 1

Figure 2

ITEM          DESCRIPTION
1. FSDR25C Round Corridor Damper
2. Retaining "cinch" Plate, 20 ga. steel (one plate required on each side of ceiling partition)
3. Duct
4. Corridor ceiling partition
5. #10 screw
6. Duct/Sleeve Connection

Note: Damper can be installed with actuator on top of or below the ceiling partition.

FRAMING DETAILS

Steel Stud Construction

24" C-C (610) Max.

Steel Studs

2 Sheet Metal Screws

Cut Flanges, Bend Web Down & Secure to Runner w/2 Sheet Mtl. Screws (Typ)

16" (406) Max.

Stl. Runner

6" (152) Max.

5/16" Min. U.L. Classified Drywall Typ. Both Sides Attach with Drywall Screws 12" C-C
**DFSDR1 CORRIDOR FIRE SMOKE DAMPER**

Lay-in DIFFUSER CORRIDOR DAMPER

UL555 and UL555S LEAKAGE 1, 1 HR. Rating

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**APPLICATION**

The DFSDR1 is two dampers in one. DFSDR1 is a one hour fire rated, UL labeled Corridor Damper leakage class 1 that is designed to be used in ceiling openings of wood stud or metal stud constructed interior tunnel corridors. The DFSDR1 is classified as a ceiling damper with a one hour fire resistance rating (See DFSDR1 in the Ceiling Fire Damper).

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**FEATURES**

- Corridor dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

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**ACTUATORS/ HEAT SENSOR DEVICE**

- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

---

**OPTIONS**

- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for re-openable operation in dynamic smoke management systems.
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.

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**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Blade Seal</th>
<th>Leakage Class</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFSDR1</td>
<td>20 gage (1.0) galvanized steel 12&quot; (305) long</td>
<td>Two piece 14 gage (1.3) equivalent thickness galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type sandwich between two piece blades. Full circumference smoke seal to 450°F (232°C).</td>
<td>1</td>
<td>1 Hour Corridor</td>
</tr>
</tbody>
</table>

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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFSDR1</td>
<td>6&quot; Dia. (152)</td>
<td>12&quot; Dia. (305)</td>
</tr>
</tbody>
</table>

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**APPENDIX**

Model DFSDR1 series meets the requirements for combination fire and smoke dampers established by:

- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3235-0245:0114)
- New York City (MEA 252-05-E)
APPLICATION

The DFSDR1 is a true round combination fire/smoke dampers designed for installation in the ceiling penetration of "tunnel type" corridors constructed from metal studs. The DFSDR1 may be installed on the neck of any diffuser, and is designed to fail close upon loss of power.

DAMPER SIZES

6" (152), 8" (203), 10" (254) and 12" (305) diameter.

GENERAL INSTALLATION

1. Ceiling Construction

The minimum ceiling partition construction will consist of metal studs on 24" (610) center to center. UL classified 5/8" (16) gypsum will be attached to the studs with 1 1/8" (29) drywall screws at 12" (305) centers.

2. Diffuser or Grille

The steel diffuser or grille, minimum 24 gage (.6) is supplied by others and is sized to overlap on the bottom edges of the ceiling partition opening a minimum of 3/4" (19) and fit snugly against the ceiling material. The damper must be fastened to the diffuser or grille using No. 8 (M4) screws, 3/16" (5) tubular steel rivets, or 1/4" (6) minimum tack welds spaced 6" (152) O.C. Use a minimum of three screws, rivets or welds equally spaced.

3. Mounting Angles

The mounting angles shall be 1 1/2" x 1 1/2" x 16 ga. (38 x 38 x 1.6) (min.) by 27 1/2" (674) long and shall be secured to the top of the ceiling rated partition with No. 8 x 1 5/8" (M4 x 41) screws, one placed at each end of the angle (minimum). Screws must penetrate metal studs. The damper frame will then be secured at the center to the mounting angles by No. 8 (M4) sheet metal screws, two per side.

4. Damper Sleeves

The 20 gage (.9) sleeve is integral to the damper and shall be equal to or heavier than the gage of the duct connecting as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.

5. Duct Connections

Round break-away connections must consist of a steel clamp, 16 gage (1.6) steel wire or 3 - #10 sheet metal screws spaced equally around the circumference of the duct. If flex duct is used the connections shall be a steel clamp, plastic strap or minimum 18 gage steel wire.

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

- Hardcast Inc. – Iron Grip 601
- Precision – PA2084T
- Eco Duct Seal 44-52
- Design Polymeric – DP 1010

6. Actuator Connection

Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be installed so it is round and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or actuators. Each fire/smoke dampers should be examined on a regular basis to ensure it is not rusted or blocked. It is recommended the damper be operated (the actuator cycled) at least once every 6 months. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instruction supplements for special requirements.

- Motor Operated TS150 FireState System with High Limit Temperature Sensor
- Motor Operated EFL Electric Resettable Link
- PFL Pneumatic Fuse Link
- SP100 on Fire and Leakage Rated Dampers

ITEM DESCRIPTION

1. Actuator (location may vary)
2. Flex Conduit
3. TS150 FireStat, EFL (electric fuse link) or PFL (pneumatic fuse link) (location may vary)
4. Integral Sleeve Damper Frame
5. Steel Surface Mount Ceiling Diffuser (supplied by others)
6. Mounting Angles and Fasteners
7. Duct (Flexible or Hard)
STEEL STUD CONSTRUCTION

Cut stl. runner web & secure to stl. stud w/2 sheet mtl. screws (Typ.)

Stl. Runner

Stl. Studs

24" (610 max. C-C)

5/8" (16) UL Classified drywall min. attach with drywall screws 12" (305) c-c
Smoke dampers are low leak damper and actuator assemblies constructed to restrict the spread of smoke in HVAC systems that are designed to be automatically shut down in the event of a fire, or open to control the movement of smoke within a building when the HVAC system is part of an engineered smoke control system.

Smoke dampers are tested and labeled in accordance with UL555S.

Smoke Damper Selection
The process of selecting a smoke damper involves the following considerations:
1. Leakage Rating – Classes 1, 2, or 3.
2. Elevated Temperature Rating – 250°F or 350°F
3. Operational Ratings – 2,000 fpm, 3,000 fpm or 4,000 fpm and 4 in. w.g., 6 in. w.g. or 8 in.
4. Blade Design – Airfoil or triple v-groove.

Leakage Rating
UL Standard 555S identifies four leakage classes as follows:

<table>
<thead>
<tr>
<th>Leakage Class</th>
<th>@4&quot; w.g.</th>
<th>@8&quot; w.g.</th>
<th>@12&quot; w.g.</th>
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<tbody>
<tr>
<td>Class I</td>
<td>8</td>
<td>11</td>
<td>14</td>
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<tr>
<td>Class II</td>
<td>20</td>
<td>28</td>
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<tr>
<td>Class III</td>
<td>80</td>
<td>112</td>
<td>140</td>
</tr>
</tbody>
</table>

HVAC system designers are advised to select the lowest leakage class damper. However, there are some smoke control applications when a higher leakage class damper is acceptable.

Elevated Temperature and Operational Rating
Under ambient airflow temperature the damper is cycled (open/closed) three times @ 4" w.g., then returned to full-open position where heat is introduced at an average temperature rise of 30º to 50ºF (17º to 28ºC) per minute until the specified elevated temperature of 250º F (121ºC) is attained. The system shall maintain the elevated temperature of up to a maximum 50ºF (28ºC) above specified elevated temperature for a minimum of 15 minutes. At that time damper is to be fully closed and then fully opened using the actuator. Cycle times shall not exceed 75 seconds for both opening and closing. Minimum operational rating is 2000 fpm (10.2 m/s) @ 4" w.g. (1.0 kPa) and 250ºF (121ºC). Other higher ratings that may be desired are conducted in increments of 1000 fpm and/or increments of 2" w.g. and up to 350ºF.

Smoke Damper Installation
The smoke damper must be installed no more than 24” from the smoke barrier it is intended to protect.

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**SMOKE DAMPERS MODELS**

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<tr>
<th>MODEL</th>
<th>HOURLY RATING</th>
<th>LEAKAGE CLASS</th>
<th>BLADE TYPE/DESCRIPTION</th>
<th>MAXIMUM VELOCITY* (FPM)</th>
<th>MAXIMUM PRESSURE* (IN. W.G.)</th>
<th>MAXIMUM ASSEMBLY TEMP. ºF*</th>
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<td>Airfoil</td>
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<td>I</td>
<td>V-Groove</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>SD36</td>
<td>NA</td>
<td>II</td>
<td>V-Groove</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>SD35</td>
<td>NA</td>
<td>III</td>
<td>V-Groove</td>
<td>2000</td>
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</tr>
<tr>
<td>SDRS25</td>
<td>NA</td>
<td>I</td>
<td>True Round</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>SD37SS</td>
<td>NA</td>
<td>I</td>
<td>V-Groove</td>
<td>2000</td>
<td>4</td>
<td>350</td>
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<tr>
<td>SD36SS</td>
<td>NA</td>
<td>II</td>
<td>V-Groove</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>SD35SS</td>
<td>NA</td>
<td>III</td>
<td>V-Groove</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>SDRS25SS</td>
<td>NA</td>
<td>I</td>
<td>True Round</td>
<td>2000</td>
<td>4</td>
<td>350</td>
</tr>
<tr>
<td>SD60M</td>
<td>NA</td>
<td>I</td>
<td>Airfoil</td>
<td>2000</td>
<td>4</td>
<td>250</td>
</tr>
<tr>
<td>SD60-BAL</td>
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<td>I</td>
<td>Airfoil</td>
<td>2000</td>
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<td>250</td>
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<tr>
<td>SD102</td>
<td>NA</td>
<td>II</td>
<td>Airfoil</td>
<td>2000</td>
<td>6</td>
<td>250</td>
</tr>
</tbody>
</table>

*For metric units, please see back cover.

**SMOKE DAMPERS**
Applic.

Ruskin SDRS25 and SDRS25SS “true round” low leak single blade smoke dampers provide point-of-origin smoke containment. The SDRS series is the ideal choice when round duct is used on a project. SDRS series dampers may be installed vertically or horizontally, and is rated for airflow and leakage in either direction. The SDRS25 series are rated for velocity up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

**FEATURES**
- Smoke dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

**options**
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF Duct Smoke Detector.
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.

Model SDRS series meets the requirements for smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal - Listing (#3230-0245:0108)
- New York City (MEA 252-05-E)

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Blade Seal</th>
<th>Leakage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDRS25</td>
<td>20 gage (.9) galvanized steel. Standard 17” (432) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).</td>
<td>1</td>
</tr>
<tr>
<td>SDRS25SS</td>
<td>20 gage (.9) 304 stainless steel. Standard 17” (432) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness 304 stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).</td>
<td></td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDRS25, SDRS25SS</td>
<td>6” Dia. (152)</td>
<td>24” Dia. (609)</td>
</tr>
</tbody>
</table>
**SD50 Aluminum Smoke Dampers**

High Performance/Ultra-low

UL555S Classified leakage Class 1

---

**Application**

Ruskin SD50 ultra low leak smoke dampers are used in ducts that penetrate smoke rated barriers or partitions. The high strength, one-piece extruded aluminum airfoil blades to ensure the lowest resistance to airflow and leakage up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa). All SD50 series dampers may be installed vertically (with blades running horizontal) or horizontally, and are rated for airflow and leakage in either direction.

---

**FEATURES**

- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Available power "open" spring close or power "close" and spring open.
- Smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/HEAT SENSOR DEVICE**

- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.

**OPTIONS**

- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

---

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD50</td>
<td>5&quot; x 1&quot; (127 x 25) 6063T5 extruded aluminum, hat-shaped channel. .125&quot; minimum wall thickness</td>
<td>One-piece extruded aluminum, airfoil shape, 6&quot; (152) wide. Blades are approximately 6&quot; (152) on center.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
</tr>
</tbody>
</table>

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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD50</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>144&quot;w x 96&quot;h (3658 x 2438)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>288&quot;w x 48&quot;h (7315 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>72&quot;w x 192&quot;h (1829 x 4877)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
SD60 and SD60-2 Galvanized Smoke Dampers
HiGH Performance/Ultra-low Leakage
UL555S Classified Class 1 and 2

Application
Ruskin SD60 Series ultra low leak smoke dampers are used in ducts that penetrate smoke rated barriers or partitions. The high strength, one-piece, airfoil blades ensure the lowest resistance to airflow and leakage up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa). All SD60 series dampers may be installed vertically (with blades running horizontal) or horizontally, and are rated for airflow and leakage in either direction.

FEATURES
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Available power “open” spring close or power “close” and spring open.
- Smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

ACTUATORS/ HEAT SENSOR DEVICE
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.

OPTIONS
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

Model SD60 series meets the requirements for smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal - Listing (#3230-0245:0131)
- New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
</tr>
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<tbody>
<tr>
<td>SD60</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>1</td>
</tr>
<tr>
<td>SD60-2</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD60</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>144&quot;w x 96&quot;h (3658 x 2438)</td>
</tr>
<tr>
<td>SD60-2</td>
<td></td>
<td></td>
<td>288&quot;w x 48&quot;h (7315 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>72&quot;w x 192&quot;h (1829 x 4877)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
Ruskin SD60V Series ultra low leak smoke dampers are used in ducts that penetrate smoke rated barriers or partitions. The SD60V is UL listed with the blades running either horizontally or vertically. This is the perfect choice for applications where ducts run side by side and there is no room for actuators on the side of the dampers. The high strength, one-piece, airfoil blades ensure the lowest resistance to airflow and leakage up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa). All SD60 series dampers may be installed vertically (with blades running horizontal) or horizontally, and are rated for airflow and leakage in either direction.

**FEATURES**
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Available power “open” spring close or power “close” and spring open.
- Smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.

**OPTIONS**
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

Model SD60V series meets the requirements for smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3230-0245:0131)
- New York City (MEA 252-05-E)

### SPECIFICATIONS

<table>
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<tr>
<th>Damper</th>
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<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
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</thead>
<tbody>
<tr>
<td>SD60V</td>
<td>5” x 16 gage galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil nominal 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
<td>2</td>
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### MAXIMUM UL CLASSIFIED DAMPER SIZES

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<th>Damper</th>
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</thead>
<tbody>
<tr>
<td>SD60V</td>
<td>6”w x 8”h (152 x 203)</td>
<td>48”w x 36”h (1219 x 914)</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Ruskin SD36 Series low leak smoke dampers are used in ducts that penetrate smoke rated barriers or partitions. The SD36 series damper is constructed with V-Groove blades for velocities up to 2,000 fpm (10.2 m/s) and 4" w.g. (1 kPa). All SD36 series dampers may be installed vertically (with blades running horizontal) or horizontally, and are rated for airflow and leakage in either direction.

**FEATURES**
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.

**OPTIONS**
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

Model SD36 series meets the requirements for smoke dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3230-0245:0131)
- New York City (MEA 252-05-E)

### SPECIFICATIONS

<table>
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<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD35</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>16 (1.6) gage galvanized steel, triple V-Groove shaped.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td>Concealed in frame.</td>
<td>3</td>
</tr>
<tr>
<td>SD36</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>16 (1.6) gage galvanized steel, triple V-Groove shaped.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td>Concealed in frame.</td>
<td>2</td>
</tr>
<tr>
<td>SD37</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>16 (1.6) gage galvanized steel, triple V-Groove shaped.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td>Concealed in frame.</td>
<td>1</td>
</tr>
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### MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
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<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD35</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>144&quot;w x 96&quot;h (3658 x 2438)</td>
</tr>
<tr>
<td>SD36</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>288&quot;w x 48&quot;h (7315 x 1219)</td>
</tr>
<tr>
<td>SD37</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>72&quot;w x 192&quot;h (1829 x 4877)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
Ruskin SD36SS Series low leak smoke dampers are used in ducts that penetrate smoke rated barriers or partitions. The SD36 series damper is constructed with V-Groove stainless steel blades for velocities up to 2,000 fpm (10.2 m/s) and 4" w.g. (1 kPa). All SD36SS series dampers may be installed vertically (with blades running horizontal) or horizontally, and is rated for airflow and leakage in either direction.

**FEATURES**
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C).
- Factory mounted electric or pneumatic actuators
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.

**OPTIONS**
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

**Application**
Ruskin SD36SS Series low leak smoke dampers are used in ducts that penetrate smoke rated barriers or partitions. The SD36 series damper is constructed with V-Groove stainless steel blades for velocities up to 2,000 fpm (10.2 m/s) and 4" w.g. (1 kPa). All SD36SS series dampers may be installed vertically (with blades running horizontal) or horizontally, and is rated for airflow and leakage in either direction.

Model SD36SS series meets the requirements for dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3230-0245:0131)
- New York City (MEA 252-05-E)

**SPECIFICATIONS**

<table>
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<tr>
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<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD35SS</td>
<td>5&quot; x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>16 (1.6) gage stainless steel, triple V-Groove shaped.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td>Concealed in frame.</td>
<td>3</td>
</tr>
<tr>
<td>SD36SS</td>
<td>5&quot; x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>16 (1.6) gage stainless steel, triple V-Groove shaped.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td>Concealed in frame.</td>
<td>2</td>
</tr>
<tr>
<td>SD37SS</td>
<td>5&quot; x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel</td>
<td>16 (1.6) gage stainless steel, triple V-Groove shaped.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>N/A</td>
<td>Concealed in frame.</td>
<td>1</td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD35</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>144&quot;w x 96&quot;h (3658 x 2438)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>288&quot;w x 48&quot;h (7315 x 1219)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>72&quot;w x 192&quot;h (1829 x 4877)</td>
</tr>
<tr>
<td>SD36</td>
<td></td>
<td></td>
<td>192&quot;w x 32&quot;h (4877 x 813)</td>
</tr>
<tr>
<td></td>
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<td>96&quot;w x 64&quot;h (2438 x 1626)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>48&quot;w x 128&quot;h (1219 x 3251)</td>
</tr>
<tr>
<td>SD37</td>
<td>12&quot;w x 6&quot;h (305 x 152)</td>
<td>24&quot;w x 32&quot;h (610 x 813)</td>
<td>192&quot;w x 32&quot;h (4877 x 813)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>96&quot;w x 64&quot;h (2438 x 1626)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>48&quot;w x 128&quot;h (1219 x 3251)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
**Application**

Ruskin SD60M ultra low leak smoke dampers provide point-of-origin smoke containment. The SD60M is equipped with either a modulating electric or pneumatic actuator so it can be used as a volume control damper.

Ruskin SD60-BAL ultra low leak smoke dampers provide point-of-origin smoke containment. The SD60-BAL is equipped with a 24VAC/VDC actuator with built in potentiometer that allows the damper to open to numerous positions and still drive full open for smoke control purposes.

All Smoke dampers may be installed vertically in walls, or horizontally in masonry floors, and are rated for airflow and leakage in either direction.

**FEATURES**

- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Smoke dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**

- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Actuators available for either external (out of air stream) or internal (in air stream) mounting location.

**OPTIONS**

- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- DSDF/DSDN Duct Smoke Detector (Flow rated and No-Flow).
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.

Model SD60M and SD60-BAL meets the requirements for dampers established by:
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** - Listing (#3230-0245:0131)
- **New York City** (MEA 252-05-E)

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD60M</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) and galvanized steel for flame seal to 1900°F (1038°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame.</td>
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<td>SD60-BAL</td>
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### MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
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<tbody>
<tr>
<td></td>
<td>Vertical or Horizontal</td>
<td>Vertical or Horizontal**</td>
<td></td>
</tr>
<tr>
<td>SD60M</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>120&quot;w x 48&quot;h (3048 x 1219) or 64&quot;w x 96&quot;h (1626 x 2438)</td>
</tr>
<tr>
<td>SD60-BAL</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
Smoke dampers are designed to be vertically or horizontally installed, in accordance with NFPA90A, at or adjacent to the point where the duct passes through the smoke barrier. In no case shall the damper be installed with an outlet or inlet between the smoke barrier and the damper or more than 24" (610) from the smoke barrier. Smoke dampers are operated with electric or pneumatic actuators that either power open (spring closed) or power closed (spring open).

SD35 and SD36 MAXIMUM UL CLASSIFIED SIZE – OPPOSED AND PARALLEL BLADE
- Single Section (only) Vertical or Horizontal Installation – 36"w x 72"h (914 x 1829)
- Multiple Section Assembly Vertical or Horizontal Installation – 144"w x 96"h (3658 x 2438) or 288"w x 48"h (7315 x 1219) or 72"w x 192"h (1829 x 4877)

SD37, SD60, SD60-2, and SD50 MAXIMUM UL CLASSIFIED SIZE – OPPOSED AND PARALLEL BLADE
- Single Section (only) Vertical or Horizontal Installation – 48"w x 72"h (1219 x 1829)
- Multiple Section Assembly Vertical or Horizontal Installation – 144"w x 96"h (3658 x 2438) or 288"w x 48"h (7315 x 1219) or 72"w x 192"h (1829 x 4877)

SD35SS and SD36SS MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADES
- Single Section (only) Vertical or Horizontal Installation – 36"w x 48"h (914 x 1219)
- Multiple Section Assembly Vertical or Horizontal Installation – 144"w x 96"h (3658 x 2438) or 288"w x 48"h (7315 x 1219) or 72"w x 192"h (1829 x 4877)

SD37SS MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADES
- Single Section (only) Vertical or Horizontal Installation – 24"w x 36"h (610 x 914)
- Multiple Section Assembly Vertical or Horizontal Installation – 96"w x 64"h (2438 x 1625) or 192"w x 32"h (4877 x 813) or 48"w x 128"h (1219 x 3251)

SD60V MAXIMUM UL CLASSIFIED SIZES – OPPOSED BLADES
- Single Section (only) Vertical or Horizontal Installation – 48"w x 36"h (1219 x 914)

SDRS25 and SDRS25SS MAXIMUM UL CLASSIFIED SIZES –
- Single Section (only) Vertical or Horizontal Installation – 24" (610) diameter.

Dimensions shown in parentheses ( ) indicate millimeters.
1. Location of Damper in Ductwork
Smoke Dampers must be placed in the ductwork so the closed blades are within 24" (610) of the smoke barrier and before any duct inlets or outlets (access doors not included).

2. Fasteners and Multiple Section Assembly
When joining multiple damper assemblies or fastening the damper to the ductwork, dampers shall be fastened with 1/4"-20 (M6) bolts, #10 (M5) screws, 1/2" (13) long welds or 3/16" tubular steel rivets. Fasteners shall be spaced a maximum of 12" (305) center to center with a minimum of two fasteners per side.

3. Sealing the Installation
Smoke dampers must be sealed between the damper frames (when joining multiple sections to form an assembly) and between the damper frame and ductwork. Seal the above joints using Dow-Corning Silastic 732 RTV or GE RTV 108. The sealant shall be pressed in place to dispel any air and shall be applied to one side of the damper's face. Use the minimum amount of material to completely seal the joint.

4. Actuator Connections
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations. Multiple section or single section dampers utilizing more than one actuator require all actuators to be connected to a single (common) point for simultaneous operation (closure).

5. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Ruskin recommends that each smoke damper be maintained, cycled and tested every six months and in accordance with the latest editions of NFPA90A, 92A, UL864, local codes and in accordance with actuator manufacturer's recommendations. Care should be exercised to ensure that tests are performed safely and do not cause system damage.

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**ITEM**

1. Damper
2. Duct or Sleeve
3. Smoke Barrier
4. Duct Outlet
5. No. 8 (Minimum) Fastener
6. Caulking Material
7. Caulking or fire stopping as required by building code.
8. Operator / Actuator
9. Flanged Duct or Bulkhead

---

**SDRS25 and SDRS25SS**
Single Blade Round Smoke Damper
Installed within a Duct or Sleeve

**SD35, SD36, SD37, SD50, SD60, SD60-2**
SD35SS, SD36SS and SD37SS
Multiple Blade Smoke Damper
Installed within a Duct or Sleeve

**SD35, SD36, SD37, SD50, SD60, SD60-2**
SD35SS, SD36SS and SD37SS
Multiple Blade Smoke Damper
Installed within a Flanged Frame or Flanged Sleeve
Ruskin SD102 UL555S Leakage Class 2a smoke damper used in ducts that penetrate smoke rated barriers, partitions or fans and is designed for air-handling equipment isolation. The SD102 is manufactured with one piece extruded aluminum airfoil blades and formed galvanized steel frame. All SD102 series dampers may be installed vertically (with blades running horizontal) or horizontally, and is rated for airflow and leakage in either direction. The SD102 is UL listed for 2,000 fpm, and 6" w.g. (1.5 kPa), but is constructed and tested for velocities as high as 5,000 fpm and pressures as high as 24" w.g. (6 kPa).

**FEATURES**
- Dampers are AMCA Licensed and the product literature shall bear the AMCA certified rating seal for air performance.
- Available power "open" spring close or power "close" and spring open.
- Smoke dampers are produced in an ISO 9001 certified factory
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS**
- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators

**OPTIONS**
- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.

Model SD102 meets the requirements for smoke dampers established by:
- ICC International Building Codes

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Jamb Seal</th>
<th>Blade Seal</th>
<th>Linkage</th>
<th>Leakage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD102</td>
<td>8&quot; x 2&quot; x 12 gage (203 x 51 x 2.8) galvanized steel channel</td>
<td>7¾&quot; wide, .080 (2.1) thick, 6063T6 extruded aluminum airfoil blade.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Stainless steel, flexible metal compression type.</td>
<td>Silicone edge type for smoke seal to 450°F (232°C) mechanically fastened to the blade edge.</td>
<td>Concealed in frame</td>
<td>2</td>
</tr>
</tbody>
</table>

### MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD102</td>
<td>12&quot;w x 6&quot;h (305 x 152)</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
<td>72&quot;w x 48&quot;h (1829 x 1219)</td>
</tr>
</tbody>
</table>
**SMOKE BARRIER APPLICATION**

Leakage rated dampers are designed to operate with blades running horizontally. Dampers can be vertically or horizontally installed, in accordance with NFPA-90A, at or adjacent to the point where the duct passes through the smoke barrier. In no case shall the damper be installed more than 24" (610) from the smoke barrier or after the first duct or outlet.

**FAN ISOLATION APPLICATION**

For air handling equipment isolation, leakage rated dampers are designed to operate with blades running horizontally. In accordance with the latest edition of NFPA-90A, dampers can be installed in a vertical or horizontal position and can be attached to the fan system discharge or inlet without being with 24" (610) of a smoke barrier when used as an air handling equipment isolation damper.

**GENERAL INSTALLATION**

To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Ruskin recommends that each smoke damper be maintained, cycled and tested every six months and in accordance with the latest editions of NFPA90A, 92A, UL864, local codes and in accordance with actuator manufacturer's recommendations. Care should be exercised to ensure that tests are performed safely and do not cause system damage. The damper is flange mounted to the duct, sleeve, or wall opening with 3/8" (10) minimum diameter bolts. All fastenings must be spaced a maximum of 6" (152) apart, center to center, with a minimum of two fastenings per side. Dampers can be attached directly to fan, if required.

Note that SD102 dampers are not recommended for use in abrasive atmospheres. Consult your Ruskin representative for a listing of Ruskin models suited to abrasive environments.

**ITEM DESCRIPTION**

1. Damper Frame
2. Duct Outlet
3. Fan
4. 3/8" (10) minimum diameter Bolts
5. Operator/Actuator

Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations. Multiple section or single section dampers utilizing more than one actuator require all actuators to be connected to a single (common) point for simultaneous operation (closure).

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**Note:** Dimensions shown in parentheses ( ) indicate millimeters.
Fire dampers are UL555 tested and labeled devices installed in ducts and air transfer openings of air distribution systems, designed to close upon the detection of heat. Fire dampers, when closed interrupt migratory airflow, resist the passage of flame and maintain the integrity of the fire rated barrier.

Fire Damper Selection
The process of selecting a fire damper involves the following considerations:

Fire Resistance Rating
Fire dampers are typically rated for 1-1/2 or 3 hours fire resistance. A 1-1/2 rated damper is sufficient for wall or floors having a rating of less than 3 hours. If the wall or floor has a rating of 3 hours or more, a 3 hour rated damper is required for sufficient protection. (IBC Chapter 7 and NFPA90A Chapter 5).

Dynamic Closure Rating
Fire dampers are rated for either static (fans off) or dynamic (fans on) HVAC systems. Static fire dampers have not been tested for closure under airflow and therefore can only be applied in HVAC systems that are designed to shut down in the event of a fire. Dynamic fire dampers have been tested for closure under airflow and carry both an airflow velocity (fpm) and pressure differential (w.g) rating. Minimum operational rating is 2000 fpm and 4” w.g. Other higher ratings that may be desired are conducted in increments of 1000 fpm and/or increments of 2” w.g. A dynamic fire damper should be selected based on the conditions it will operate in after installation.

Installation
Fire dampers can be installed in the floor (horizontal) with vertical airflow or they can be installed in walls (vertical) with horizontal airflow.

The damper blades must close within the plane of the rated barrier, unless an “out of wall/floor” fire damper model is used.

Fire dampers use a variety of spring mechanisms depending on size, rating and vertical or horizontal mounting. So, it is important to recognize that dampers must be ordered according to their installed position for proper operation and features. For a wall opening the damper orientation is vertical mount, and a floor opening the damper orientation is horizontal mount.

Damper Type
There are two main types of fire dampers: curtain type and multiple blade type. The curtain blade is the most commonly used fire damper because it costs less than the multiple blade type and, in most cases, is less restrictive to the air flow. Multiple blade fire dampers, however, are available in larger sizes and can be easier to test and re-open. Dynamic multiple blade fire dampers are airflow closure rated for higher velocities and pressures than curtain type fire dampers.
# FIRE DAMPER MODELS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>HOURLY RATING</th>
<th>BLADE TYPE/DESCRIPTION</th>
<th>MAXIMUM VELOCITY** (FPM)</th>
<th>MAXIMUM PRESSURE* (IN. W.G.)</th>
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</thead>
<tbody>
<tr>
<td><strong>Dynamic 1-1/2 Hour Fire Dampers</strong></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Standard</td>
<td></td>
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</tr>
<tr>
<td>DFD60</td>
<td>1-1/2</td>
<td>Airfoil Multi-blade</td>
<td>4000</td>
<td>8</td>
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<tr>
<td>DIBD2</td>
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<td>Triple V-Groove Multi-blade</td>
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<td></td>
<td></td>
<td>Integral Access Door</td>
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<tr>
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<td>Curtain type, Factory Sleeve</td>
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<td>4</td>
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<td></td>
<td></td>
<td>Grille &amp; Grille Access</td>
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<td>DIBD2GA</td>
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<td>1-1/2</td>
<td>True Round</td>
<td>2000</td>
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<td></td>
<td>Stainless Steel</td>
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<tr>
<td>DFD35SS</td>
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<td>Triple V-Groove Multi-blade</td>
<td>2000</td>
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<td>DFD35SSOW</td>
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<td>Triple V-Groove Multi-blade, Out of wall/floor, Factory Sleeve</td>
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<tr>
<td>DFD35SSGA</td>
<td>1-1/2</td>
<td>Triple V-Groove Multi-blade, Out of wall/floor, Factory Sleeve</td>
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<td><strong>Dynamic 3 Hour Fire Dampers</strong></td>
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<td>DIBD630</td>
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<td>4000</td>
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</table>
Ruskin FDR25 and FDR25SS "true round" fire dampers provide point-of-origin fire containment. The FDR25 series is the ideal choice when round duct is used on a project. FDR25 series dampers may be installed vertically in walls, or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours, and are rated for airflow and leakage in either direction. The FDR25 are rated for velocity up to 3000 fpm (15.2 m/s) and 4 in. wg (1 kPa). The integral frame and unique “Cinch Plate” design provides a low cost, easy to install, high performing damper.

FEATURES
• Fire dampers are produced in an ISO 9001 certified factory.

OPTIONS
• FM Approvals as Specification Tested Product.

Model FDR25 series meets the requirements for fire dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal Listing (#3225-0245-0115)
• New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDR25</td>
<td>20 gage (.9) galvanized steel. Standard 17&quot; (432) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>1 1/2</td>
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<tr>
<td>FDR25SS</td>
<td>20 gage (.9) 304 stainless steel. Standard 17&quot; (432) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness 304 stainless steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
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</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDR25, FDR25SS</td>
<td>6&quot; Dia. (152)</td>
<td>24&quot; Dia. (609)</td>
</tr>
</tbody>
</table>
INSTALLATION INSTRUCTIONS
FDR25 AND FDR25SS ROUND FIRE DAMPER
1 1/2 HOUR UL555 RATED

APPLICATION
The FDR25(SS) are “true” round, single blade dampers. They are designed for use with round duct and the openings may be square or round. The standard installation is with the leading edge of the closed blade within the walls, partitions or masonry floors; with fire resistance rating of less than 3 hours. Installation may be obtained with the “CINCH” plate on one side for metal stud or masonry walls and “CINCH” plate both sides for wood stud wall and masonry floors.

MOUNTING
Vertical or horizontal.

MINIMUM SIZE
6” (152) diameter.

MAXIMUM UL CLASSIFIED SIZE
24” (610) diameter.

Dimensions shown in parenthesis ( ) indicate millimeters.

RETAINING "CINCH" PLATES (see section 4)

1. Expansion Gap
A square opening in wood or metal stud walls or masonry walls and floors shall be a minimum of 1” (25) and a maximum of 2 1/2” (64) larger than the damper diameter. A round opening in masonry walls or floors shall be a minimum of 1” (25) and a maximum of 2 1/2” (64) larger than the damper diameter.

The RETAINING "CINCH" PLATE MUST OVERLAP THE OPENING A MINIMUM OF 1” (25).

2. Damper Sleeve
The sleeve is integral to the damper and shall be of equal to or heavier than the gage of the duct as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.

3. Damper Orientation
The leading edge of the blade in the closed position must be within the plane of the wall. Vertical installation is illustrated and horizontal is similar (see General Installation). The damper may be installed with up to a 30 degree variance of the axle being horizontal (see Blade Orientation section). Approved with airflow in any direction.

4. Retaining “Cinch” Plates
DO NOT PLACE CINCH PLATES IN GROOVE
Place retaining cinch plates around the damper sleeve and “cinch” against the sleeve with the screw provided on the cinching device (see “Cinch” Plate section). The plates are designed to grab and hold the sleeve while mounting flush against the wall or floor retaining the damper securely in the opening. The plates must overlap the opening a minimum of 1” (25) (see “Cinch” Plate section).

The “Cinch” plates are fastened to the wall or floor according to the following:
• Masonry Wall – “Cinch” plate required on only one side of the wall fastened to the wall with a minimum of 1 1/4” (6) #10 masonry screw.
• Masonry Floor – “Cinch” plate required on both sides of the floor fastened to the floor with a minimum of 1 1/4” (6) #10 masonry screw.
• Metal Stud Wall – “Cinch” plate required on only one side of the wall fastened to the wall by engaging the metal stud a minimum of 1/2” (13) with a #10 screw.
• Wood Stud Wall – “Cinch” plate required on both sides of the wall fastened to the wall by engaging the wood stud a minimum of 1 1/2” (38) with a #10 screw.

5. Duct/Sleeve Connections
Round break-away connections must be used. Either a 4” (102) wide drawband or #10 sheet metal screws spaced equally around the circumference of the ducts as follows:
• Duct diameters 22” (559) and smaller – 3 screws.
• Duct diameters over 22” (559) to 24” (610) – 5 screws.

Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer’s instructions: Hardcast, Inc. - Iron Grip 601, Precision - PA2084T, ECO Duct Seal 44-52 or Design Polymerics - DP 1010

6. Installation and Maintenance
Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blade. Each fire damper should be examined on a regular basis to ensure it is not rusted or blocked. Consult NFPA for recommendations on maintenance and testing intervals. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
GENERAL INSTALLATION

In 1 and 2 Hr. Rated Masonry Floors and Ceilings or Walls

ITEM DESCRIPTION
1. FDR25 Round Fire Damper
2. Retaining “Cinch” Plate, 20 ga. steel (only one plate is required on walls, as shown, and two plates are required on floors).
3. Duct
4. Masonry Wall or Floor
5. #10 Concrete Anchor, (min 1 1/4" (31) long
6. Duct/Sleeve Connection
7. Expansion Gap

Note: Masonry walls only require a “cinch” plate on one side of the wall. Masonry floors require a “cinch” plate on both top and bottom side of the floor.

Within Square Opening in Metal or Wood Stud Framed 1 and 2 Hr. Rated Drywall Partitions

ITEM DESCRIPTION
1. FDR25 Round Fire/Smoke Damper
2. Retaining “Cinch” Plate, 20 ga. steel (only one plate is required on metal stud walls, and two plates are required on wood stud walls).
3. Duct
4. Metal Stud Wall (plate required on only one side)
5. Wood Stud Wall (plate required on both sides)
6. Expansion Gap
7. Duct/Sleeve Connection
8. #10 Sheet Metal Screw (refer to section 4 for fastener requirements).

Note: Metal stud walls require retaining “cinch” plates on only one side of the wall. Wood stud walls require retaining “cinch” plates on both sides of the wall.
APPLICATION

Ruskin DFD-LP is a 1½ hour rated single aerodynamic blade Dynamic (Fan On) or Static (Fan Off) fire damper. DFD-LP is constructed with an integral sleeve/frame and an aerodynamic shaped blade for high velocity applications and is rated for 4,000 fpm and 4" w.g. on all sizes. The DFD-LP is also rated for dual direction air flow and can be installed vertically in walls or horizontally in masonry floors.

Model DFD-LP meets the requirements for fire dampers established by:
- ICC International Building Codes

FEATURES

- 14½" long integral sleeve/frame
- FAST single side mounting angel
- RUSK-INDICATOR - External mount blade position indicator
- Easy Reset Arm - To assist in testing to meet NFPA requirements

VELOCITY VS. PRESSURE DROP

DFD-LP - Curtain Fire Damper V/H Style B
8" Wide x 6" High

FACE VELOCITY - FEET/MINUTE
AMCA Fig. 5.3

PRESSURE DROP - INCHES W.G.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFD-LP</td>
<td>14½&quot; long integral sleeve/frame 20 (1.0) gage galvanized steel</td>
<td>Low profile aerodynamic shaped, double skin galvanized steel</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>1½</td>
</tr>
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MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFD-LP</td>
<td>6&quot; x 6&quot; (152 x 152)</td>
<td>24&quot; x 14&quot; (609 x 356)</td>
</tr>
</tbody>
</table>
**INSTALLATION INSTRUCTIONS**

**DFD-LP LOW PROFILE LOW PRESSURE DROP DYNAMIC RATED FIRE DAMPER**

1½ HOUR RATING FOR USE IN DYNAMIC AND STATIC SYSTEMS

---

**APPLICATION**

The DFD-LP dynamic fire damper is designed for use in dynamic (fans on) or static (fan off) systems. The dampers are designed to operate with the blades running horizontally. The standard application is with the leading edge of the closed blade within the wall or masonry floor.

**DYNAMIC FIRE DAMPERS**
Use in Dynamic (fans on) or Static (fans off) Systems

**DFD-LP MAXIMUM UL CLASSIFIED SIZES**
Single section vertical and horizontal installation
24"w x 14"h (610 x 356)

Dimensions shown in parentheses (   ) indicate millimeters.

---

**INSTALLATION SUPPLEMENTS**

Refer to the Ruskin installation instruction 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 installation
- Extension of Fire and Combination Fire and Smoke Damper Sleeves
- Fire and Combination Fire and Smoke Damper Installation in Concrete Floor with Steel Deck
- Flanged System Breakaway Connections
- Cavity Shaft Wall Metal Stud Framing
- SP100 Switch Package

---

**SEE COMPLETE MARKING ON PRODUCT**

© Ruskin 2014
1. Opening Clearance

The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation and expansion. For two angle installations the opening shall be a minimum of 1½" per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed ½" per foot (3 per 305) plus 2" (51), nor shall the opening be less than ½" (6) larger than the damper/sleeve assembly. For one angle installations, the opening shall be a minimum of 1½" (6) to a maximum of 1" (25) larger than the overall size of the damper/sleeve assembly.

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 ½" (13) long welds staggered intermittently on both sides. Space fasteners 8" (152) on center and a maximum 2" (51) from the ends of the joining sections or from each corner.

3. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 blades 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 the jackshaft above or below the floor.

5. Mounting Angles

Mounting angles shall be a minimum of 1½" x 1½" x 20 gage 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 wallboard on metal stud wall installations only. Larger openings 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

To sleeve #10 bolts or screws, 3/16" (5) 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 ⅜" (13). Screw fasteners used in wood stud must engage the wood stud a minimum of ¾" (19). Screw fasteners used in masonry walls or floors must engage the wall or floor a minimum of 11/2" (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:

- PLAIN "S" SLIP
- HEMBRED "S" SLIP
- DOUBLE "S" SLIP
- INSIDE SLIP JOINT
- STANDING S (ANGLE REINFORCED)
- STANDING S (ANGLE REINFORCED)
- STANDING S (ANGLE REINFORCED)
- DRIVE SLIP JOINT

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 4½" (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

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or jackshaft. Dampers must be maintained, cycled and tested in accordance with the latest editions of NFPA 60, 90A, 92A, 92B, 105, UL864, AMCA 503 and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
## VERTICAL INSTALLATION

![Diagram of Vertical Installation]

**TWO ANGLE INSTALLATION**

Angles are required on both sides of the partition.

**FAST ANGLE (ONE ANGLE) INSTALLATION**

Angle may be installed on either side of the partition.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fusible Link Assembly</td>
</tr>
<tr>
<td>2.</td>
<td>Damper Frame/Sleeve</td>
</tr>
<tr>
<td>3.</td>
<td>Mounting Angles</td>
</tr>
<tr>
<td>4.</td>
<td>Breakaway Connection</td>
</tr>
<tr>
<td>5.</td>
<td>Over-center Link</td>
</tr>
<tr>
<td>6.</td>
<td>Opening Clearance</td>
</tr>
</tbody>
</table>

## HORIZONTAL INSTALLATION

![Diagram of Horizontal Installation]

**UNITS WITH ONE ANGLE**

Top Side of Masonry Floor

Angles may be installed on the top of the floor.

**UNITS WITH ANGLE**

Both Sides Masonry Floor

Angles are required on both sides of the floor.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>4.</td>
<td>Breakaway Connection</td>
</tr>
<tr>
<td>5.</td>
<td>Over-center Link</td>
</tr>
<tr>
<td>6.</td>
<td>Opening Clearance</td>
</tr>
</tbody>
</table>
DIBD2 and DIBD2SS Dynamic Curtain Fire Dampers
UL555 Classified
1 ½ Hr. Rating

Application
Ruskin DIBD2(SS) series dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

FEATURES
• Dynamic fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES
• A Style – Frame and blades in the airstream
  o 75 to 85% free area
• B Style – Blades out of the airstream
  o 80 to 90% free area
  o Not air tight
• C Style – Blades and frame out of the airstream
  o Square or rectangular enclosure
  o 95 to 100% free area
  o Sealed assembly
• CR Style – Blades and frame out of the airstream
  o Round enclosure
  o 95 to 100% free area
  o Sealed assembly
• CO Style – Blades and frame out of the airstream
  o Oval enclosure
  o 95 to 100% free area
  o Sealed assembly

OPTIONS
• FM Approvals as Specification Tested Product.
• SP200 Switch Package to allow remote indication of damper blade position.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
• Welded Construction for BC, WC, WR and WO Transition Styles
• Fusible Links 165ºF (74ºC) is standard. 212ºF (100ºC) and 285ºF (141ºC) are optional

Model DIBD series meets the requirements for fire dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal
  Listing (#3225-0245:000) DIBD2 and DIBD2SS
• New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<tr>
<td>DIBD2</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
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<tr>
<td>DIBD2SS</td>
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<td>304 Stainless Steel (in gages required by UL listing R5531)</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section**</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DIBD2</td>
<td>4'w x 4'h</td>
<td>6'w x 6'h</td>
<td>33'w x 36'h (838 x 914)</td>
</tr>
<tr>
<td></td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(610 x 610)</td>
</tr>
<tr>
<td>DIBD2SS</td>
<td>24'w x 24'h</td>
<td>24'w x 24'h</td>
<td>72'w x 48'h (1829 x 1219)</td>
</tr>
<tr>
<td></td>
<td>(610 x 610)</td>
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<td>(2515 x 610)</td>
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** See product data sheets for more details on single and multiple section sizing.
IBD2 AND IBD2SS STATIC CURTAIN FIRE DAMPERS
UL555 CLASSIFIED
1 ½ HR. RATING

APPLICATION
Ruskin IBD2(SS) series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. IBD series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

MODEL IBF series meets the requirements for fire dampers established by:
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
  Listing (#3225-0245:0005) IBD2 and IBD2SS
- **New York City** (MEA 252-05-E)

FEATURES
- Static fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES
- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

OPTIONS
- **FM Approvals** as Specification Tested Product.
- **SP200 Switch Package** to allow remote indication of damper blade position.
- **Factory Sleeves** of various lengths and gages to ensure field compliance with UL installation requirements.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- **Welded Construction** for BC, WC, WR and WO Transition Styles
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) optional

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<tbody>
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<td>IBD2</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
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<tr>
<td>IBD2SS</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES*

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD2</td>
<td>4”w x 4”h (102 x 102)</td>
<td>6”w x 6”h (152 x 152)</td>
<td>33”w x 72”h (838 x 1829)</td>
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<tr>
<td></td>
<td>36”w x 36”h (914 x 914)</td>
<td></td>
<td>48”w x 30”h (1219 x 762)</td>
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<tr>
<td>IBD2SS</td>
<td></td>
<td></td>
<td>114”w x 38”h (2896 x 965)</td>
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</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
**APPLICATION**

Ruskin IBDT thin line series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with a fire resistance rating of less than 3 hours. IBDT series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire. The narrow depth of the damper assembly makes the IBDT series dampers perfect for transfer opening.

Model IBDT series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0005)
- New York City (MEA 252-05-E)

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBDT</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel spring clip type of horizontal mount only</td>
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<tr>
<td>IBDT1</td>
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<td></td>
<td></td>
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<tr>
<td>IBDT2</td>
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<td></td>
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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

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<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
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<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBDT</td>
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<td>40&quot; x 48&quot;h</td>
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<tr>
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<td>(1016 x 1219)</td>
</tr>
<tr>
<td>IBDT2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.

**FEATURES**

- Static fire dampers are produced in an ISO 9001 certified factory.

**TRANSITIONS AND STYLES**

- A Style –
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- G Style – Frame and blades in the airstream
  - For grille applications
  - Sleeve Required

**OPTIONS**

- FM Approvals as Specification Tested Product.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
APPLICATION

The fire damper models shown on this sheet are marked with a 1 1/2 hour fire damper label and are approved for use in fire walls or masonry floors with ratings of less than 3 hours. Fire Dampers require a field-or factory-installed sleeve. Select a sleeve of sufficient length to permit mounting angles attachment. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

STATIC FIRE DAMPERS – IBD models

Not for use in Dynamic (fans on) Systems.

MODEL IBD2 MAXIMUM SIZE

Single Section
Vertical Installation – 48”w x 30”h or 33”w x 72”h (1219 x 762 or 838 x 1829) or 36”w x 36”h (914 x 914).
Horizontal Installation – 30”w x 45 1/2”h (762 x 1156) or 33”w x 38”h (838 x 965).

Multiple Section Assembly
Vertical Installation – 120”w x 72”h (3048 x 1829).
Horizontal Installation – 90”w x 91”h (2286 x 2311) or 114”w x 38”h (2896 x 965).

MODEL IBD2SS MAXIMUM SIZE

Single Section
Vertical Installation – 48”w x 30”h or 33”w x 72”h (1219 x 762 or 838 x 1829) or 36”w x 36”h (914 x 914).
Horizontal Installation – 30”w x 45 1/2”h (762 x 1156) or 33”w x 38”h (838 x 965).

Multiple Section Assembly
Vertical Installation – 99”w x 72”h (2515 x 1829).
Horizontal Installation – 90”w x 91”h (2286 x 2311) or 114”w x 38”h (2896 x 965).

MODEL IBDT, IBD1 and IBDT2 MAXIMUM SIZE

Single Section
Vertical Installation – 40”w x 48”h (1016 x 1219).
Horizontal Installation – 60”w x 12”h (1524 x 305).

DYNAMIC FIRE DAMPERS

Use in Dynamic (fans on) or Static (fans off) Systems

MODEL DIBD2 MAXIMUM SIZE

Single Section
Vertical Installation – 33”w x 36”h (838 x 914).
Horizontal Installation – 24”w x 24”h (610 x 610).

Multiple Section Assembly
Vertical Installation – 72”w x 48”h (1828 x 1219) or 48”w x 72”h (1219 x 1828) or 120”w x 24”h (3048 x 610).

MODEL DIBD2X MAXIMUM SIZE

Single Section
Vertical Installation – 18”w x 24”h (457 x 610).
Horizontal Installation – 18”w x 24”h (457 x 610) or 24”w x 18”h (610 x 457).

Multiple Section Assembly
Horizontal Installation – 36”w x 48”h (914 x 1219) or 48”w x 36”h (1219 x 914).

MODEL DIBD2SS MAXIMUM SIZE

Single Section
Vertical or Horizontal Installation – 24”w x 24”h (610 x 610).

Multiple Section Assembly
Vertical Installation – 72”w x 48”h (1828 x 1219) or 48”w x 72”h (1219 x 1828) or 90”w x 24”h (2286 x 610).

INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instruction 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/Smoke Dampers Installation in Concrete Floor with Steel Deck
• Drivemate No. 14880 Breakaway Connection
• Flanged System Breakaway Connections
• Mullions for Dampers in Oversized Concrete Wall Openings

Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

California State Fire Marshal Listing No. 3225-245:005
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 or more installations the opening shall be a minimum of 1/2" 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

Use No. 10 (M5) bolts or screws, 3/8" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:

<table>
<thead>
<tr>
<th>Type</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Mount (In wall)</td>
<td>12&quot; (305)</td>
</tr>
<tr>
<td>Galvanized steel dampers</td>
<td>8&quot; (152) spacing</td>
</tr>
<tr>
<td>Stainless steel dampers</td>
<td>6&quot; (152) spacing</td>
</tr>
<tr>
<td>Horizontal Mount (In floor)</td>
<td>6&quot; (152) spacing</td>
</tr>
</tbody>
</table>

Multiple section horizontal mount dampers require a 14 gage thick x 4 1/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/8" (13) long welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (2.0) 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 a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation

Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic IBD and IBDX models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles

Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls or concrete/masonry walls and floors 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 side of the floor and must be attached to both the sleeve and the wall or floor. Mounting angles may be installed directly to the metal stud under the wall board on metal stud wall installations only. Larger openings 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 dampers may be installed using Ruskin FAST angle for one angle installation or Ruskin FPFMA for two angle installations.

a. Mounting Angle Fasteners

Sleeve: #10 bolts or screws, 3/16" (5) 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 a minimum of 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:

![Duct/Sleeve Connections Diagram]

A maximum of two #10 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 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 6 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.

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

For larger or more critical applications, a double or triple joint may be required as needed for airtightness.

c. Flanged Break-away Style Duct Sleeve Connections

Flanged connection systems manufactured by Ductmate, Nexus or Ward are approved break-away connections when installed as shown on the Flanged System Breakaway Connections Supplement. TDC and TDF roll-formed flanged connections using 3/4" (10) steel bolts and nuts, and metal cleats, as tested by SMACNA, are approved break-away connections when installed as shown on the Flanged System 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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION

TWO ANGLE INSTALLATION

ONE ANGLE INSTALLATION

HORIZONTAL INSTALLATION

TWO ANGLE INSTALLATION

ONE ANGLE INSTALLATION

Click to Return to: INDEX FSD SD IBD/DFD CFD
FIGURE 3

HORIZONTAL INSTALLATION

6" (152)
Max. c-c

3" (76)
Max.

See Note 2
Mullion Plate
See Note 2

FIGURE 4

VERTICAL INSTALLATION

6" (152) or
12" (305)
Max. c-c

3" (76)
Max.

See Note 2

FIGURE 5

REINFORCING PLATE

No Mullion
Plate Req’d

Mullion Required on 2 or more adjoining sections
See Note 2

No Mullion
Plate Req’d

See Note 2
Dynamic Curtain Fire Damper
UL555 Classified
1 ½ Hr. Rating

FEATURES
- Dynamic fire dampers are produced in an ISO 9001 certified factory.

FRAME - SLEEVE LENGTHS
- DIBD20 – 12” (305) long
- DIBD40 – 14” (356) long
- DIBD60 – 16” (406) long

TRANSITIONS AND STYLES
- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

OPTIONS
- FM Approvals as Specification Tested Product.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIBD20</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½</td>
</tr>
<tr>
<td>DIBD40</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½</td>
</tr>
<tr>
<td>DIBD60</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES*

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DIBD20</td>
<td>4”w x 4”h</td>
<td>6”w x 6”h</td>
<td>33”w x 36”h</td>
</tr>
<tr>
<td>DIBD40</td>
<td>4”w x 4”h</td>
<td>6”w x 6”h</td>
<td>33”w x 36”h</td>
</tr>
<tr>
<td>DIBD60</td>
<td>4”w x 4”h</td>
<td>6”w x 6”h</td>
<td>33”w x 36”h</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.

Application
Ruskin DIBD20, 40, 60 dynamic fire dampers provide point-of origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0005) DIBD20, 40 and 60
- New York City (MEA 252-05-E)
Static fire dampers are produced in an ISO 9001 certified factory.

**FEATURES**
- Static fire dampers are produced in an ISO 9001 certified factory.

**FRAME - SLEEVE LENGTHS**
- IBD20 – 12" (305) long
- IBD40 – 14" (356) long
- IBD60 – 16" (406) long

**TRANSITIONS AND STYLES**
- **A Style** – Frame and blades in the airstream
  - 75 to 85% free area
- **B Style** – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- **C Style** – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- **CR Style** – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- **CO Style** – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

**OPTIONS**
- **FM Approvals** as Specification Tested Product.
- **SP200 Switch Package** to allow remote indication of damper blade position.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) optional.

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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</thead>
<tbody>
<tr>
<td>IBD20</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½</td>
</tr>
<tr>
<td>IBD40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBD60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD20</td>
<td>4&quot;w x 4&quot;h</td>
<td>6&quot;w x 6&quot;h</td>
<td>33&quot;w x 72&quot;h</td>
</tr>
<tr>
<td>IBD40</td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(838 x 1829)</td>
</tr>
<tr>
<td>IBD60</td>
<td></td>
<td></td>
<td>48&quot;w x 30&quot;h</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1219 x 762)</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
INSTALLATION INSTRUCTIONS
1 1/2 HOUR UL CLASSIFIED
CURTAIN TYPE (D)IBD20, (D)IBD40, and (D)IBD60 FIRE DAMPERS
WITH INTEGRAL SLEEVES

APPLICATION
The (D)IBD20, (D)IBD40, and (D)IBD60 fire dampers include sleeves that are an integral part of the damper frame and are approved for installation without the need for a supplemental, field-installed sleeve. The fire damper models shown on this sheet are marked with a 1 1/2 hour fire damper label and are approved for use in fire walls or masonry floors with ratings of less than 3 hours. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems
MODELS IBD20, IBD40, and IBD60 MAXIMUM SIZE
Single Section
Vertical Installation – 48"w x 30"h (1219 x 762) or 33"w x 72"h (838 x 1829) or 36"w x 36"h (814 x 914)
Horizontal Installation – 30"w x 45 1/2"h (762 x 1156) or 33"w x 38"h (838 x 965)
Multiple Section Assembly
Vertical Installation – 120"w x 72"h (3048 x 1829)
Horizontal Installation – 90"w x 91"h (2286 x 2311)

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems
MODELS DIBD20, DIBD40, and DIBD60 MAXIMUM SIZE
Single Section
Vertical Installation – 33"w x 36"h (838 x 914)
Horizontal Installation – 24"w x 24"h (610 x 610)
Multiple Section Assembly
Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 120"w x 24"h (3048 x 610)
Horizontal Installation – Refer to “X” models below.
MODELS DIBD20X, DIBD40X, and DIBD60X MAXIMUM SIZE
Single Section
Vertical Installation – 18"w x 24"h (457 x 610)
Horizontal Installation – 18"w x 24"h (457 x 610) or 24"w x 18"h (610 x 457)
Multiple Section Assembly
Horizontal Installation – 36"w x 48"h (914 x 1219) or 48"w x 36"h (1219 x 914)

Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.
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 \( \frac{1}{16} \) inch per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed \( \frac{1}{8} \) inch per foot (3 per 305) plus 2\(^\circ\) (51), nor shall the opening be less than \( \frac{1}{16} \) inch (6) larger than the damper/sleeve assembly. For one angle installations, the opening shall be a minimum of \( \frac{1}{16} \) inch (6) to a maximum of 1\(^\circ\) (25) larger than the overall size of the damper/sleeve assembly. The opening may be as much as 2\(^\circ\) (51) larger than the damper/sleeve assembly if a 16ga (1.6) mounting angles is utilized.

2. Fasteners and Multiple Section Assembly
Use No. 10 (M5) bolts or screws, \( \frac{3}{16} \) inch (5) rivets, lack welds or spot welds as depicted in figures 3 and 4 as spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:
- Vertical Mount (In wall)
  - Galvanized steel dampers: 12\(^\circ\) (305) spacing
  - Horizontal Mount (In floor)
  - All dampers: 6\(^\circ\) (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x \( \frac{4}{16} \) inch (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with \( \frac{1}{16} \) inch (13) long welds staggered intermittently and spaced on maximum 6\(^\circ\) (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36\(^\circ\) (914) wide by 24\(^\circ\) (610) high and 14 gage (1.9) for dampers exceeding 36\(^\circ\) (914) wide by 24\(^\circ\) (610) high. Damper sleeve shall not extend more than 6\(^\circ\) (152) beyond the fire wall or partition unless damper is equipped with a factory installed access door. Sleeve may extend up to 16\(^\circ\) (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation
Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic DIBD and DIBDX models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles
Mounting angles shall be a minimum of \( 1\frac{1}{2} \) x \( 1\frac{1}{2} \) x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls or concrete/masonry walls and floors of sizes 90\(^\circ\) x 49\(^\circ\) or 49\(^\circ\) x 90\(^\circ\) (2286 x 1245 or 1245 x 2286) and less mounting angles are only required on one side of the wall or top side of the floor. The angles must be attached to both the sleeve and the wall or floor. Mounting angles may be installed directly to the metal stud under the wall board on metal stud wall installations only. Larger openings may have 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\(^\circ\) (25). Do not weld or fasten angles together at corners of dampers. Rushin fire dampers may be installed using Rushkin FAST angle for one angle installation or Rushin PKFA for two angle installations.

a. Mounting Angle Fasteners
- Sleeve: \#10 bolts or screws, \( \frac{3}{16} \) inch (5) steel rivets or \( \frac{1}{2} \) inch (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\(^\circ\) (152) o.c. and the wall or floor fasteners shall be spaced at 12\(^\circ\) (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 \( \frac{1}{2} \) inch (13). Screw fasteners used in wood stud must engage the wood stud a minimum of \( \frac{3}{4} \) inch (19). Screw fasteners used in masonry walls or floors must engage the wall a minimum of 1\(\frac{1}{2} \) inch (38). For two angle installations the fasteners shall be spaced at 8\(^\circ\) (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:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain &quot;S&quot; Slip</td>
<td>Duct diameters 4&quot; (102) wide drawband</td>
</tr>
<tr>
<td>Hemmed &quot;S&quot; Slip</td>
<td>Duct diameters 4&quot; (102) wide drawband with</td>
</tr>
<tr>
<td></td>
<td>metal cover</td>
</tr>
<tr>
<td>Double &quot;S&quot; Slip</td>
<td>Duct diameters 4&quot; (102) wide drawband</td>
</tr>
<tr>
<td>Inside Slip Joint</td>
<td>Duct diameters 4&quot; (102) wide drawband</td>
</tr>
<tr>
<td></td>
<td>with 1/2&quot; (13) metal cover</td>
</tr>
</tbody>
</table>

A maximum of two \#10 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 oval break-away connections must use either a 4" (102) wide drawband or \#10 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.

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 connections when installed as shown on the Flanged System Breakaway Connections Supplement. TDC and TDF roll-formed flanged connections using \( \frac{3}{4} \) inch (10) steel bolts and nuts, and metal cleats, as tested by SMACNA, are approved break-away connections when installed as shown on the Flanged System 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 gage (1.6) for dampers up to 36\(^\circ\) (914) wide x 24\(^\circ\) (610) high and 14 gage (2.0) for dampers exceeding 36\(^\circ\) (914) wide x 24\(^\circ\) (610) high.

7. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the wall.

TWO ANGLE INSTALLATION

ONE ANGLE INSTALLATION

FIGURE 1

HORIZONTAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the wall.

TWO ANGLE INSTALLATION

ONE ANGLE INSTALLATION

FIGURE 2
Application
Ruskin DIBD23(SS) series dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0004) DIBD23 and DIBD23SS
- New York City (MEA 252-05-E)

FEATURES
- Dynamic fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES
- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

OPTIONS
- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Welded Construction for BC, WC, WR and WO Transition Styles.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<td>DIBD23</td>
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<td>(in gages required by UL listing R5531)</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES

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<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section**</th>
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<tr>
<td></td>
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<tr>
<td>DIBD23</td>
<td>4”w x 4”h</td>
<td>6”w x 6”h</td>
<td>33”w x 36”h (838 x 914)</td>
</tr>
<tr>
<td></td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(610 x 610)</td>
</tr>
<tr>
<td>DIBD23SS</td>
<td>24”w x 24”h</td>
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<td>24”w x 24”h (610 x 610)</td>
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<td></td>
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* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa).
** See product data sheets for more details on single and multiple section sizing.
IBD23(SS) STATIC CURTAIN FIRE DAMPERS
UL555 CLASSIFIED
3 HR. RATING

FEATURES
- Static fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES
- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

OPTIONS
- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Welded Construction for BC, WC, WR and WO Transition Styles.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) optional.

APPLICATION
Ruskin IBD23(SS) series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. IBD series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal
  Listing (#3225-0245:0004) IBD23 and IBD23SS
- New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
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<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<tr>
<td>IBD23</td>
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<td>301 stainless steel constant force or spring clip type</td>
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</tr>
<tr>
<td>IBD23SS</td>
<td>304/316 Stainless Steel (in gages required by UL listing R5531)</td>
<td>304/316 Stainless Steel (in gages required by UL listing R5531)</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES*

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<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD23</td>
<td>4&quot;w x 4&quot;h</td>
<td>6&quot;w x 6&quot;h</td>
<td>36&quot;w x 36&quot;h</td>
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<tr>
<td>IBD23SS</td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(914 x 914)</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
INSTALLATION INSTRUCTIONS
3 HOUR UL CLASSIFIED
CURTAIN TYPE FIRE DAMPERS
MODEL (D)IBD23, (D)IBD23SS

APPLICATION
The (D)IBD23 carries a 3 hour fire damper label and is approved for use in fire walls or masonry floors with ratings of 3 hours or more. Fire Dampers require a field- or factory-installed sleeve. Select a sleeve of sufficient length to permit attachment, with perimeter mounting angles, to duct work on each side of wall or floor opening. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

MODEL IBD23 MAXIMUM SIZE
Single Section
- Vertical Installation – 36"w x 36"h (914 x 914).
- Horizontal Installation – 30"w x 45/2"h (762 x 1156).
Multiple Section Assembly
- Vertical Installation – 90"w x 72"h (2286 x 1829).
- Horizontal Installation – 90"w x 91"h (2286 x 2311).

MODEL IBD23SS MAXIMUM SIZE
Single Section
- Vertical Installation – 36"w x 36"h (914 x 914).
- Horizontal Installation – 30"w x 45/2"h (762 x 1156).
Multiple Section Assembly
- Vertical Installation – 90"w x 72"h (2286 x 1829).
- Horizontal Installation – 90"w x 91"h (2286 x 2311).

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

MODEL DIBD23 MAXIMUM SIZE
Single Section
- Vertical Installation – 33"w x 36"h (838 x 914).
- Horizontal Installation – 24"w x 24"h (610 x 610).
Multiple Section Assembly
- Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 90"w x 24"h (2286 x 610).

MODEL DIBD23X MAXIMUM SIZE
Single Section
- Horizontal Installation – 18"w x 24"h (457 x 610) or 24"w x 18"h (610 x 457).
Multiple Section Assembly
- Horizontal Installation – 36"w x 48"h (914 x 1219) or 48"w x 36"h (1219 x 914).

MODEL DIBD23SS MAXIMUM SIZE
Single Section
- Vertical or Horizontal Installation – 24"w x 24"h (610 x 610).
Multiple Section Assembly
- Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 90"w x 24"h (2286 x 610).

Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

California State Fire Marshal Listing No. 3225-245:004

SEE COMPLETE MARKING ON PRODUCT
1. Opening Clearance

The opening in the wall or floor shall be large than the damper/sleeve assembly to permit installation or expansion. 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 1/16” per foot (3 per 305) plus 2” (51), nor shall the opening be less than 1/2” (6) larger than the damper/sleeve assembly.

2. Fasteners and Multiple Section Assembly

Use No. 10 (M5) bolts or screws, 3/16” (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:

- Vertical Mount (In wall)
  - All dampers: 6” (152) spacing
- Horizontal Mount (In floor)
  - All dampers: 6” (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4 1/2” (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/2” (13) long welds staggered intermittently and spaced on maximum 6” (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36” (914) wide by 24” (610) high and 14 gage (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 a factory installed access door. Sleeve may extend up to 16” (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation

Use “Air Flow” and “Mount with Arrow Up” labels on Dynamic DIBD models for proper damper orientation. For Static IBD models use only “Mount With Arrow Up” label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles

Mounting angles shall be a minimum of 1 1/2” x 1 1/2” x 20 gage steel (38 x 38 x 1.0) 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 dampers may be installed using Ruskin PFMA.

a. Mounting Angle Fasteners

- Sleeve: #10 bolts or screws, 3/16” (5) 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

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 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 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.

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

- Hardcast, Inc. – Iron Grip 601 Eco Duct Seal 44-52
- Design Polymerics – DP 1010 Precision – PA2084
- 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 System Breakaway Connections Supplement.

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper shall be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the wall.

HORIZONTAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the floor.
FASTENER SPACING

HORIZONTAL INSTALLATION

- 6" (152) Max. c-c
- 3" (76) Max.

See Note 2
Mullion Plate
See Note 2

FIGURE 3

VERTICAL INSTALLATION

- 6" (152) Max. c-c
- 3" (76) Max.
- 6" (152) or 12" (305) Max. c-c
- 2" (51) Max.

See Note 2

FIGURE 4

REINFORCING PLATE

- No Mullion Plate Req’d
- Mullion Required on 2 or more adjoining sections
See Note 2

FIGURE 5
DIBD230, DIBD430 and DIBD630 Dynamic Curtain Fire Damper
UL555 Classified
1 ½ Hr. Rating

Application
Ruskin DIBD230, 430 and 630 dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal
  Listing (#3225-0245:0004) DIBD230, 430 and 630
- New York City (MEA 252-05-E)

FEATURES
- Dynamic fire dampers are produced in an ISO 9001 certified factory.

FRAME - SLEEVE LENGTHS
- DIBD230 – 12” (305) long
- DIBD430 – 14” (356) long
- DIBD630 – 16” (406) long

TRANSITIONS AND STYLES
- A Style – Frame and blades in the airstream
  o 75 to 85% free area
- B Style – Blades out of the airstream
  o 80 to 90% free area
  o Not air tight
- C Style – Blades and frame out of the airstream
  o Square or rectangular enclosure
  o 95 to 100% free area
  o Sealed assembly
- CR Style – Blades and frame out of the airstream
  o Round enclosure
  o 95 to 100% free area
  o Sealed assembly
- CO Style – Blades and frame out of the airstream
  o Oval enclosure
  o 95 to 100% free area
  o Sealed assembly

OPTIONS
- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

SPECIFICATIONS

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<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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MAXIMUM UL CLASSIFIED DAMPER SIZES*

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<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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<td>6&quot;w x 6&quot;h (152 x 152)</td>
<td>24&quot;w x 24&quot;h (610 x 610)</td>
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<tr>
<td></td>
<td>DIBD630</td>
<td>36&quot;w x 48&quot;h (914 x 1219)</td>
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* See product data sheets for more details on single and multiple section sizing.
**IBD230 IBD430 and IBD630 Static Curtain Fire Damper**

**UL555 Classified 3 Hr. Rating**

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**Features**
- Static fire dampers are produced in an ISO 9001 certified factory.

**Frame - Sleeve Lengths**
- IBD230 – 12” (305) long
- IBD430 – 14” (356) long
- IBD630 – 16” (406) long

**Transitions and Styles**
- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

**Options**
- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) optional.

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**Application**
Ruskin IBD20, 40, 60 and IBD230, 430 and 630 static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. IBD series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0004) IBD230, 430 and 630
- New York City (MEA 252-05-E)

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**Specifications**

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<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<td>Galvanized Steel (in gages required by UL listing R5531)</td>
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<td>IBD630</td>
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**Maximum UL Classified Damper Sizes**

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<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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<tr>
<td>IBD230</td>
<td>4”w x 4”h (102 x 102)</td>
<td>6”w x 6”h (152 x 152)</td>
<td>36”w x 36”h (914 x 914)</td>
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</table>

**Note:** See product data sheets for more details on single and multiple section sizing.
## INSTALLATION INSTRUCTIONS
### 3 HOUR UL CLASSIFIED
CURTAIN TYPE (D)IBD230, (D)IBD430, and (D)IBD630 FIRE DAMPERS WITH INTEGRAL SLEEVES

### APPLICATION
The (D)IBD230, (D)IBD430, and (D)IBD630 fire dampers include sleeves that are an integral part of the damper frame and are approved installation without the need for a supplemental, field-installed sleeve. Select the damper with sufficient length to permit attachment, with perimeter mounting angles, to ductwork to each side of wall or floor opening. The fire damper models shown on this sheet are marked with a 1½ hour fire damper label and are approved for use in fire walls or masonry floors with ratings of less than 3 hours. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

### STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

**MODELS IBD230, IBD430, and IBD630 MAXIMUM SIZE**

- **Single Section**
  - Vertical Installation – 36"w x 36"h (914 x 914).
  - Horizontal Installation – 30"w x 45"½"h (762 x 1156).
- **Multiple Section Assembly**
  - Vertical Installation – 90"w x 72"h (2286 x 1829).
  - Horizontal Installation – 90"w x 91"h (2286 x 2311).

### DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

**MODELS DIBD230, DIBD430, and DIBD630 MAXIMUM SIZE**

- **Single Section**
  - Vertical Installation – 33"w x 36"h (838 x 914).
  - Horizontal Installation – 24"w x 24"h (610 x 610).
- **Multiple Section Assembly**
  - Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 90"w x 24"h (2286 x 610).

**MODELS DIBD230X, DIBD430X, and DIBD630X MAXIMUM SIZE**

- **Single Section**
  - Horizontal Installation – 18"w x 24"h (457 x 610) or 24"w x 18"h (610 x 457).
- **Multiple Section Assembly**
  - Horizontal Installation – 36"w x 48"h (914 x 1219) or 48"w x 36"h (1219 x 914).

### Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

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

- Optional Sealant of Dampers in Fire Rated Walls or Floor Openings
- Transfer Openings and Duct Terminations for 1½ Hour and 3 Hour Fire Dampers
- Optional FireStop Material
- Extension of Fire and Combination Fire and Smoke Damper Sleeves
- Fire and Combination Fire and Smoke Dampers Installation in Concrete Floor with Steel Deck
- Drivemate No. 14880 Breakaway Connections
- Flanged System Breakaway Connections

See complete marking on product.

California State Fire Marshal Listing No. 3225-245:004

© Ruskin 2014
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. The opening shall be a minimum of 1 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 1/2" (6) larger than the damper/sleeve assembly.

2. Fasteners and Multiple Section Assembly
Use No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:
- **Vertical Mount (In wall)**
  - All dampers 6" (152) spacing
- **Horizontal Mount (In floor)**
  - All dampers 6" (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4/1/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/2" (13) long welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 30" (914) wide by 24" (610) high and 14 gage (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 a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation
Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic DIBD models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles
Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0) 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 dampers may be installed using Ruskin PFMA.

   a. **Mounting Angle Fasteners**
      - Sleeve: #10 bolts or screws, 3/16" (5) 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**
      Fasteners shall be spaced at 6" (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:

   b. **Round and Oval Break-away Connections**
      Round and flat oval break-away connections must use either a 4" (102) wide drawband or #10 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.

      **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 connections when installed as shown on the Flanged System 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 System 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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
Damper is properly installed when leading edge of closed blade is within the wall.

![Diagram of vertical installation]

FIGURE 1

HORIZONTAL INSTALLATION
Damper is properly installed when leading edge of closed blade is within the wall.

![Diagram of horizontal installation]

FIGURE 2
FASTENER SPACING

VERTICAL INSTALLATION

![Diagram of vertical installation with fastener spacing notes]

HORIZONTAL INSTALLATION

![Diagram of horizontal installation with fastener spacing notes]

FIGURE 3

FIGURE 4

REINFORCING PLATE

![Diagram of reinforcing plate with notes]

Mullion Required on 2 or more adjoining sections
See Note 2

No Mullion Plate Req'd

FIGURE 5
FD60 High Performance Dynamic Fire Dampers
UL555 Classified
1 ½ Hr. Rating

Application

Ruskin DFD60 dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DFD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DFD60 series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa).

FEATURES

- Dynamic fire dampers are produced in an ISO 9001 certified factory.

OPTIONS

- FM Approvals as Specification Tested Product.
- SP100 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

Model DFD60 series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0004)
- New York City (MEA 252-05-E)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFD60</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>301 stainless steel</td>
<td>1 ½</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DFD60</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>32&quot;w x 48&quot;h (813 x 1219)</td>
</tr>
<tr>
<td></td>
<td>30&quot;w x 48&quot;h (762 x 1219)</td>
<td>64&quot;w x 96&quot;h (1626 x 2438)</td>
<td>60&quot;w x 96&quot;h (1524 x 2438)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
**FEATURES**
- Dynamic fire dampers are produced in an ISO 9001 certified factory.

**OPTIONS**
- FM Approvals as Specification Tested Product.
- SP100 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

**APPLICATION**
Ruskin DFD35 dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DFD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DFD35 series have a dynamic closure rating up to 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa).

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFD35</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>301 stainless steel</td>
<td>1 ½</td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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<tbody>
<tr>
<td></td>
<td>Vertical</td>
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<tr>
<td>DFD35</td>
<td>8”w x 6”h</td>
<td>8”w x 6”h</td>
<td>36”w x 48”h</td>
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<tr>
<td></td>
<td>(203 x 152)</td>
<td>(203 x 152)</td>
<td>(914 x 1219)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
FD60 Static Fire Dampers
UL555 Classified
1 ½ Hr. Rating

FEATURES
• Static fire dampers are produced in an ISO 9001 certified factory.

OPTIONS
• FM Approvals as Specification Tested Product.
• SP100 Switch Package to allow remote indication of damper blade position.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
• Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

APPLICATION
Ruskin FD60 static fire dampers provide point-of origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. FD60 series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

SPECIFICATIONS

<table>
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<th>Blades</th>
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<td>FD60</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>301 stainless steel</td>
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<td>8&quot;w x 6&quot;h (203 x 152)</td>
<td>32&quot;w x 48&quot;h (813 x 1219)</td>
</tr>
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# FD35 Static Fire Dampers

**UL555 Classified**

1 ½ Hr. Rating

---

**FEATURES**

- Dynamic fire dampers are produced in an ISO 9001 certified factory.

**OPTIONS**

- **FM Approvals** as Specification Tested Product.
- **SP100 Switch Package** to allow remote indication of damper blade position.
- **Factory Sleeves** of various lengths and gages to ensure field compliance with UL installation requirements.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

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**APPLICATION**

Ruskin FD35 static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. FD35(SS) series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

---

**SPECIFICATIONS**

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<tr>
<td>FD35</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>301 stainless steel</td>
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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

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</tr>
<tr>
<td></td>
<td>(203 x 152)</td>
<td>(203 x 152)</td>
<td>(914 x 1219)</td>
</tr>
</tbody>
</table>

---

Model FD35 series meets the requirements for fire dampers established by:

- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3225-0245:0005)
- **New York City** (MEA 252-05-E)
INSTALLATION INSTRUCTIONS
DFD35, DFD60, FD35 AND FD60 FIRE RATED MULTIPLE BLADE DAMPER
1½ HOUR RATING FOR USE IN DYNAMIC AND STATIC SYSTEMS

APPLICATION
The DFD35, DFD60 dynamic fire dampers are designed for use in dynamic (fans on) or static (fans off) systems. The FD35, FD60 static fire dampers are for use in static (fans off) systems only. These multiple blade fire dampers are designed to operate with the blades running horizontally. The standard application is with the leading edge of the closed blades within the walls, partitions or masonry floors; with fire resistance rating of less than 3 hours. For out of wall or floor installation refer to the GA or OW versions of the (D)FD35 and (D)FD60.

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems
DFD35 MAXIMUM UL CLASSIFIED SIZES
Single section vertical and horizontal installation
36”w x 48”h (914 x 1219)
Multiple section assembly vertical and horizontal installation
72”w x 96”h (1829 x 2438) or 120”w x 48”h (3048 x 1219)

DFD60 MAXIMUM UL CLASSIFIED SIZES
Single section vertical installation
32”w x 48”h (813 x 1219)
Single section horizontal installation
30”w x 48”h (762 x 1219)
Multiple section assembly vertical installation
64”w x 96”h (1626 x 2438) or 120”w x 48”h (3048 x 1219) or 90”w x 64”h (2286 x 1626)
Multiple section assembly horizontal installation
60”w x 96”h (1524 x 2438) or 120”w x 48”h (3048 x 1219) or 90”w x 64”h (2286 x 1626)

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems
FD35 MAXIMUM UL CLASSIFIED SIZES
Single section vertical and horizontal installation
36”w x 48”h (914 x 1219)
Multiple section assembly vertical and horizontal installation
120”w x 96”h (3048 x 2438)

FD60 MAXIMUM UL CLASSIFIED SIZES
Single section vertical installation
32”w x 48”h (813 x 1219)
Single section horizontal installation
30”w x 48”h (762 x 1219)
Multiple section assembly vertical and horizontal installation
120”w x 96”h (3048 x 2438)

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS
Refer to the Ruskin installation instruction supplements for additional information or special requirements:
• FD35GA and FD60GA installation instruction for Grill Access Installation
• FD350OW and FD600OW installation instruction for Out of Wall Installation
• Optional Sealant of Dampers in Fire Rated Wall or Floor Openings
• Transfer Openings and Duct Terminations
• Optional FireStop Material installation
• Extension of Fire and Combination Fire and Smoke Damper Sleeves
• Fire and Combination Fire and Smoke Damper Installation in Concrete Floor with Steel Deck
• Flanged System Breakaway Connections
• Cavity Shaft Wall Metal Stud Framing
• SP100 Switch Package

See complete marking on product
California State Fire Marshal Listing No.
(D)FD60 – 3225-0245:0004
(D)FD35 – 3225-0245:0005
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation and expansion. For two angle installations the opening shall be a minimum of 1 1/2" per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed 1/4" 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.

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 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.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 blades 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 the jackshaft above or below the floor.

5. Mounting Angles
Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage 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 wallboard on metal stud wall installations only. Larger openings 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
      To sleeve #10 bolts or screws, 3/16" (5) 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:
      - PLAIN "S" SLIP
      - HEIMED "S" SLIP
      - DOUBLE "S" SLIP
      - INSIDE SLIP JOINT
      - STANDING S
      - STANDING (ANGLE REINFORCED)
      - STANDING (ALT)
      - STANDING S (BAR REINFORCED)
      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 Polymeric – 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 3/4" (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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (1.9) for dampers 36" (914) wide x 24" (610) high.

7. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or jackshaft. Dampers must be maintained, cycled and tested in accordance with the latest editions of NFPA 60, 90A, 92A, 92B, 105, UL864, AMCA 503 and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION

ITEM DESCRIPTION
1. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connection
6. Over-center Link

HORIZONTAL INSTALLATION

ITEM DESCRIPTION
1. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connection
6. Over-center Link
7. Opening Clearance

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

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

Click to Return to: INDEX FSD SD IBD/DFD CFD
**DFD35SS AND FD35SS STATIC FIRE DAMPERS**

**UL555 CLASSIFIED**

**1 ½ HR. RATING**

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**APPLICATION**

Ruskin DFD35SS and FD35SS static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DFD35(SS) series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

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**FEATURES**

- Dynamic fire dampers are produced in an ISO 9001 certified factory.

**OPTIONS**

- **FM Approvals** as Specification Tested Product.
- **SP100 Switch Package** to allow remote indication of damper blade position.
- **Factory Sleeves** of various lengths and gages to ensure field compliance with UL installation requirements.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

Model FD35SS series meets the requirements for fire dampers established by:

- **ICC International Building Codes**
- **CSFM California State Fire Marshal Listing** (#3225-0245.0005)
- **New York City** (MEA 252-05-E)

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**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFD35SS</td>
<td>5” x 16 gage (127 x 1.6) 304/316 stainless steel, single piece, hat-shaped channel.</td>
<td>6” (152) wide and 16 (1.6) gage 304/316 stainless steel.</td>
<td>301 stainless steel</td>
<td>1 ½</td>
</tr>
<tr>
<td>FD35SS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical or Horizontal</td>
</tr>
<tr>
<td>DFD35SS</td>
<td>8&quot; x 6&quot;h (203 x 152)</td>
<td>30&quot;w x 48&quot;h (762 x 1219)</td>
<td>60&quot;w x 96&quot;h (1524 x 2438)</td>
</tr>
<tr>
<td>FD35SS</td>
<td>8&quot; x 6&quot;h (203 x 152)</td>
<td>90&quot;w x 48&quot;h (2286 x 1219)</td>
<td></td>
</tr>
</tbody>
</table>
APPLICATION
The DFD35SS dynamic fire damper is designed for use in dynamic (fans on) or static (fans off) systems. The FD35SS static fire dampers are for use in static (fans off) systems only. Multiple blade fire dampers are designed to operate with the blades running horizontally. The standard application is with the leading edge of the closed blades within the walls, partitions or masonry floors; with fire resistance rating of less than 3 hours. For out of wall or floor installation refer to the GA or OW versions of the (D)FD35SS.

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

DFD35SS MAXIMUM UL CLASSIFIED SIZES
Single section vertical and horizontal installation
30"w x 48"h (762 x 1219)
Multiple section assembly vertical and horizontal installation
90"w x 48"h (2286 x 1219)

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

FD35SS MAXIMUM UL CLASSIFIED SIZES
Single section vertical and horizontal installation
30"w x 48"h (762 x 1219)
Multiple section assembly vertical and horizontal installation
90"w x 48"h (2286 x 1219)

Dimensions shown in parentheses (   ) indicate millimeters.

INSTALLATION SUPPLEMENTS
Refer to the Ruskin installation instruction supplements for additional information or special requirements:
• FD35GA and FD60GA installation instruction for Grill Access Installation
• FD350OW and FD600OW installation instruction for Out of Wall installation
• Optional Sealant of Dampers in Fire Rated Wall or Floor Openings
• Transfer Openings and Duct Terminations
• Optional FireStop Material installation
• Extension of Fire and Combination Fire and Smoke Damper Sleeves
• Fire and Combination Fire and Smoke Damper Installation in Concrete Floor with Steel Deck
• Flanged System Breakaway Connections
• Cavity Shaft Wall Metal Stud Framing
• SP100 Switch Package

California State Fire Marshal Listing No. (D)FD35SS 3225-245:0005

SEE COMPLETE MARKING ON PRODUCT
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation and expansion. The damper opening shall be a minimum of \( \frac{3}{16} \)" per foot (5 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed \( \frac{1}{16} \)" per foot (5 per 305) plus 2" (51), nor shall the opening be less than \( \frac{1}{4} \)" (6) larger than the damper/sleeve assembly.

2. Fasteners and Multiple Section Assembly
When joining multiple assemblies or fastening the damper to the sleeve, dampers shall be fastened with 1/4-20 (M6) bolts, number 10 (M5) screws, or \( \frac{1}{2} \)" (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.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.5) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 blades 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 the jackshaft above or below the floor.

5. Mounting Angles
Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls and concrete/masonry wall/floor, mounting angles on both sides of the wall or floor 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 the corners of dampers.

a. Mounting Angle Fasteners
   - Sleeve #10 bolts or screws, \( \frac{1}{16} \)" (3) steel rivets or \( \frac{1}{2} \)" (13) long welds.

b. Mounting Angle Fastener Spacing
   - Two angle installations the fasteners shall be spaced at 8" (205) o.c.

6. Duct/Sleeve Connections
   a. Break-away Duct/Sleeve Connections
   - Rectangular ducts must use one or more of the connections depicted below:

   ![Diagram of Duct/Sleeve Connections]

   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 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 Polymeric – 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.

   d. Non-Break-away Duct/Sleeve Connections
   If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (1.9) for dampers larger than 36" (914) wide by 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
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or jackshaft. Dampers must be maintained, cycled and tested in accordance with the latest editions of NFPA 80, 90A, 92A, 92B, 105, UL864, AMCA 503 and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
**VERTICAL INSTALLATION**

1" (25) Min. Typical Overlap on all sides of partition wall

*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. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connection
6. Over-center Link
7. Opening Clearance

**HORIZONTAL INSTALLATION**

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

*FAST ANGLE (ONE ANGLE) INSTALLATION*
Angle may be installed on top of floor.

**ITEM DESCRIPTION**
1. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connection
6. Over-center Link
7. Opening Clearance
FEATURES

• Dynamic fire dampers are produced in an ISO 9001 certified factory.

OPTIONS

• FM Approvals as Specification Tested Product.
• SP100 Switch Package to allow remote indication of damper blade position.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
• Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

APPLICATION

Ruskin DFD60-3 dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. DFD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DFD60 series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa).

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFD60-3</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>One-piece airfoil, nominal 6&quot; (152) wide and 16 (1.6) gage galvanized steel equivalent thickness.</td>
<td>301 stainless steel</td>
<td>3</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DFD60-3</td>
<td>8&quot;w x 6&quot;h</td>
<td>30&quot;w x 48&quot;h</td>
<td>60&quot;w x 96&quot;h</td>
</tr>
<tr>
<td></td>
<td>(203 x 152)</td>
<td>(762 x 1219)</td>
<td>(1524 x 2438)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120&quot;w x 48&quot;h</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(3048 x 1219)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)

Model DFD60-3 series meets the requirements for fire dampers established by:
• ICC International Building Codes
• New York City (MEA 252-05-E)
FD60-3 Static Fire Dampers
UL555 Classified
3 Hr. Rating

FEATURES
• Static fire dampers are produced in an ISO 9001 certified factory.

OPTIONS
• FM Approvals as Specification Tested Product.
• SP100 Switch Package to allow remote indication of damper blade position.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
• Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

APPLICATION
Ruskin FD60-3 static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. FD60-3 series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD60-3</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>One-piece airfoil, nominal 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>301 stainless steel</td>
<td>3</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>FD60-3</td>
<td>8” w x 6”h (203 x 152)</td>
<td>8” w x 6”h (203 x 152)</td>
<td>30” w x 48”h (762 x 1219)</td>
</tr>
</tbody>
</table>
INSTALLATION INSTRUCTIONS
DFD60-3 AND FD60-3 FIRE RATED MULTIPLE BLADE DAMPER
3 HOUR UL555 RATING FOR USE IN DYNAMIC AND STATIC SYSTEMS

APPLICATION
The DFD60-3 dynamic fire damper is designed for use in dynamic (fans on) or static (fans off) systems. The FD60-3 static fire dampers are for use in static (fans off) systems only. Multiple blade fire dampers are designed to operate with the blades running horizontally. The standard application is with the leading edge of the closed blades within the walls, partitions or masonry floors; with fire resistance rating of 3 hours or more.

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

DFD60-3 MAXIMUM UL CLASSIFIED SIZES
Single section vertical and horizontal installation
30"w x 48"h (762 x 1219)
Multiple section assembly vertical and horizontal installation
60"w x 96"h (1524 x 2438) or 120"w x 48"h (3048 x 1219) or 90"w x 64"h (2286 x 1626)

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

FD60-3 MAXIMUM UL CLASSIFIED SIZES
Single section vertical and horizontal installation
30"w x 48"h (762 x 1219)
Multiple section assembly vertical and horizontal installation
120"w x 96"h (3048 x 2438)

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
• SP100 Switch Package

California State Fire Marshal Listing No. (D)FD60-3 3225-245:0004
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation and expansion. The opening shall be a minimum of 1/6" 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.

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.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 shall 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 blades 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 the jackshaft above or below the floor.

5. Mounting Angles
Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0), installed on both sides of the partition and attached only to the sleeve. Mounting angles must overlap the partition a minimum of 1" (25). Do not weld or fasten angles together at the corners of damper. Ruskin fire dampers may be installed using Ruskin PFMA for two angle installations.

a. Mounting Angle Fasteners
   #10 (M5) bolts or screws, 3/16" (3) steel rivets or 1/2" (13) long welds.

b. Mounting Angle Fastener Spacing
   Fasteners shall be spaced at 8" (203) o.c. with a minimum of 2 on each side, top and bottom.

6. Duct/Sleeve Connections
   a. Break-away Duct/Sleeve Connections
      Rectangular ducts must use one or more of the connections depicted below:

5. Mounting Angles continued
   a. Mounting Angle Fasteners
      #10 (M5) bolts or screws, 3/16" (3) steel rivets or 1/2" (13) long welds.
   b. Mounting Angle Fastener Spacing
      Fasteners shall be spaced at 8" (203) o.c. with a minimum of 2 on each side, top and bottom.

6. Duct/Sleeve Connections
   a. Break-away Duct/Sleeve Connections
      Rectangular ducts must use one or more of the connections depicted below:

     - Plain "S" Slip
     - Hemmed "S" Slip
     - Double "S" Slip
     - Inside Slip Joint
     - Standing S (Angle Reinforced)
     - Standing S (Angle, Alternate)
     - Standing S (Bar Reinforced)
     - Standing S (Angle, Alternate, Reinforced)
     - Drive Slip Joint

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 Polymeric – DP 1010
   - Hardcast, Inc. – Iron Grip 601
   - Eco Duct Seal 44-52
   - Design Polymerics – DP 1010
   - Precision – PA2084T
   - Hardcast, Inc. – Iron Grip 601
   - Eco Duct Seal 44-52
   - 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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (1.9) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance
   To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or jackshaft. Dampers must be maintained, cycled and tested in accordance with the latest editions of NFPA 80, 90A, 92A, 92B, 105, UL864, AMCA 503 and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
TWO ANGLE INSTALLATION
Angles are required on both sides of the partition

ITEM DESCRIPTION
1. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connections
6. Overcenter Link
7. Opening Clearance

HORIZONTAL INSTALLATION
TWO ANGLE INSTALLATION
Angles are required on both sides of the floor

ITEM DESCRIPTION
1. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connections
6. Overcenter Link
7. Opening Clearance
DIBD2-CUL AND DIBD2SS-CUL DYNAMIC CURTAIN FIRE DAMPERS
UL555 CLASSIFIED
1 ½ HR. RATING

APPLICATION

Ruskin DIBD2(SS)-CUL (for the Canadian market) series dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal
  Listing (#3225-0245:000S) DIBD2 and DIBD2SS
- New York City (MEA 252-05-E)

FEATURES

- Dynamic fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES

- A Style – Frame and blades in the airstream
  o 75 to 85% free area
- B Style – Blades out of the airstream
  o 80 to 90% free area
  o Not air tight
- C Style – Blades and frame out of the airstream
  o Square or rectangular enclosure
  o 95 to 100% free area
  o Sealed assembly
- CR Style – Blades and frame out of the airstream
  o Round enclosure
  o 95 to 100% free area
  o Sealed assembly
- CO Style – Blades and frame out of the airstream
  o Oval enclosure
  o 95 to 100% free area
  o Sealed assembly

OPTIONS

- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- Welded Construction for BC, WC, WR and WO Transition Styles
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIBD2-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½</td>
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<tr>
<td>DIBD2SS-CUL</td>
<td>304 Stainless Steel (in gages required by UL listing R5531)</td>
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<td></td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section**</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DIBD2-CUL</td>
<td>4&quot;w x 4&quot;h</td>
<td>6&quot;w x 6&quot;h</td>
<td>33&quot;w x 36&quot;h (838 x 914)</td>
</tr>
<tr>
<td></td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(610 x 610)</td>
</tr>
<tr>
<td>DIBD2SS-CUL</td>
<td>24&quot;w x 24&quot;h</td>
<td>24&quot;w x 24&quot;h (610 x 610)</td>
<td></td>
</tr>
</tbody>
</table>

** See product data sheets for more details on single and multiple section sizing.
APPLICATION

Ruskin IBD2(SS)-CUL (for the Canadian market) series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. IBD series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire

Model IBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0005) IBD2 and IBD2SS
- New York City (MEA 252-05-E)

FEATURES

- Static fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES

- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

OPTIONS

- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- Welded Construction for BC, WC, WR and WO Transition Styles
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) optional

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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</thead>
<tbody>
<tr>
<td>IBD2-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
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<tr>
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<td>304/316 Stainless Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES*

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<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD2-CUL</td>
<td>4&quot;w x 4&quot;h (102 x 102)</td>
<td>6&quot;w x 6&quot;h (152 x 152)</td>
<td>33&quot;w x 72&quot;h (838 x 1829)</td>
</tr>
<tr>
<td>IBD2SS-CUL</td>
<td>36&quot;w x 36&quot;h (914 x 914)</td>
<td>30&quot;w x 45&quot;h (762 x 1143)</td>
<td>99&quot;w x 72&quot;h (2514 x 1829)</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
Ruskin IBDT-CUL (for the Canadian market) thin line series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with a fire resistance rating of less than 3 hours. IBT series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire. The narrow depth of the damper assembly makes the IBDT series dampers perfect for transfer opening.

Model IBDT series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0005)
- New York City (MEA 252-05-E)

**APPLICATION**

**FEATURES**
- Static fire dampers are produced in an ISO 9001 certified factory.

**TRANSITIONS AND STYLES**
- A Style –
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- G Style – Frame and blades in the airstream
  - For grille applications
  - Sleeve Required

**OPTIONS**
- FM Approvals as Specification Tested Product.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<td>301 stainless steel spring clip type of</td>
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<td>(in gages required by UL</td>
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**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBDT-CUL</td>
<td>4&quot;w x 4&quot;h</td>
<td>4&quot;w x 4&quot;h</td>
<td>40&quot;w x 48&quot;h</td>
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<tr>
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<td>(102 x 102)</td>
<td>(102 x 102)</td>
<td>(1016 x 1219)</td>
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<tr>
<td>IBDT1-CUL</td>
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<td></td>
</tr>
<tr>
<td>IBDT2-CUL</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
## INSTALLATION INSTRUCTIONS

### 1 1/2 HOUR UL CLASSIFIED

**CURTAIN TYPE (D)IBD2-CUL, (D)IBD2SS-CUL AND IBDT-CUL FIRE DAMPERS**

### APPLICATION

The fire damper models shown on this sheet are marked with a 1 1/2 hour fire damper label and are approved for use in fire walls or masonry floors with ratings of less than 3 hours. Fire Dampers require a field-or factory-installed sleeve. Select a sleeve of sufficient length to permit mounting angles attachment. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

### STATIC FIRE DAMPERS – IBD models

Not for use in Dynamic (fans on) Systems.

#### MODEL IBD2-CUL MAXIMUM SIZE

**Single Section**
- Vertical Installation – 48”w x 30”h or 33”w x 72”h (1219 x 762 or 838 x 1829) or 36”w x 36”h (914 x 914).
- Horizontal Installation – 30”w x 45 1/2”h (762 x 1156) or 33”w x 38”h (838 x 965).

**Multiple Section Assembly**
- Vertical Installation – 120”w x 72”h (3048 x 1829).
- Horizontal Installation – 90”w x 91”h (2286 x 2311) or 114”w x 38”h (2896 x 965).

#### MODEL IBD2SS-CUL MAXIMUM SIZE

**Single Section**
- Vertical Installation – 48”w x 30”h or 33”w x 72”h (1219 x 762 or 838 x 1829) or 36”w x 36”h (914 x 914).
- Horizontal Installation – 30”w x 45 1/2”h (762 x 1156) or 33”w x 38”h (838 x 965).

**Multiple Section Assembly**
- Vertical Installation – 99”w x 72”h (2515 x 1829).
- Horizontal Installation – 90”w x 91”h (2286 x 2311) or 114”w x 38”h (2896 x 965).

#### MODEL IBDT-CUL, IBDT1-CUL and IBDT2-CUL MAXIMUM SIZE

**Single Section**
- Vertical Installation – 40”w x 48”h (1016 x 1219).
- Horizontal Installation – 60”w x 12”h (1524 x 305).

### DYNAMIC FIRE DAMPERS

Use in Dynamic (fans on) or Static (fans off) Systems.

#### MODEL DIBD2-CUL MAXIMUM SIZE

**Single Section**
- Vertical Installation – 33”w x 36”h (838 x 914).
- Horizontal Installation – 24”w x 24”h (610 x 610).

**Multiple Section Assembly**
- Vertical Installation – 72”w x 48”h (1828 x 1219) or 48”w x 72”h (1219 x 1828) or 120”w x 24”h (3048 x 610).

#### MODEL DIBD2X-CUL MAXIMUM SIZE

**Single Section**
- Vertical Installation – 18”w x 24”h (457 x 610).
- Horizontal Installation – 18”w x 24”h (457 x 610) or 24”w x 18”h (610 x 457).

**Multiple Section Assembly**
- Horizontal Installation – 36”w x 48”h (914 x 1219) or 48”w x 36”h (1219 x 914).

#### MODEL DIBD2SS-CUL MAXIMUM SIZE

**Single Section**
- Vertical or Horizontal Installation – 24”w x 24”h (610 x 610).

**Multiple Section Assembly**
- Vertical Installation – 72”w x 48”h (1828 x 1219) or 48”w x 72”h (1219 x 1828) or 90”w x 24”h (2286 x 610).

### INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instruction 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/Smoke Dampers Installation in Concrete Floor with Steel Deck
- Drivemate No. 14880 Breakaway Connection
- Flanged System Breakaway Connections
- Mullions for Dampers in Oversized Concrete Wall Openings

**Notes:**
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

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California State Fire Marshal Listing No. 3225-245:005
1. Opening Clearance

The opening in the wall or floor shall be larger than the duct/sleeve assembly to permit installation or expansion. For two damper 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

Use No. 10 (M5) bolts or screws, 3/4" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:

- **Vertical Mount (In wall)**
  - Galvanized steel dampers: 12" (305) spacing
  - Stainless steel dampers: 6" (152) spacing

- **Horizontal Mount (In floor)**
  - All dampers: 6" (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4 1/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/2" (13) long welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (2.0) 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 a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation

Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic IBD and IBDX models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles

Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls or concrete/masonry walls and floors 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 side of the floor and must be attached to both the sleeve and the wall or floor. Mounting angles may be installed directly to the metal stud under the wall board on metal stud wall installations only. Large openings 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 dampers may be installed using Ruskin FAST angle for one angle installation or Ruskin FPMFA for two angle installations.

a. Mounting Angle Fasteners

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeve:</td>
<td>#10 bolts or screws, 3/8&quot; (5) steel rivets or 1/2&quot; (13) long welds. Masonry/Wall or Floor: #10 self-tapping concrete screws. Wood/Steel Stud Wall: #10 screws</td>
</tr>
</tbody>
</table>

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 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:

```
<table>
<thead>
<tr>
<th>Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAIN 5&quot; SLIP</td>
<td>HUMID &quot;D&quot; SLIP</td>
</tr>
<tr>
<td>DOUBLE &quot;D&quot; SLIP</td>
<td>INSIDE SLIP JOINT</td>
</tr>
<tr>
<td>STANDING S (ANGLE REINFORCED)</td>
<td>STANDING S (BAR REINFORCED)</td>
</tr>
<tr>
<td>STANDING S (ANGLE REINFORCED)</td>
<td>DRIVE SLIP JOINT</td>
</tr>
</tbody>
</table>
```

A maximum of two #10 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 oval break-away connections must use either a 4" (102) wide drawband or #10 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 48" (1219) total perimeter – Maximum 8 screws. For flat oval ducts, the diameter is considered the largest (major) dimension of the duct.

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

- Design Polymers – DP 1010
- Hardcast, Inc. – Iron Grip 601
- Eco Duct Seal 44-52

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION

TWO ANGLE INSTALLATION

FIGURE 1

HORIZONTAL INSTALLATION

TWO ANGLE INSTALLATION

FIGURE 2
FASTENER SPACING

HORIZONTAL INSTALLATION

6" (152)
Max. c-c

3" (76)
Max.

See Note 2
Mullion Plate
See Note 2

FIGURE 3

VERTICAL INSTALLATION

6" (152) or
12" (305)
Max. c-c

3" (76)
Max.

2" (51)
Max.

See Note 2

FIGURE 4

REINFORCING PLATE

No Mullion Plate Req'd

Mullion Required on 2 or more adjoining sections
See Note 2

FIGURE 5
DIBD20-CUL, DIBD40-CUL AND DIBD60-CUL
DYNAMIC CURTAIN FIRE DAMPERS
UL555 CLASSIFIED  1 ½ HR. RATING

FEATURES
• Dynamic fire dampers are produced in an ISO 9001 certified factory.

FRAME - SLEEVE LENGTHS
• DIBD20 – 12” (305) long
• DIBD40 – 14” (356) long
• DIBD60 – 16” (406) long

TRANSITIONS AND STYLES
• A Style – Frame and blades in the airstream
  o 75 to 85% free area
• B Style – Blades out of the airstream
  o 80 to 90% free area
  o Not air tight
• C Style – Blades and frame out of the airstream
  o Square or rectangular enclosure
  o 95 to 100% free area
  o Sealed assembly
• CR Style – Blades and frame out of the airstream
  o Round enclosure
  o 95 to 100% free area
  o Sealed assembly
• CO Style – Blades and frame out of the airstream
  o Oval enclosure
  o 95 to 100% free area
  o Sealed assembly

OPTIONS
• FM Approvals as Specification Tested Product.
• SP200 Switch Package to allow remote indication of damper blade position.
• FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
• Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

APPLICATION
Ruskin DIBD20-CUL, 40-CUL, 60-CUL (for the Canadian market) dynamic fire dampers provide point-of origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa)

Model DIBD series meets the requirements for fire dampers established by:
• ICC International Building Codes
• CSFM California State Fire Marshal Listing (#3225-0245:0005) DIBD20, 40 and 60
• New York City (MEA 252-05-E)

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
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<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½</td>
</tr>
<tr>
<td>DIBD40-CUL</td>
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<tr>
<td>DIBD60-CUL</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIBD20-CUL</td>
<td>4”w x 4”h (102 x 102)</td>
<td>6”w x 6”h (152 x 152)</td>
<td>33”w x 36”h (838 x 914)</td>
</tr>
<tr>
<td>DIBD40-CUL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIBD60-CUL</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
APPLICATION

Ruskin IBD20-CUL, 40-CUL and 60-CUL (for the Canadian market) static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of less than 3 hours. I80 series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245-0005) IBD20, 40 and 60
- New York City (MEA 252-05-E)

FEATURES

- Static fire dampers are produced in an ISO 9001 certified factory.

FRAME - SLEEVE LENGTHS

- IBD20-CUL - 12’ (305) long
- IBD40-CUL - 14’ (356) long
- IBD60-CUL - 16’ (406) long

TRANSITIONS AND STYLES

- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

OPTIONS

- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- FAST Angle factory supplied for labor saving angle one-side installation. Other angles of various sizes and gages also for one-side or two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) optional.

SPECIFICATIONS

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<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
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<tr>
<td>IBD20-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>1 ½ HR.</td>
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<tr>
<td>IBD40-CUL</td>
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<tr>
<td>IBD60-CUL</td>
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</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES*

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD20-CUL</td>
<td>4”w x 4”h</td>
<td>6”w x 6”h</td>
<td>33”w x 72”h (838 x 1829)</td>
</tr>
<tr>
<td>IBD40-CUL</td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>48”w x 30”h (1219 x 762)</td>
</tr>
<tr>
<td>IBD60-CUL</td>
<td></td>
<td></td>
<td>36”w x 36”h (914 x 914)</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
APPLICATION

The (D)IBD20-CUL, (D)IBD40-CUL, and (D)IBD60-CUL fire dampers include sleeves that are an integral part of the damper frame and are approved for installation without the need for a supplemental, field-installed sleeve. The fire damper models shown on this sheet are marked with a 1½ hour fire damper label and are approved for use in fire walls or masonry floors with ratings of less than 3 hours. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

STATIC FIRE DAMPERS

Not for use in Dynamic (fans on) Systems

MODELS IBD20-CUL, IBD40-CUL, and IBD60-CUL

MAXIMUM SIZE

Single Section
- Vertical Installation – 48”w x 30”h (1219 x 762) or 33”w x 72”h (838 x 1829) or 36”w x 36”h (814 x 914)
- Horizontal Installation – 30”w x 45½”h (762 x 1156) or 33”w x 38”h (838 x 965)

Multiple Section Assembly
- Vertical Installation – 120”w x 72”h (3048 x 1829)
- Horizontal Installation – 90”w x 91”h (2286 x 2311)

DYNAMIC FIRE DAMPERS

Use in Dynamic (fans on) or Static (fans off) Systems

MODELS DIBD20-CUL, DIBD40-CUL, and DIBD60-CUL

MAXIMUM SIZE

Single Section
- Vertical Installation – 33”w x 36”h (838 x 914)
- Horizontal Installation – 24”w x 24”h (610 x 610)

Multiple Section Assembly
- Vertical Installation – 72”w x 48”h (1828 x 1219) or 48”w x 72”h (1219 x 1828) or 120”w x 24”h (3048 x 610)
- Horizontal Installation – Refer to “X” models below.

MODELS DIBD20X-CUL, DIBD40X-CUL, and DIBD60X-CUL

MAXIMUM SIZE

Single Section
- Vertical Installation – 18”w x 24”h (457 x 610)
- Horizontal Installation – 18”w x 24”h (457 x 610) or 24”w x 18”h (610 x 457)

Multiple Section Assembly
- Horizontal Installation – 36”w x 48”h (914 x 1219) or 48”w x 36”h (1219 x 914)

Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.
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 1/16" 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 1/16" (6) larger than the damper/sleeve assembly. For one angle installations, the opening shall be a minimum of 1/16" (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

Use No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:

- **Vertical Mount (In wall)**
  - Galvanized steel dampers: 12" (305) spacing
  - Horizontal Mount (In floor):
    - All dampers: 6" (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4/16" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/16" (13) long welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation

Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic DIBD and DIBDX models for proper damper orientation. For Static IBX models use only "Mount With Arrow Up" label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles

Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls or concrete/masonry walls and floors 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 side of the floor. The angles must be attached to both the sleeve and the wall or floor. Mounting angles may be installed directly to the wall board on metal stud wall installations only. Larger openings 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 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" (5) 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 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:

- **PLAIN 5/8 SLIP**
- **HEMDED 5/8 SLIP**
- **DOUBLE 5/8 SLIP**
- **INSIDE SLIP JOINT**
- **STANDING 5/8 (ANGLE REINFORCED)**
- **STANDING 5/8 (BAR REINFORCED)**
- **STANDING 5/8 (STANDING ALT)**
- **DRIVE SLIP JOINT**

A maximum of two #10 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 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.

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

- **Design Polymers – DP 1010**
- **Hardcast, Inc. – Iron Grip 601**
- **Precision – PA2084T**
- **Eco Duct Seal 44-52**

Notes: (914) total perimeter – Maximum 8 screws. For flat oval ducts, the diameter is considered the largest (major) dimension of the duct.

C. Flanged Break-away Style Duct Sleeve Connections

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

TDC and TDF roll-formed flanged connections using 3/16" (10) steel bolts and nuts, and metal cleats, as tested by SMACNA, are approved break-away connections when installed as shown on the Flanged System 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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the wall.

TWO ANGLE INSTALLATION

ONE ANGLE INSTALLATION

FIGURE 1

HORIZONTAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the wall.

TWO ANGLE INSTALLATION

ONE ANGLE INSTALLATION

FIGURE 2
DIBD23-CUL AND DIBD23SS DYNAMIC CURTAIN FIRE DAMPER
UL555 CLASSIFIED
3 HR. RATING

APPLICATION
Ruskin DIBD23(SS)-CUL (for the Canadian market) series dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

Features
- Dynamic fire dampers are produced in an ISO 9001 certified factory.

Transitions and Styles
- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

Options
- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Welded Construction for BC, WC, WR and WO Transition Styles.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

Specifications

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIBD23-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
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<td>DIBD23SS-CUL</td>
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Maximum UL Classified Damper Sizes

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<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section**</th>
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<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
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<tr>
<td>DIBD23-CUL</td>
<td>4&quot;w x 4&quot;h (102 x 102)</td>
<td>6&quot;w x 6&quot;h (152 x 152)</td>
<td>33&quot;w x 36&quot;h (838 x 914)</td>
</tr>
<tr>
<td>DIBD23SS-CUL</td>
<td>24&quot;w x 24&quot;h (610 x 610)</td>
<td>24&quot;w x 24&quot;h (610 x 610)</td>
<td>48&quot;w x 72&quot;h (1219 x 1829)</td>
</tr>
</tbody>
</table>

* Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa).
** See product data sheets for more details on single and multiple section sizing.
IBD23(SS)-CUL STATIC CURTAIN FIRE DAMPERS UL555 CLASSIFIED
3 HR. RATING

APPLICATION
Ruskin IBD23(SS)-CUL (for the Canadian market) series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. IBD series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0004) IBD23 and IBD23SS
- New York City (MEA 252-05-E)

FEATURES
- Static fire dampers are produced in an ISO 9001 certified factory.

TRANSITIONS AND STYLES
- A Style – Frame and blades in the airstream
  o 75 to 85% free area
- B Style – Blades out of the airstream
  o 80 to 90% free area
  o Not air tight
- C Style – Blades and frame out of the airstream
  o Square or rectangular enclosure
  o 95 to 100% free area
  o Sealed assembly
- CR Style – Blades and frame out of the airstream
  o Round enclosure
  o 95 to 100% free area
  o Sealed assembly
- CO Style – Blades and frame out of the airstream
  o Oval enclosure
  o 95 to 100% free area
  o Sealed assembly

OPTIONS
- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Welded Construction for BC, WC, WR and WO Transition Styles.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) optional.

SPECIFICATIONS

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<thead>
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<th>Frame</th>
<th>Blades</th>
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<th>Hourly Rating</th>
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<td>Galvanized Steel (in gages required by UL listing R5531)</td>
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MAXIMUM UL CLASSIFIED DAMPER SIZES*

<table>
<thead>
<tr>
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<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
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</thead>
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<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD23-CUL</td>
<td>4&quot;w x 4&quot;h</td>
<td>6&quot;w x 6&quot;h</td>
<td>36&quot;w x 36&quot;h</td>
</tr>
<tr>
<td></td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(914 x 914)</td>
</tr>
<tr>
<td>IBD23SS-CUL</td>
<td>4&quot;w x 4&quot;h</td>
<td>6&quot;w x 6&quot;h</td>
<td>36&quot;w x 36&quot;h</td>
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<tr>
<td></td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(914 x 914)</td>
</tr>
</tbody>
</table>

|          | Vertical       | Horizontal             | Vertical                 | Horizontal               |
| IBD23-CUL| 90"w x 72"h    | 90"w x 91"h            | 90"w x 72"h              | 90"w x 91"h              |
|          | (2286 x 1829)  | (2286 x 2311)          | (2286 x 1829)            | (2286 x 2311)            |

* See product data sheets for more details on single and multiple section sizing.
INSTALLATION INSTRUCTIONS

3 HOUR UL CLASSIFIED CURTAIN TYPE FIRE DAMPERS
MODEL (D)IBD23-CUL, (D)IBD23SS-CUL

APPLICATION
The (D)IBD23-CUL carries a 3 hour fire damper label and is approved for use in fire walls or masonry floors with ratings of 3 hours or more. Fire Dampers require a field- or factory-installed sleeve. Select a sleeve of sufficient length to permit attachment, with perimeter mounting angles, to duct work on each side of wall or floor opening. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

MODEL IBD230-CUL MAXIMUM SIZE
Single Section
- Vertical Installation – 36"w x 36"h (914 x 914).
- Horizontal Installation – 30"w x 45½"h (762 x 1156).
Multiple Section Assembly
- Vertical Installation – 90"w x 72"h (2286 x 1829).
- Horizontal Installation – 90"w x 91"h (2286 x 2311).

MODEL IBD23SS-CUL MAXIMUM SIZE
Single Section
- Vertical Installation – 36"w x 36"h (914 x 914).
- Horizontal Installation – 30"w x 45½"h (762 x 1156).
Multiple Section Assembly
- Vertical Installation – 90"w x 72"h (2286 x 1829).
- Horizontal Installation – 90"w x 91"h (2286 x 2311).

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

MODEL DIBD23-CUL MAXIMUM SIZE
Single Section
- Vertical Installation – 33"w x 36"h (838 x 914).
- Horizontal Installation – 24"w x 24"h (610 x 610).
Multiple Section Assembly
- Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 90"w x 24"h (2286 x 610)

MODEL DIBD23X-CUL MAXIMUM SIZE
Single Section
- Horizontal Installation – 18"w x 24"h (457 x 610) or 24"w x 18"h (610 x 457).
Multiple Section Assembly
- Horizontal Installation – 36"w x 48"h (914 x 1219) or 48"w x 36"h (1219 x 914).

MODEL DIBD23SS-CUL MAXIMUM SIZE
Single Section
- Vertical or Horizontal Installation – 24"w x 24"h (610 x 610).
Multiple Section Assembly
- Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 90"w x 24"h (2286 x 610).

Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

INSTALLATION SUPPLEMENTS
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:
- Optional Sealant of Dampers in Fire Rated Walls 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 Dampers Installation in Concrete Floor with Steel Deck
- Drivemate No. 14880 Breakaway Connection
- Flanged System Breakaway Connections

California State Fire Marshal Listing No. 3225-245:004

Click to Return to: INDEX FSD SD IBD/DFD CFD

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1. Opening Clearance

The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. The opening shall be a minimum of $\frac{1}{8}$" per foot (3 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed $\frac{1}{6}$" per foot (3 per 305) plus 2" (51), nor shall the opening be less than $\frac{1}{32}$" (6) larger than the damper/sleeve assembly.

2. Fasteners and Multiple Section Assembly

Use No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:

- Vertical Mount (In wall)
  - All dampers: 6" (152) spacing
- Horizontal Mount (In floor)
  - All dampers: 6" (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4 1/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/2" (13) long welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation

Use “Air Flow” and “Mount with Arrow Up” labels on Dynamic IBD models for proper damper orientation. For Static IBD models use only “Mount With Arrow Up” label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles

Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0) 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 dampers may be installed using Ruskin PFMA.
- Use No. 10 (M5) bolts or screws, 3/16" (5) rivets or 1/2" (13) long welds.
- Masonry/Wall or Floor: #10 self-tapping concrete screws.
- Wood/Steel Stud Wall: #10 screws

6. Duct/Sleeve Connections

a. Break-away Duct/Sleeve Connections

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

- PLAIN "S" SLIP
- HEMMED "S" SLIP
- DOUBLE "S" SLIP
- INSIDE SLIP JOINT
- STANDING S (ANGLE REINFORCED)
- STANDING ALT
- STANDING S (MM REINFORCED)
- STANDING S (ANGLE REINFORCED)
- DRIVE SLIP JOINT

A maximum of two #10 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 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.

Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer's instructions:
- Design Polymers – DP 1010
- Hardcast, Inc. – Eco Grip 601
- TDC and TDF roll-formed flanged connections using 3/16" (10) steel bolts and nuts, and metal cleats, as tested by SMACNA, are approved break-away connections when installed as shown on the Flanged System Breakaway Connections Supplement.
- Non-Break-away Duct/Sleeve Connections

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

7. Installation and Maintenance

To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the wall.

HORIZONTAL INSTALLATION
Damper is properly installed when leading edge of closed blades is within the floor.
FASTENER SPACING

HORIZONTAL INSTALLATION

6" (152) Max. c-c

3" (76) Max.

Mullion Plate
See Note 2

See Note 2

Mullion Plate
See Note 2

VERTICAL INSTALLATION

6" (152) Max. c-c

3" (76) Max.

6" (152) or 12" (305) Max. c-c

2" (51) Max.

See Note 2

REINFORCING PLATE

No Mullion Plate Req’d

Mullion Required on 2 or more adjoining sections
See Note 2

No Mullion Plate Req’d

Figure 3

Figure 4

Figure 5
Ruskin DIBD230-CUL, 430-CUL, 630-CUL (for the Canadian market) dynamic fire dampers provide point-of-origin fire containment. Dynamic fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. DIBD series dampers are classified as a dynamic damper for use in an HVAC system that remains in operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. wg (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:
- ICC International Building Codes
- CSFM California State Fire Marshal
- New York City (MEA 252-05-E)

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIBD230-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>3</td>
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<tr>
<td>DIBD430-CUL</td>
<td>Galvanized Steel</td>
<td>Galvanized Steel</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>3</td>
</tr>
<tr>
<td>DIBD630-CUL</td>
<td>Galvanized Steel</td>
<td>Galvanized Steel</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>3</td>
</tr>
</tbody>
</table>

### MAXIMUM UL CLASSIFIED DAMPER SIZES*

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DIBD230-CUL</td>
<td>4&quot;w x 4&quot;h</td>
<td>6&quot;w x 6&quot;h</td>
<td>33&quot;w x 36&quot;h</td>
</tr>
<tr>
<td></td>
<td>(102 x 102)</td>
<td>(152 x 152)</td>
<td>(838 x 914)</td>
</tr>
<tr>
<td>DIBD430-CUL</td>
<td>48&quot;w x 72&quot;h</td>
<td>48&quot;w x 72&quot;h</td>
<td>48&quot;w x 72&quot;h</td>
</tr>
<tr>
<td></td>
<td>(1219 x 1829)</td>
<td>(1219 x 1829)</td>
<td>(1219 x 1829)</td>
</tr>
<tr>
<td>DIBD630-CUL</td>
<td>48&quot;w x 72&quot;h</td>
<td>48&quot;w x 72&quot;h</td>
<td>48&quot;w x 72&quot;h</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
Ruskin IBD230-CUL, 430-CUL and 630-CUL (for the Canadian market) series static fire dampers provide point-of-origin fire containment. Static fire dampers may be installed vertically in walls or horizontally in concrete/masonry floors with fire resistance rating of 3 hours or more. IBD series dampers are classified as a static damper for use in an HVAC system that the fans turn off during a fire.

**APPLICATION**

Model IBD series meets the requirements for fire dampers established by:

- ICC International Building Codes
- CSFM California State Fire Marshal Listing (#3225-0245:0004) IBD230, 430 and 630
- New York City (MEA 252-05-E)

**FEATURES**

- Static fire dampers are produced in an ISO 9001 certified factory.

**FRAME - SLEEVE LENGTHS**

- IBD230-CUL – 12’ (305) long
- IBD430-CUL – 14’ (356) long
- IBD630-CUL – 16’ (460) long

**TRANSITIONS AND STYLES**

- A Style – Frame and blades in the airstream
  - 75 to 85% free area
- B Style – Blades out of the airstream
  - 80 to 90% free area
  - Not air tight
- C Style – Blades and frame out of the airstream
  - Square or rectangular enclosure
  - 95 to 100% free area
  - Sealed assembly
- CR Style – Blades and frame out of the airstream
  - Round enclosure
  - 95 to 100% free area
  - Sealed assembly
- CO Style – Blades and frame out of the airstream
  - Oval enclosure
  - 95 to 100% free area
  - Sealed assembly

**OPTIONS**

- FM Approvals as Specification Tested Product.
- SP200 Switch Package to allow remote indication of damper blade position.
- PFMA Angle factory supplied for labor saving angle two-side installation. Other angles of various sizes and gages also for two-side installation.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) optional.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBD230-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>3</td>
</tr>
<tr>
<td>IBD430-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>3</td>
</tr>
<tr>
<td>IBD630-CUL</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type</td>
<td>3</td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>IBD230-CUL</td>
<td>4’w x 4”h</td>
<td>36”w x 36”h (914 x 914)</td>
<td>84”w x 72”h (2134 x 1829)</td>
</tr>
<tr>
<td>IBD430-CUL</td>
<td>6”w x 6”h</td>
<td>36”w x 36”h (914 x 914)</td>
<td>84”w x 72”h (2134 x 1829)</td>
</tr>
<tr>
<td>IBD630-CUL</td>
<td>6”w x 6”h</td>
<td>36”w x 36”h (914 x 914)</td>
<td>84”w x 72”h (2134 x 1829)</td>
</tr>
</tbody>
</table>

* See product data sheets for more details on single and multiple section sizing.
INSTALLATION INSTRUCTIONS
3 HOUR UL CLASSIFIED
CURTAIN TYPE (D)IBD230-CUL, (D)IBD430-CUL, and (D)IBD630-CUL
FIRE DAMPER WITH INTEGRAL SLEEVES

APPLICATION
The (D)IBD230-CUL, (D)IBD430-CUL, and (D)IBD630-CUL fire dampers include sleeves that are an integral part of the damper frame and are approved installation without the need for a supplemental, field-installed sleeve. Select the damper with sufficient length to permit attachment, with perimeter mounting angles, to ductwork to each side of wall or floor opening. The fire damper models shown on this sheet are marked with a 1 ½ hour fire damper label and are approved for use in fire walls or masonry floors with ratings of less than 3 hours. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems
MODELS IBD230-CUL, IBD430-CUL, and IBD630-CUL
MAXIMUM SIZE
Single Section
Vertical Installation – 36"w x 36"h (914 x 914).
Horizontal Installation – 30"w x 45½"h (762 x 1156).
Multiple Section Assembly
Vertical Installation – 90"w x 72"h (2286 x 1829).
Horizontal Installation – 90"w x 91"h (2286 x 2311).

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems
MODELS DIBD230-CUL, DIBD430-CUL, and DIBD630-CUL
MAXIMUM SIZE
Single Section
Vertical Installation – 33"w x 36"h (838 x 914)
Horizontal Installation – 24"w x 24"h (610 x 610)
Multiple Section Assembly
Vertical Installation – 72"w x 48"h (1828 x 1219) or 48"w x 72"h (1219 x 1828) or 90"w x 24"h (2286 x 610)

MODELS DIBD230X-CUL, DIBD430X-CUL, and DIBD630X-CUL
MAXIMUM SIZE
Single Section
Horizontal Installation – 18"w x 24"h (457 x 610) or 24"w x 18"h (610 x 457)
Multiple Section Assembly
Horizontal Installation – 36"w x 48"h (914 x 1219) or 48"w x 36"h (1219 x 914)

Notes:
1. Dimensions shown in parentheses ( ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

INSTALLATION SUPPLEMENTS
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:
• Optional Sealant of Dampers in Fire Rated Walls or Floor Openings
• Transfer Openings and Duct Terminations for 1½ Hour and 3 Hour Fire Dampers
• Optional FireStop Material
• Extension of Fire and Combination Fire and Smoke Damper Sleeves
• Fire and Combination Fire and Smoke Dampers Installation in Concrete Floor with Steel Deck
• Drivemate No. 14880 Breakaway Connections
• Flanged System Breakaway Connections

California State Fire Marshal Listing No. 3225-245:004
CLASSIFIED
SEE COMPLETE MARKING ON PRODUCT
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation or expansion. 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 1/4" per foot (3 per 305) plus 2" (51), nor shall the opening be less than 1/4" (6) larger than the damper/sleeve assembly.

2. Fasteners and Multiple Section Assembly
Use No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds as depicted in figures 3 and 4 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:
- Vertical Mount (In wall)
  - All dampers 6" (152) spacing
- Horizontal Mount (In floor)
  - All dampers 6" (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4 1/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with 1/2" (13) long welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 5.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 a factory installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation
Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic DIBD models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation. Static and Dynamic dampers must be installed with leading edge of the closed blades within the wall or floor.

5. Mounting Angles
Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0) 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 dampers may be installed using Ruskin PFMA.

a. Mounting Angle Fasteners
- Sleeve: #10 bolts or screws, 3/16" (5) 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
Fasteners shall be spaced at 6" (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 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 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.

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
- Hardcast, Inc. – Iron Grip 601
- TDC Flanged connection systems manufactured by Ductmate, Nexus or Ward are approved break-away connections when installed as shown on the Flanged System 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 System Breakaway Connections Supplement.

c. Non-Break-away Duct/Sleeve Connections
If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
**VERTICAL INSTALLATION**

Damper is properly installed when leading edge of closed blade is within the wall.

![Diagram of vertical installation](image1)

**FIGURE 1**

**HORIZONTAL INSTALLATION**

Damper is properly installed when leading edge of closed blade is within the wall.

![Diagram of horizontal installation](image2)

**FIGURE 2**
FIGURE 3

FASTENER SPACING

VERTICAL INSTALLATION

HORIZONTAL INSTALLATION

FIGURE 4

REINFORCING PLATE

FIGURE 5

Mullion Required on 2 or more adjoining sections
See Note 2

No Mullion Plate Req'd

See Note 2

6" (152) Max.c-c

3" (76) Max.

Mullion Plate
See Note 2

See Note 2

6" (152) Max.c-c

2" (51) Max.

6" (152) Max.c-c

3" (76) Max.

FIGURE 5

Click to Return to: INDEX FSD SD IBD/DFD CFD
Application

Ruskin Grille Access “GA” series fire dampers designed to be installed from the grille side of the wall and the blades are outside the plane of the wall. These dampers allow through the grille access to the damper and fuse link and are ideally suited for shaft wall applications. The GA series dampers may be installed vertically in walls with fire resistance rating of less than 3 hours and are rated for airflow in either direction.

Features

- Fire dampers are produced in an ISO 9001 certified factory.

Options

- FM Approvals as Specification Tested Product.
- Switch Package to allow remote indication of damper blade position.
- Fusible Links 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

Note: Grilles by others

UL555 1 ½ Hr. Rating

GA Models meets the requirements for fire dampers established by:
- ICC International Building Codes

Specifications

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>(D)FD60GA</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>One-piece airfoil, nominal 6' (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>301 stainless steel</td>
<td>1 ½</td>
</tr>
<tr>
<td>(D)FD35GA</td>
<td>5&quot; x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>6' (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>301 stainless steel</td>
<td></td>
</tr>
<tr>
<td>(D)FD35SS/GA</td>
<td>5&quot; x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel.</td>
<td>6' (152) wide and 16 (1.6) gage stainless steel.</td>
<td>301 stainless steel</td>
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<tr>
<td>(D)IBD2/GA</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type (where applicable)</td>
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<tr>
<td>(D)IBD2SS/GA</td>
<td>304 Stainless Steel (in gages required by UL listing R5531)</td>
<td>304 Stainless Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type (where applicable)</td>
<td></td>
</tr>
</tbody>
</table>

Maximum UL Classified Damper Sizes

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>All Models</td>
<td>6&quot;w x 6&quot;h (152 x 152)</td>
<td>36&quot;w x 36&quot;h (914 x 914)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* See products data sheets for more details on single and multiple section sizing.
APPLICATION

The DIBD2GA and DIBD2SSGA dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. The IBD2GA and DIBD2SSGA static fire dampers are for use in static (fans off) systems only. Grille access “GA” fire dampers are designed to be installed from one side of the wall or partition and permits access to the damper fusible link through the wall grille. GA fire dampers may be used in fire resistance rating applications of less than 3 hours.

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

MODEL DIBD2GA MAXIMUM SIZE
Single Section
  Vertical Installation – 33"w x 36"h (838 x 914)
Multiple Section Assembly
  Vertical Installation – 36"w x 36"h (914 x 914)

MODEL DIBD2SSGA MAXIMUM SIZE
Single Section
  Vertical Installation – 24"w x 24"h (610 x 610)
Multiple Section Assembly
  Vertical Installation – 36"w x 36"h (914 x 914)

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

MODEL IBD2GA and IBD2SS/ GA MAXIMUM SIZE
Single Section
  Vertical Installation – 36"w x 36"h (914 x 914)

Note: Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS

Refer to the Ruskin installation instruction supplements for additional information or special requirements:
• Optional Sealant of Dampers in Fire Rated Wall or Floor Openings
• Transfer Openings and Duct Terminations
• Flanged System Breakaway Connections
• Cavity Shaft Wall Metal Stud Framing

SEE COMPLETE MARKING ON PRODUCT

California State Fire Marshal Listing No. 3225-245:005
1. Opening Clearance

Opening clearance for expansion is not required for the Grille Access dampers. However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 241/2" x 201/2" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation

Dampers are designed to operate with blades running horizontally. Use "Mount With Arrow Up" label as a guide for proper damper orientation. The maximum the leading edge of the damper frame can be installed outside the wall:
- Steel Stud or Masonry Walls: 8" (203)
- Wood Stud Walls: 6" (152)

3. Insulation

Insulation shall be 1/4" (6) fiberfrax attached to all four sides of the damper and sleeve assembly (factory installed)

4. Damper Sleeve

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

5. Fasteners

a. Fasteners spacing to attach the damper sleeve to the wall, minimum of 1 fastener per side.
   - Steel Stud or Masonry Walls: 12" (305) c-to-c
   - Wood Stud Wall: 6" (152) c-to-c

b. Fastener to attach damper sleeve to the wall or floor
   In masonry walls use minimum #10 self-tapping concrete anchors. Screw must engage the wall or floor a minimum of 11/2" (38)
   In metal stud walls use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 1/2" (13)
   In wood stud walls use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).

6. Mounting Angles

Grille mounting flange is integral with the damper sleeve. No other mounting angles are required on front or backside of sleeve.

7. Duct/Sleeve Connection

a. Break-away Duct/Sleeve Connections

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

   ![Duct/Sleeve Connections Diagram]

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 Polymeric – 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 and roll-formed flanged connection by TDF and TDC are approved breakaway connections. Connection between manufactured systems may be used with metal or plastic cleats, Butyl or neoprene gaskets, and/or bolted or non-bolted corners. See Flanged System Breakaway Connections Installation Instruction Supplement for details.

d. Non-Break-away Duct/Sleeve Connections

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

8. Installation and Maintenance

Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Dampers must be maintained, cycled, and tested in accordance with local codes and recognized standards or publications like NFPA 80, 90A, 101, etc.
### VERTICAL INSTALLATION

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Wall: steel or wood stud or masonry</td>
</tr>
<tr>
<td>2.</td>
<td>Damper</td>
</tr>
<tr>
<td>3.</td>
<td>¾&quot; (6) thick insulation (Factory Installed)</td>
</tr>
<tr>
<td>4.</td>
<td>Grille – “By Others”</td>
</tr>
<tr>
<td>5.</td>
<td>Fasteners – See Note #5</td>
</tr>
<tr>
<td>6.</td>
<td>Duct/Sleeve connection</td>
</tr>
</tbody>
</table>

### OPTIONAL INSTALLATION

Optional installation depicts "G" Style fire damper that is installed in the wall. When installed within the wall as depicted the damper does not need the added insulation that an "out of wall" damper requires.

<table>
<thead>
<tr>
<th>ITEM</th>
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</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Wall: steel or wood stud or masonry</td>
</tr>
<tr>
<td>2.</td>
<td>Damper</td>
</tr>
<tr>
<td>3.</td>
<td>Grille – “By Others”</td>
</tr>
<tr>
<td>4.</td>
<td>Fasteners – See Note #5</td>
</tr>
<tr>
<td>5.</td>
<td>Duct/Sleeve connection</td>
</tr>
</tbody>
</table>
APPLICATION

The DFD35GA, DFD35SSGA and DFD60GA dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. The FD35GA, FD35SSGA and FD60GA static fire dampers are for use in static (fans off) systems only. Grille access “GA” fire dampers are designed to be installed from one side of the wall or partition and permits access to the damper fusible link through the wall grille. GA fire dampers may be used in fire resistance rating applications of less than 3 hours.

DYNAMIC FIRE DAMPERS

Use in Dynamic (fans on) or Static (fans off) Systems

(D)FD35GA MAXIMUM UL CLASSIFIED SIZES –
Single section vertical installation
36"w x 36"h (914 x 914)

(D)FD35SSGA MAXIMUM UL CLASSIFIED SIZES –
Single section vertical installation
30"w x 36"h (762 x 914)

(D)FD60GA MAXIMUM UL CLASSIFIED SIZES –
Single section vertical installation
32"w x 36"h (813 x 914)

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS

Refer to the Ruskin installation instruction supplements for additional information or special requirements:
• Optional Sealant of Dampers in Fire Rated Wall or Floor Openings
• Transfer Openings and Duct Terminations
• Flanged System Breakaway Connections
• Cavity Shaft Wall Metal Stud Framing
• SP100 Switch Package

California State Fire Marshal Listing No.
FD35GA – 3225-0245:0005
FD35SSGA – 3225-0245:0005
FD60GA – 3225-0245:0004

SEE COMPLETE MARKING ON PRODUCT
1. Opening Clearance
Opening clearance for expansion is not required for the Grille Access dampers. However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 241/2" x 201/2" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation
Dampers are designed to operate with blades running horizontally. Use 'Mount With Arrow Up' label as a guide for proper damper orientation. The maximum the leading edge of the damper frame can be installed outside the wall:
- Steel Stud or Masonry Walls: 8" (203)
- Wood Stud Walls: 6" (152)

3. Insulation
Insulation shall be 1/4" (6) fiberfrax attached to all four sides of the damper and sleeve assembly (factory installed)

4. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

5. Fasteners
   a. Fasteners spacing to attach the damper sleeve to the wall, minimum of 1 fastener per side.
      - Steel Stud or Masonry Walls: 12" (305) c-to-c
      - Wood Stud Wall: 6" (152) c-to-c
   b. Fastener to attach damper sleeve to the wall or floor
      In masonry walls use minimum #10 self-tapping concrete anchors. Screw must engage the wall or floor a minimum of 11/2" (38)
      In metal stud walls use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 1/2" (13)
      In wood stud walls use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).

6. Mounting Angles
Grille mounting flange is integral with the damper sleeve. No other mounting angles are required on front or backside of sleeve.

7. Duct/Sleeve Connection
   a. Break-away Duct/Sleeve Connections
      Rectangular ducts must use one or more of the connections depicted below:

      ![Diagram of various duct/sleeve connections]

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

   c. Flanged Break-away Style Duct/Sleeve Connections
      Flanged connection systems manufactured by Ductmate, Nexus or Ward and roll-formed flanged connection by TDF and TDC are approved breakaway connections. Connection between manufactured systems may be used with metal or plastic cleats, Butyl or neoprene gaskets, and/or bolted or non-bolted corners. See Flanged System Breakaway Connections Installation Instruction Supplement for details.

   d. Non-Break-away Duct/Sleeve Connections
      If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

8. Installation and Maintenance
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Dampers must be maintained, cycled, and tested in accordance with local codes and recognized standards or publications like: NFPA 80, 90A, 101, etc.
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Wall: steel or wood stud or masonry</td>
</tr>
<tr>
<td>2.</td>
<td>Damper</td>
</tr>
<tr>
<td>3.</td>
<td>1/4&quot; (6) thick insulation (Factory Installed)</td>
</tr>
<tr>
<td>4.</td>
<td>Grille – “By Others”</td>
</tr>
<tr>
<td>5.</td>
<td>Fasteners – See Note #5</td>
</tr>
<tr>
<td>6.</td>
<td>Duct/Sleeve connection</td>
</tr>
</tbody>
</table>
Application

Ruskin Out of Wall/Floor “OW” series fire dampers designed to be installed with the damper up to 8” out of the wall or floor. These dampers allow through the grille access to the damper and fuse link and are ideally suited for shaft wall applications. The OW series dampers may be installed horizontally in walls or horizontally in concrete/masonry floors and are rated for airflow in either direction.

FEATURES

- Fire dampers are produced in an ISO 9001 certified factory.

OPTIONS

- **FM Approvals** as Specification Tested Product.
- **Switch Package** to allow remote indication of damper blade position.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>(D)FD60/OW</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>One-piece airfoil, nominal 6” (152) wide and 14 (2.0) gage galvanized steel equivalent thickness.</td>
<td>301 stainless steel</td>
<td>1 1/2</td>
</tr>
<tr>
<td>(D)FD35/OW</td>
<td>5” x 16 gage (127 x 1.6) galvanized, single piece, hat-shaped channel.</td>
<td>6” (152) wide and 16 (1.6) gage galvanized steel.</td>
<td>301 stainless steel</td>
<td></td>
</tr>
<tr>
<td>(D)FD35SS/OW</td>
<td>5” x 16 gage (127 x 1.6) stainless steel, single piece, hat-shaped channel.</td>
<td>6” (152) wide and 16 (1.6) gage stainless steel.</td>
<td>301 stainless steel</td>
<td></td>
</tr>
<tr>
<td>(D)IBD2/OW</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type (where applicable)</td>
<td></td>
</tr>
<tr>
<td>(D)IBD2SS/OW</td>
<td>304 Stainless Steel (in gages required by UL listing R5531)</td>
<td>304 Stainless Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel constant force or spring clip type (where applicable)</td>
<td></td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Models</td>
<td>6&quot;w x 6&quot;h (152 x 152)</td>
<td>36&quot;w x 36&quot;h (914 x 914)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* See products data sheets for more details on single and multiple section sizing.
APPLICATION
The DIBD2/OW and DIBD2SS/OW dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. The IB2D2/OW and IB2DSS/OW static fire dampers are for use in static (fans off) systems only. Out of wall “OW” fire dampers are designed so that the leading edge of the damper frame can be up to 8” (203) out of the wall, partition or masonry floor. OW fire dampers may be used in fire resistance rating applications of less than 3 hours. OW fire dampers may be used for through penetrations or duct terminations where the damper cannot be installed within the wall or floor.

STATIC FIRE DAMPERS
Not for use in Dynamic (fans on) Systems

MODEL IBD2/OW and IBD2SS/OW MAXIMUM SIZE
Single Section
  Vertical Installation – 36” w x 36” h (914 x 914)
  Horizontal Installation – 30” w x 36” h (762 x 914)
Multiple Section Assembly
  Horizontal Installation – 36” w x 36” h (914 x 914)

DYNAMIC FIRE DAMPERS
For use in Dynamic (fans on) or Static (fans off) Systems

MODEL DIBD2/OW MAXIMUM SIZE
Single Section
  Vertical Installation – 33” w x 36” h (838 x 914)
  Horizontal Installation – 24” w x 24” h (610 x 610)
Multiple Section Assembly
  Vertical Installation – 38” w x 36” h (914 x 914)

MODEL DIBD2SS/OW MAXIMUM SIZE
Single Section
  Vertical Installation – 24” w x 24” h (610 x 610)
Multiple Section Assembly
  Vertical Installation – 36” w x 36” h (914 x 914)

MODEL DIBDX2/OW MAXIMUM SIZE
Single Section
  Vertical Installation – 18” w x 24” h (457 x 610)
  Horizontal Installation – 18” w x 24” h (457 x 610) or 24” w x 18” h (610 x 457)
Multiple Section Assembly
  Horizontal Installation – 36” w x 36” h (914 x 914)

Dimensions shown in parentheses ( ) indicate millimeters.
1. Opening Clearance
Opening clearance for expansion is not required for the Out of Wall or Floor dampers. However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 24 1/2" x 20 1/2" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation
Dampers are designed to operate with blades running horizontally. Use “Mount With Arrow Up” label as a guide for proper damper orientation. The maximum the leading edge of the damper frame can be installed outside the wall:
- Steel Stud or Masonry Walls: 8" (203)
- Wood Stud Walls: 6" (152)

3. Insulation
Insulation shall be 1/4" (6) fiberfaced attached to all four sides of the damper and sleeve assembly (factory installed).

4. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 90A. If a breakaway style duct/sleeve connection is not used, the Sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (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 the damper is equipped with an actuator and/or factory installed access door. Sleeve shall extend up to 16" (406) beyond the firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

5. Fasteners
a. Fasteners spacing to attach the mounting angles or damper sleeve to the wall or floor and mounting angles to the damper frame, minimum of 1 fastener per side.
   - Steel Stud or Masonry Walls: 12" (305) c-to-c
   - Wood Stud Walls: 6" (152) c-to-c
b. Fastener to attach mounting angles to the wall or floor.
   - In masonry walls and floors use minimum #10 self-tapping concrete anchors. Screw must engage the wall or floor a minimum of 1 1/2" (38).
   - In metal stud walls use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 1 1/2" (13).
   - In wood stud walls use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).
c. Fastener to attach mounting angles to the damper sleeve.
   - Mounting angles to be connected to the damper sleeve with minimum of number 10 (M5) screws on bolts, tack welds or 1/2" (13) long welds.

6. Mounting Angles
a. Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0). Ruskin “FAST” angle or only a single conventional mounting angle is required on side opposite of the damper and fastened to the damper sleeve and wall or floor. Do not weld or fasten conventional angles together at the corners of damper.
b. Optional installation where the damper is larger than the opening in the wall, the mounting angle is not required and the damper is to be fastened to the wall from the inside of the damper sleeve. Mounting angles may be used but are not required.
c. Optional installation where the damper is larger than the opening in the floor and the damper is mounted on the top side of the floor, the mounting angle is not required and the damper is to be fastened to the floor from the inside of the damper sleeve. Mounting angles may be used but are not required.
d. Optional installation where the damper is larger than the opening in the floor and the damper is mounted on the bottom side of the floor, a minimum of 1/2" x 1 1/2" x 20 gage steel (38 x 38 x 1.0) mounting angle is required on the top side of the floor fastened to the damper sleeve and floor.

7. Duct/Sleeve Connection
a. Break-away Duct/Sleeve Connection
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 Connection
Round and flat oval break-away connections may use either a 4" (102) wide drive joint 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 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
- Flanged Break-away Style Duct/Sleeve Connection
Flanged connection systems manufactured by Ductmate, Nexus or Ward and roll-formed flanged connection by TDF and TDC are approved breakaway connections. Connection between manufactured systems may be used with metal or plastic cleats, Butyl or neoprene gaskets, and/or bolted or non-bolted corners. See Flanged System Breakaway Connections Installation Instruction Supplement for detail.

d. Non-Break-away Duct/Sleeve Connection
If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

8. Installation and Maintenance
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Dampers must be maintained, cycled, and tested in accordance with local codes and recognized standards or publications like: NFPA 80, 90A, 101, etc.
VERTICAL INSTALLATION

ITEM DESCRIPTION
1. Wall: steel or wood stud or masonry
2. Damper
3. 1/4" (6) thick insulation (Factory Installed)
4. Fasteners – See Note #5
5. Duct/Sleeve connection
6. Mounting Angles – See Note #6
7. Grille (By Others) Optional

OPTIONAL VERTICAL INSTALLATION
HORIZONTAL INSTALLATION

ITEM DESCRIPTION
1. Floor/Ceiling masonry
2. Damper
3. 1/4" (6) thick insulation (Factory Installed)
4. Fasteners – See Note #5
5. Duct/Sleeve connection
6. Mounting Angles – See Note #6
7. Grille (By Others) Optional

OPTIONAL HORIZONTAL INSTALLATION

See detail A
APPLICATION
The DFD35/OW, DFD35SS/OW and DFD60/OW dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. The FD35/OW, FD35SS/OW and FD60/OW static fire dampers are for use in static (fans off) systems only. Out of wall "OW" fire dampers are designed so that the leading edge of the damper frame can be up to 8" (203) out of the wall, partition or masonry floor. OW fire dampers may be used in fire resistance rating applications of less than 3 hours. OW fire dampers may be used for through penetrations or duct terminations where the damper cannot be installed within the wall or floor.

DYNAMIC FIRE DAMPERS
Use in Dynamic (fans on) or Static (fans off) Systems

(D)FD35/OW MAXIMUM UL CLASSIFIED SIZES –
Single section vertical and horizontal installation
36"w x 36"h (914 x 914)

(D)FD60/OW MAXIMUM UL CLASSIFIED SIZES –
Single section vertical installation
32"w x 36"h (813 x 914)
Single section horizontal installation
32"w x 36"h (813 x 914)
Multiple section vertical and horizontal installation
36"w x 36"h (914 x 914)

(D)FD35SS/OW MAXIMUM UL CLASSIFIED SIZES –
Single section vertical and horizontal installation
30"w x 36"h (762 x 914)
Multiple section vertical and horizontal installation
36"w x 36"h (914 x 914)

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
• Flanged System Breakaway Connections
• Cavity Shaft Wall Metal Stud Framing
• SP100 Switch Package

SEE COMPLETE MARKING ON PRODUCT
California State Fire Marshal Listing No.
FD35/OW – 3225-0245:0005
FD35SS/OW – 3225-0245:0005
FD60/OW – 3225-0245:0004
1. Opening Clearance
Opening clearance for expansion is not required for the Out of Wall or Floor dampers. However, to accommodate for the sleeve and insulation thickness, the finished opening needs to be 1/2" (13) larger in width and height than the damper nominal size. For example a 24" x 20" (610 x 508) damper the finished opening should be minimum of 24½" x 20½" (622 x 521). The wallboard may be finished to enhance the appearance of the opening.

2. Damper Orientation
Dampers are designed to operate with blades running horizontally. Use “Mount With Arrow Up” label as a guide for proper damper orientation. The maximum the leading edge of the damper frame can be installed outside the wall:
Steel Stud or Masonry Walls: 8" (203)
Wood Stud Walls: 6" (152)

3. Insulation
Insulation shall be 1/4" (6) fiberfrax attached to all four sides of the damper and sleeve assembly (factory installed).

4. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage requirements are listed in the SMACNA Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems and in NFPA 80A. If a breakaway style duct/sleeve connection is not used, the Sleeve shall be a minimum of 16 gage (1.6) for dampers up to 36" (914) wide by 24" (610) high and 14 gage (1.9) for dampers exceeding 36" (914) high 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 firewall or partition on sides equipped with actuator and/or factory installed access door. Sleeve shall terminate at both sides of wall in dimensions shown.

5. Fasteners
a. Fasteners spacing to attach the mounting angles or damper sleeve to the wall or floor and mounting angles to the damper sleeve, minimum of 1 fastener per side.
Steel Stud or Masonry Walls: 12" (305) c-to-c
Wood Stud Walls: 6" (152) c-to-c
b. Fastener to attach mounting angles to the wall or floor.
In masonry walls or floor use minimum #10 self-tapping concrete anchors. Screw must engage the wall or floor a minimum of 11/2" (38).
In metal stud use minimum #10 (M5) screws. Screw must engage the metal stud a minimum of 11/2" (13).
In wood stud use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).
c. Fastener to attach mounting angles to the damper sleeve.
Mounting angles to be connected to the damper sleeve with minimum of number 10 (M5) screws on each side, except for damper to the wall or floor and mounting angles to the damper sleeve. Mounting angles may be used but are not required.

6. Mounting Angles
a. Mounting angles shall be a minimum of 11/2" x 11/2" x 20 gage steel (38 x 38 x 1.0). Ruskin “FAST” angle or only a single conventional mounting angle is required on side opposite of the damper and fastened to the damper sleeve and wall or floor. Do not weld or fasten conventional angles together at the corners of damper.
b. Optional installation where the damper is larger than the opening in the wall, the mounting angle is not required and the damper is to be fastened to the wall from the inside of the damper sleeve. Mounting angles may be used but are not required.
c. Optional installation where the damper is larger than the opening in the floor and the damper is mounted on the top side of the floor, the mounting angle is not required and the damper is to be fastened to the floor from the inside of the damper sleeve. Mounting angles may be used but are not required.
d. Optional installation where the damper is larger than the opening in the floor and the damper is mounted on the bottom side of the floor, 11/2" x 11/2" x 20 gage steel (38 x 38 x 1.0) mounting angle is required on the top side of the floor fastened to the damper sleeve and floor.

7. Duct/Sleeve Connection
a. Break-away Duct/Sleeve Connection
Rectangular ducts must use one or more of the connections depicted below:

b. Round and Oval Break-away Connection
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 Polymers – DP 1010
Precision – PA2084T
Hardcast, Inc. – Iron Grip 601
Eco Duct Seal 44-52

• Duct diameters over 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.

8. Installation and Maintenance
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Dampers must be maintained, cycled, and tested in accordance with local codes and recognized standards or publications like: NFPA 80, 90A, 101, etc.
VERTICAL INSTALLATION

ITEM DESCRIPTION
1. Wall: steel or wood stud or masonry
2. Damper
3. 1/4" (6) thick insulation (Factory Installed)
4. Fasteners – See Note #5
5. Duct/Sleeve connection
6. Mounting Angles – See Note #6
7. Grille (By Others) Optional

OPTIMAL VERTICAL INSTALLATION
**HORIZONTAL INSTALLATION**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Wall: steel or wood stud or masonry</td>
</tr>
<tr>
<td>2.</td>
<td>Damper</td>
</tr>
<tr>
<td>3.</td>
<td>1/4&quot; (6) thick insulation (Factory Installed)</td>
</tr>
<tr>
<td>4.</td>
<td>Fasteners – See Note #5</td>
</tr>
<tr>
<td>5.</td>
<td>Duct/Sleeve connection</td>
</tr>
<tr>
<td>6.</td>
<td>Mounting Angles – See Note #6</td>
</tr>
<tr>
<td>7.</td>
<td>Grille (By Others) Optional</td>
</tr>
</tbody>
</table>

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**OPTIONAL HORIZONTAL INSTALLATION**
FIRE AND COMBINATION FIRE SMOKE DAMPERS FOR GRILLE MOUNTING
UL555 CLASSIFIED
1½ HR. RATING

APPLICATION

IBD2G, IBD2SSG (Static) and DIBD2G, DIBD2SSG (Dynamic) curtain type fire dampers for grille installation may be installed vertically in walls or horizontally in floors with fire resistance ratings of less than 3 hours. Model ‘G’ curtain fire dampers are offset in a sleeve to fit within the wall/floor plane behind the customer’s supplied grille. The damper/sleeve assembly is installed with angle one side (FAST) to allow the use of all types of grilles.

Model ‘G’ dampers require access to both sides of the wall/floor for the proper installation; however access through the grille for inspection or maintenance is permissible.

For application where the damper would be installed outside the plane of the wall or floor refer to model GA (Grille Access) or OW (Out of Wall).

FEATURES

• Dampers are produced in an ISO 9001 certified factory
• FAST Angle factory supplied for labor saving angle one-side installation.

OPTIONS

• FM Approvals as Specification Tested Product.
• SP200 Switch Package to allow remote indication of damper blade position.
• Factory Sleeves of various lengths and gages to ensure field compliance with UL installation requirements.
• Fusible Links 165ºF (74ºC) is standard. 212ºF (100ºC) and 285ºF (141ºC) are optional

Specifications

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Models</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>301 stainless steel When Required</td>
<td>1½</td>
</tr>
</tbody>
</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size**</th>
<th>Maximum Single Section</th>
<th>Maximum Multiple Section**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>DIBD2G</td>
<td>4&quot; x 4&quot;</td>
<td>(102 x 102)</td>
<td>33&quot; x 36&quot;</td>
</tr>
<tr>
<td>DIBD2SSG</td>
<td>6&quot; x 6&quot;</td>
<td>(152 x 152)</td>
<td>36&quot; x 36&quot;</td>
</tr>
<tr>
<td>IBD2G</td>
<td>6&quot; x 6&quot;</td>
<td>(152 x 152)</td>
<td>33&quot; x 38&quot;</td>
</tr>
<tr>
<td>IBD2SSG</td>
<td>6&quot; x 6&quot;</td>
<td>(152 x 152)</td>
<td>33&quot; x 38&quot;</td>
</tr>
<tr>
<td>(D)FD35G</td>
<td>8&quot; x 6&quot;</td>
<td>(203 x 152)</td>
<td>36&quot; x 48&quot;</td>
</tr>
<tr>
<td>(D)FD60G</td>
<td>8&quot; x 6&quot;</td>
<td>(203 x 152)</td>
<td>32&quot; x 48&quot;</td>
</tr>
<tr>
<td>FSD36G</td>
<td>8&quot; x 6&quot;</td>
<td>(203 x 152)</td>
<td>36&quot; x 48&quot;</td>
</tr>
<tr>
<td>FSD60G</td>
<td>8&quot; x 6&quot;</td>
<td>(203 x 152)</td>
<td>32&quot; x 48&quot;</td>
</tr>
</tbody>
</table>

* Dynamic sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)
** See product data sheets for more details on single and multiple section sizing.

Models meets the requirements for combination fire and smoke dampers established by:
• ICC International Building Codes
• New York City (MEA 252-05-E)
APPLICATION

The Model G curtain fire damper is designed to be mounted behind a grille in the wall or floor. Model G dampers are offset in the damper sleeve for appropriate damper placement within the wall or floor. Model G dampers are designed for one side-mounting angle installation. Sleeve and/or mounting angles may be factory or field furnished. Grille may be installed on both sides of the wall or floor if no duct connection is required (Grille by others).

STATIC FIRE DAMPERS

Not for use in Dynamic (fans on) Systems.

MODEL IBD2G and IBD2SSG MAXIMUM SIZE

Single Section
Vertical – 48”w x 30”h (1219 x 762) or 33”w x 48”h or (838 x 1219) or 36”w x 36”h (914 x 914).
Horizontal – 30”w x 45½”h (762 x 1156) or 33”w x 38”h (838 x 965).
Multiple Section Assembly
Vertical – 90”w x 48”h (2286 x 1219) or 48”w x 72”h (1219 x 1829).
Horizontal – 90”w x 48”h (2286 x 1219) or 48”w x 90”h (1219 x 2286).

MODEL IBD20G MAXIMUM SIZE

Single Section
Vertical – 48”w x 30”h (1219 x 762) or 33”w x 48”h or (838 x 1219) or 36”w x 36”h (914 x 914).
Horizontal – 30”w x 45½”h (762 x 1156) or 33”w x 38”h (838 x 965).

MODEL IBDTG, IBTD1G and IBTD2G MAXIMUM SIZE

Single Section
Vertical – 40”w x 48”h (1016 x 1219).
Horizontal – 60”w x 12”h (1524 x 305).

Notes:
1. Dimensions shown in parentheses (   ) indicate millimeters.
2. All multiple section dampers are constructed of equal single section sizes no greater than the maximum single section sizes indicated above.

DYNAMIC FIRE DAMPERS

Use in Dynamic (fans on) or Static (fans off) Systems

MODEL DIBD2G MAXIMUM SIZE

Single Section
Vertical – 33”w x 36”h (838 x 914).
Horizontal – 24”w x 24”h (610 x 610).
Multiple Section Assembly
Vertical – 72”w x 48”h (1828 x 1219) or 48”w x 72”h (1219 x 1829).

MODEL DIBD2X2G MAXIMUM SIZE

Single Section
Horizontal – 18”w x 24”h (457 x 610) or 24”w x 18”h (610 x 457).
Multiple Section
Horizontal – 36”w x 48”h (914 x 1219) or 48”w x 36”h (1219 x 914).

MODEL DIBD2SSG MAXIMUM SIZE

Single Section
Vertical or Horizontal – 24”w x 24”h (610 x 610).

MODEL DIBDX2G MAXIMUM SIZE

Multiple Section
Horizontal – 36”w x 48”h (914 x 1219) or 48”w x 36”h (1219 x 914).

MODEL DIBD20G MAXIMUM SIZE

Single Section
Vertical – 33”w x 36”h (838 x 914).
Horizontal – 24”w x 24”h (610 x 610).

INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instruction 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 Dampers Installation in Concrete Floor with Steel Deck
- Drivemate No. 14880 Breakaway Connection
- Flanged System Breakaway Connections
- Cavity Shaft Wall Metal Stud Framing

California State Fire Marshal Listing No. 3225-245:0005
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/sleeve assembly to permit installation and expansion. The maximum opening size shall not exceed 1/8" (3) (1/4" for stn. stl.) per foot (3 per 305), nor shall be less than 1/4" (6) larger than the damper/sleeve assembly. The opening shall be a maximum of 1" (25) larger than the overall size of the damper/sleeve assembly.

2. Fasteners and Multiple Section Assembly
Use No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds as depicted in figures 1 and 2 and spaced as follows when joining individual dampers to make multiple section damper assemblies or when fastening damper to the sleeve:
Vertical Mount (In wall)
Galvanized steel dampers 12" (305) spacing
Stainless steel dampers 6" (152) spacing
Horizontal Mount (In floor)
All dampers 6" (152) spacing

Multiple section horizontal mount dampers require a 14 gage thick x 4 1/2" (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds staggered intermittently and spaced on maximum 6" (152) centers. The reinforcing plate must be the same material as the dampers. The length must be equal to the damper width of two or more adjoining damper sections. Reinforcing plates are not required for assemblies consisting of two dampers attached end-to-end or three dampers attached side-to-side as depicted in figure 3.

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connection to it. Sleeve gage 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 gage (1.6) for dampers up to 36" (914) high and 14 gage (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 installed access door. Sleeve may extend up to 16" (406) beyond the fire wall or partition on side equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation
Use "Air Flow" and "Mount with Arrow Up" labels on Dynamic DIBD and DIBDX models for proper damper orientation. For Static IBD models use only "Mount With Arrow Up" label on damper for proper damper orientation.

5. Mounting Angles
Mounting angles shall be a minimum of 1 1/2 x 1 1/2 x 20 gage steel (38 x 38 x 1.0). For openings in metal stud, wood stud walls or concrete/masonry walls and floors of sizes 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286) and less. Mounting angles are only required on one side of the wall or top/side of the floor and must be attached to both the sleeve and the wall or floor. Mounting angles need to overlay the wall or Floor by minimum of 1" (25). Mounting angles may be installed directly to the metal studs under the wallboard on metal stud installation only. For larger openings see "Transfer Opening and Duct Terminati"on" installation supplement.

a. Mounting Angle Fasteners
Sleeve: #10 bolts or screws, 3/16" (3) steel rivets or 1/2" (13) long or welds.
Masonry/Wall or Floor: #10 self-tapping concrete screws.
Wood/Steel Stud Wall: #10 screws

b. Mounting Angle Fastener Spacing
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 on each side, top and bottom. Screw fasteners used in metal stud must engage the metal stud a minimum of 1 1/2" (13). Screw fasteners used in wood stud must engage the wood a minimum of 3/4" (19). Screw fasteners used in masonry walls or floors must engage the wall a minimum of 1 1/2" (38).

6. Duct/Sleeve Connections
a. Break-away Duct/Sleeve Connections
Rectangular ducts must use one or more of the connections depicted below:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAIN &quot;S&quot; SLIP</td>
<td>Rectangular ducts must use one or more of the connections below.</td>
</tr>
<tr>
<td>HEATMED &quot;S&quot; SLIP</td>
<td>Rectangular ducts must use one or more of the connections below.</td>
</tr>
<tr>
<td>DOUBLE &quot;S&quot; SLIP</td>
<td>Rectangular ducts must use one or more of the connections below.</td>
</tr>
<tr>
<td>INSIDE SLIP JOINT</td>
<td>Rectangular ducts must use one or more of the connections below.</td>
</tr>
</tbody>
</table>

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 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 19" (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 connections when installed as shown on the "Flanged System 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 System 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 gage (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gage (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
VERTICAL INSTALLATION

STEEL STUD or MASONRY WALLS
Mounting angle may be located on top or underneath the wallboard (See note 5).

WOOD STUD
Mounting angle to be mounted on top of wallboard (See note 5).

HORIZONTAL INSTALLATION

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
FASTENER SPACING

HORIZONTAL INSTALLATION

6" (152) Max.c-c

3" (76) Max.

See Note 2

Mullion Plate See Note 2

VERTICAL INSTALLATION

6" (152) or 12" (305) Max.c-c

2" (51) Max.

See Note 2

FIGURE 1

FIGURE 2

REINFORCING PLATE

No Mullion Plate Req'd

Mullion Required on 2 or more adjoining sections See Note 2

No Mullion Plate Req'd

FIGURE 3
INSTALLATION INSTRUCTION SUPPLEMENTS

FRAMING
RECOMMENDED FRAMING FOR OPENINGS IN WOOD AND METAL STUD WALLS
CAVITY SHAFT WALL METAL STUD FRAMING
METAL STUD FRAMING FOR COMBINATION FIRE AND SMOKE DAMPERS IN TUNNEL CORRIDOR SHAFT-WALL CEILINGS
SUPPORT MULLIONS FOR DAMPERS IN OVERSIZED WALL OPENINGS

Duct Connections
FLANGED SYSTEM BREAKAWAY CONNECTIONS
TDF AND TDC FIELD ADD-ON CONNECTIONS

Extend and Trim Damper Sleeve
EXTENSION OF FIRE AND COMBINATION FIRE AND SMOKE DAMPER SLEEVES
TRIMMING OF FIRE AND COMBINATION FIRE SMOKE DAMPER SLEEVES

Sealants and Fire Stop Material
OPTIONAL FIRESTOP MATERIAL
OPTIONAL SEALANT OF DAMPERS IN FIRE RATED WALL OR FLOOR OPENINGS

Grille and Transfer Openings
TRANSFER OPENINGS AND GRILLE DUCT TERMINATIONS
11/2 HOUR UL CLASSIFIED DAMPERS WITH GRILLE MOUNTING ANGLES
FIRE AND COMBINATION FIRE AND SMOKE DAMPER INSTALLATION IN CONCRETE FLOOR WITH STEEL DECK
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.
APPLICATION

These installations are for all fire and combination fire and smoke damper installations in cavity shaft wall partitions and apply to the following wall design numbers as detailed in the UL fire Resistance directory: U415, U437, U438, U467, U469 and U497.

GENERAL INSTALLATION NOTES

1. Refer to the installation instructions for the specific damper model for installation details.
2. Gypsum panels must be screwed 12" (305) O.C. maximum to all stud and runner flanges surrounding opening (see framing details).
3. See the appropriate damper installation for the Opening Size, Fasteners, Fastener Spacing and Mounting Angles.

FRAMING DETAILS

Note: Shaft wall construction may utilize C, E, H, I, J, C-H or C-T stud wall construction.
NOTES
1. Gypsum panels must be attached, 12" (305) O.C. maximum, to all stud and runner flanges surrounding opening with 1 5/8" (41) drywall screws.

2. Mounting angles shall be Ruskin PFMA or a minimum of 1 1/2" x 1 1/2" x 20 ga. (38 x 38 x .9) conventional mounting angle. The angles should be attached to the sleeve, not the partition, with No. 10 (M5) bolts or screws, 3/16" (5) minimum diameter steel rivets or 1/2" (13) long tack welds. A minimum of two connections per side, top and bottom. Mounting angles shall overlap the wall a minimum of 1" (25).

3. See standard installation instructions sheet for additional details.
Fire dampers are UL classified for their maximum size or maximum assembly size. Steel support mullions can be used to separate openings in concrete block or poured concrete walls that are larger than the maximum UL damper assembly size. The opening must not exceed a maximum 120" (3048) high, but can be any width provided a vertical support mullion is used a maximum of every 120" (3048). The walls must be a minimum 7" (178) to a maximum 12" (305) thick. Hollow concrete block walls must be suitably filled with 3500 minimum psi concrete for proper securing of mullions. The fire resistance rating of the barrier must be less than 3 hours. Steel support mullions are not intended to be part of the ductwork or in the airstream.

Refer to the appropriate Ruskin product specification sheet for UL damper size limitations. When the duct size exceeds the maximum damper width or height, the opening must be divided into two or more separate openings with a support mullion installed between damper sections. The mullion consists of a vertical and or horizontal mullion and mullion caps (one cap for each mullion end).

**Important Note:** Underwriters Laboratories does not recognize steel support mullions for use with dynamic fire dampers.
GENERAL INSTALLATION

Fabricate mullion of 16 gage (1.6) galvanized steel as shown in Figure 1. Two mullion pieces are joined with 3/16" (5) diameter steel pop rivets or 3/4" (19) long welds located 6" (152) maximum from each end and 12" (305) on center maximum. The mullion should permit clearance between the mullion and top cap. Required clearance is 1/8" (3) per foot or wall opening height. Maximum permitted clearance is 1 1/4" (31) (for example, permitted clearance for an 8" (203) high opening is 1/8" (3) x 8" = 1" (25) +).

Fabricate two caps per each mullion of 12 gage (2.8) galvanized steel as shown in Figure 2 for vertical mullions and horizontal mullions. Caps must permit mullion to overlap each cap by 3" (76) minimum. Cap height is calculated by adding 3" (76) to permitted mullion expansion clearance which is 1/8" (3) per foot of wall opening height.

Insert mullion caps into mullion ends allowing mullion to float between the caps. DO NOT fasten mullion to caps in any way. Locate within opening to provide correct expansion clearance for dampers.

Drill holes in caps and concrete for anchoring steel mullion caps with 1/4" (6) - 20 x 5/16" (8) steel screws and 3/8" (10) diameter x 1" (25) concrete expansion anchors as shown in Figure 2. Set horizontal mullion caps at vertical mullions as shown in Figure 3 as required. If steel lintels are present, four 1" (25) welds (two per mullion cap leg) may be used to anchor each mullion cap.

NOTE: Dimensions shown in parentheses ( ) indicate millimeters.
FLANGED SYSTEM BREAKAWAY CONNECTIONS
INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATION

Flange breakaway connection for fire damper or combination fire smoke damper. These instructions apply to a connection between a manufactured flange system by Ward, Ductmate, Nexus, TDC and TDF. These connections allow the use of combining mixed flange types or like for like. The following instruction depicts the use of Metal or Plastic Cleats, Butyl or Neoprene Gasket, and Bolted or Non-Bolted corners. Also the flanges may be connected with the use of #10 screws without the cleats.

1. Install the manufactured flange system onto the damper sleeve or duct per the manufacturers instructions.

2. Seal the two flange systems together Neoprene or Butyl gasket may be applied to the mating surfaces.

3. Align the two flange systems together. A 3/8 in. (9mm) bolt may be used in the corners to help with the alignment. The bolt does not have to be removed. Bolted corners are permitted.

4. Install the cleat or # 10 tek screw, approximately equally spaced, per the schedule described:

- Width or height less than 24 in. (610mm); use one cleat or screw per side
- Width or height 24 in. (610 mm) to less than 36 in. (914mm); use 2 cleats or screws per side
- Width or height 36 in. (914mm) to less than 54 in. (1372mm); use 3 cleats or screws per side
- Width or height 54 in. (1372mm) to less than 72 in. (1829mm); use 4 cleats or screws per side
- Width or height 72 in. (1829mm) or greater; use 5 cleats or screws per side.

CLASSIFIED
SEE COMPLETE MARKING ON PRODUCT

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TDF and TDC flanged connections are designed to be roll-formed into the end of the duct or damper sleeve at the time of damper manufacture. If that is not possible, TDF and TDC can be added in the field in accordance with the installation diagram and notes shown below.

**IMPORTANT NOTE:** The add-on piece of TDF or TDC must be “sealed” to the existing sleeve with one of the following approved break-away sealants:

- Hardcast, Inc. - Iron Grip 601
- Ecp Duct Seal 44-52
- Precision - PA2084T
- Design Polymeric - DP 1010

SEE COMPLETE MARKING ON PRODUCT

**NOTE:** Dimensions in ( ) indicate millimeters.
EXTENSION OF FIRE AND COMBINATION FIRE AND SMOKE DAMPER SLEEVES
INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATION

Factory installed sleeves may need to be extended in the field. This supplemental installation instruction provides details for field extension of the factory sleeve. Figure 1 depicts a factory installed sleeve long enough to extend through the fire rated barrier. Figure 2 depicts a factory installed sleeve that is not long enough to extend through the fire rated barrier.

GENERAL INSTALLATION

Sleeve extension must be of the same material and gage as the factory sleeve. Overlap the factory sleeve a minimum of 1" (25). Attach the sleeve extension using No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds spaced 6" (152) on center. The joint between the two sleeves must then be sealed with a continuous 1/8" (3) bead of Dow-Corning 999-A, Dow Corning Silastic 732 RTV or GE RTV 108 sealant. The extended factory sleeve must not extend more than 16" (406) beyond the wall on the actuator side and not more than 6" (152) on the non-actuator side.

SEE COMPLETE MARKING ON PRODUCT
Factory supplied sleeves may need to be trimmed in the field to accommodate field conditions. Other damper components such as actuators and fuse links should not be altered.

Sleeve Dimensions

1. The damper sleeve should not extend more than 6" (152) beyond the rated barrier on the non-actuator or access door side.
2. The damper sleeve should not extend more than 16" (406) beyond the rated barrier on the actuator or access door side.
APPLICATION

Application of firestopping caulk in the annular space surrounding a 1 1/2 or 3 hour curtain type or multi-blade fire and combination fire and smoke dampers is not required. However, if the Authority Having Jurisdiction or the installation warrants firestopping in place of a "standard" retaining angle installation, these instructions apply.

1. Wall or Floor Assembly –
   Concrete wall or floor – must be a minimum 2 1/2" thick normal weight (100 - 150 pcf) or minimum 4 1/2" thick lightweight concrete. The wall may be constructed of any UL Classified Concrete Block.
   Gypsum wallboard/stud wall – must be constructed of the materials and in the manner specified in the U400 Series Wall and Partition Designs in the UL Fire Resistance Directory. Studs shall be minimum 3 1/2" (89) steel channel spaced a maximum 24" (610) on center. Opening must be completely framed.

2. Damper – Ruskin fire or fire/leakage rated damper in minimum 20 gage (.010) sleeve. Damper size shall not exceed 90" x 48" (2286 x 1219) or 48" x 90" (1219 x 2286).

3. Expansion Clearance – The opening in the wall or floor must be a minimum of 1/8" per foot (3 per 305) larger than the overall damper/sleeve assembly. The maximum opening size is 1" (25) larger than the minimum clearance with a 1 1/2" (38) maximum space between the damper sleeve and wall or floor.

4. Packing (Optional) – Polyethylene backer rod, recessed from both surfaces of wall or floor to accommodate the required thickness of fill material.

5. Fill Material – Fire stop caulk applied to a minimum 5/8" (16) thickness for 1 1/2 hour dampers or 1" (25) for 3 hour dampers within the annular space and flush with both surfaces of the wall or bottom surface of floor. If the damper/sleeve assembly comes into contact with the wall or floor, a minimum 3/8" (10) diameter bead shall be applied to the interface between the sleeve and contact surface.

6. Retaining Clip – (Walls Only), 1" x 2" x 2" x 16 gage (25 x 51 x 51 x 1.6) angle attached to one side of the wall with 1 1/2" (38) long #8 wallboard screws or #8 masonry screws in masonry walls. The 1" (25) leg of the angle shall be attached to the damper sleeve with 1/2" (13) long #10 sheet metal screws. The angles are required to be spaced a maximum of 6" (152) from the top of sleeve and spaced a maximum of 12" (305) on center on the sides of the unit only.

7. Retaining Angle – Retaining angles are required on side of wall opposite retaining clips for 3 hour vertical dampers larger than 24" x 24" and on top side of floor for all horizontal fire dampers. Ruskin PFMA as shown in the supplemental installation instructions or minimum 1 1/2 x 1 1/2 x 16 gage (38 x 38 x 1.6) galvanized retaining angles may be substituted for the caulking on the side of wall opposite the retaining clips. The angle must overlap the wall or floor a minimum of 1" (25) and shall be attached to the sleeve of the fire damper with #10 bolts or screws, 1/2" (13) long tack welds or 3/16" (5) diameter steel rivets with a minimum of two connections on each side, top and bottom of the damper. Space fasteners 8" (203) on center. Do not weld or fasten angles together at corners of damper.

SEE COMPLETE MARKING ON PRODUCT
APPLICATION

Application of sealant between the mounting angles or retaining plates and the fire rated wall or floor is not required by Underwriters Laboratories. However, if a tight seal on these areas is specified, sealant shall be applied as shown here.

Note: If opening size allows for angle on one side only then sealant shall be applied on only angle side. Nothing is required on non-angle side.

GENERAL INSTALLATION

Follow the sealant manufacturer's directions, remove dirt, grease, and moisture from the surface to be sealed. Apply a continuous bead of sealant to the location applicable to your specific installation. (See figures 1 through 4.)

Approved sealant or fire stop materials:
- Dow Corning - Silastic 732RTV
- GE - RTV 108
- Hilti Corporation - FS-One, CP606
- 3M - #M-CP 25WB+
- Specified Technologies, Inc. - SpecSeal® Series SSS or LCI
- John Manville International, Inc. - Firetemp™ CI
- Rectorseal - Metacaulk 1000, Metacaulk 350i, Biostop 500+ or Biostop 350i

Do not apply sealant within the required expansion gap between the damper and the fire rated wall or floor.

Press the surface of the sealant in place to dispel any air. Allow sealant to set up and become tack-free before operating the damper. Refer to the appropriate damper installation instructions for details on damper installation.

For installation with firestop material applied into the expansion gap see "Optional Firestop Material" installation instructions supplement.

ITEM DESCRIPTION

1. Fire Rated Wall or Floor
2. Damper
3. FAST/PFMA/conventional mounting angles
4. Sleeve
5. Retaining Plate
6. Sealant (see general installation for specific sealant)
TRANSFER OPENINGS AND GRILLE DUCT TERMINATIONS
INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATIONS

Ruskin fire and combination fire and smoke dampers with 1 1/2 and 3 hour fire ratings may be installed in transfer opening and grille duct termination applications. **Grille installation in these applications is optional.**

Select the damper with sleeve of sufficient length to fit flush with wall or floor where appropriate and to permit attachment of perimeter mounting angles and ductwork where required. Ruskin fire and combination fire and smoke dampers require mounting angles on only one side of the wall or floor. Refer to the appropriate installation instructions for specific information.

GENERAL INSTALLATION

1. Install dampers within opening as defined in the appropriate damper installation instructions sheet. Sleeve shall be flush with wall or floor on one side of the damper for duct termination applications and on both sides for transfer opening applications.

2. Place mounting angles around damper as shown in the appropriate detail above on in accordance with the specific damper installation instruction. Mounting angles shall overlap wall or floor a minimum of 1" (25). Mounting angles installed on flush side of walls shall be notched in order to meet 1" (25) wall overlap requirement at damper corners.

3. Fasten angles to damper with type and quantity of fasteners as specified and detailed in the appropriate installation instructions for the damper model. The inverted mounting angle on the grille side (refer to application figures above) can be eliminated or the angle on the wall side opposite the grille can be eliminated (refer to note #4). When a single angle is used, the angle must be fastened to the damper sleeve and wall or top of the floor in accordance with the installation instructions for the damper.

Dimensions shown in parentheses ( ) indicate millimeters.

NOTES:

1. **For installation information not covered in this sheet, reference appropriate damper basic installation instructions.**

2. Grilles are optional and supplied by others.

3. Vertical installation is shown; horizontal installation is similar.

4. 1 1/2 hour fire rated dampers that are 90"w x 48"h (2286 x 1219) or 48"w x 90"h (1219 x 2286) and smaller may be installed with angles on only one side of the barrier (either side of the wall or top of the floor).
INSTALLATION INSTRUCTIONS SUPPLEMENT
1 1/2 HOUR UL CLASSIFIED DAMPERS WITH GRILLE MOUNTING ANGLES
FOR RUSKIN (D)IBD, FD AND FSD DAMPERS

APPLICATION
Style G fire and combination fire and smoke damper includes grille mounting angles for flush installation of a minimum 26 gage (.021) steel frame grille with the wall or floor. No additional mounting angles are required on the grille side of the wall or floor. The damper is offset in the damper sleeve for appropriate damper placement within the wall or floor.

CURTAIN FIRE DAMPERS
STATIC FIRE DAMPERS
Not for use in dynamic (fans on) systems.

MINIMUM SIZE
Vertical Installation – 4"w x 4"h (102 x 102).
Horizontal Installation – 6"w x 6"h (152 x 152).

MAXIMUM SIZE
Single section
Vertical Installation
  IBD2 - 48"w x 30"h (1219 x 762) or 30"w x 48"h (762 x 1219).
  IBD20 - 48"w x 30"h (1219 x 762) or 30"w x 48"h (762 x 1219).
  IBDT - 40"w x 32"h (1016 x 813) or 32"w x 48"h (813 x 1219).
Horizontal Installation
  IBD2 - 24"w x 18"h (610 x 457) or 18"w x 24"h (457 x 610).
  IBD20 - 24"w x 18"h (610 x 457) or 18"w x 24"h (457 x 610).
  IBDT - 24"w x 12"h (610 x 305).

Note: Dimensions shown in parentheses ( ) indicate millimeters.

DYNAMIC FIRE DAMPERS
See label on damper for maximum air flow and pressure.

MINIMUM SIZE
Vertical Installation – 4"w x 4"h (102 x 102).
Horizontal Installation – 6"w x 6"h (152 x 152).

MAXIMUM SIZE
Single section
  IBD2 - 48"w x 36"h (1219 x 914)
  IBD20 - 48"w x 36"h (1219 x 914)
  IBDT - 40"w x 32"h (1016 x 813) or 32"w x 48"h (813 x 1219).

COMBINATION FIRE/SMOKE DAMPERS
AND MULTIPLE BLADE FIRE DAMPERS

MINIMUM SIZE
  FSD35 – 5"w x 6"h (127 x 152).
  FSD36, 37, 60, 60-2, FD35, FD60 – 8"w x 6"h (203 x 152).

MAXIMUM SIZE
  FSD60, 60-2, FD60 - 32"w x 48"h (813 x 1219)
  FSD35, 36, 37, FD35 – 32"w x 48"h (813 x 1219) or 48"w x 32"h (1219 x 813).

INSTALLATION SUPPLEMENTS
Refer to the appropriate Ruskin installation operation instructions supplements for special requirements:
  • Drivemate No. 14880 Breakaway Connection
  • Flanged System Breakaway Connection
  • Optional Sealant of Dampers in Fire Rated Wall or Floor Openings
  • Cavity Shaft Wall Metal Stud Framing
  • Extension of Fire and Combination Fire and Smoke Damper Sleeves.
1. Opening Clearance
The opening in the wall or floor shall be larger than the damper/ sleeve assembly to permit installation or expansion. The maximum opening size shall not exceed 1/8” (3) (1/4” for stn. std.) per foot (3 per 305), nor shall be less than 1/4” (6) larger than the damper/sleeve assembly. The opening shall be a minimum of 1” (25) larger than the overall size of the damper/sleeve assembly.

2. Fasteners
Use No. 10 (M5) bolts or screws, 3/16” (5) rivets, tack welds or spot welds and spaced as follows when fastening damper to the sleeve:
- Vertical Mount (In wall)
  - Galvanized steel dampers: 12” (305) spacing
  - Stainless steel dampers: 6” (152) spacing
- Horizontal Mount (In floor)
  - All dampers: 6” (152) spacing

3. Damper Sleeve
Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gage 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 gage (1.6) for dampers up to 36” (914) wide by 24” (610) high and 14 gage (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 a factory installed access door. Sleeve may extend up to 16” (406) beyond the fire wall or partition on sides equipped with a factory installed access door. Sleeve shall terminate at both sides of wall within dimensions shown.

4. Damper Orientation
Dampers must be installed with the blades within the wall or floor when they are in the closed position. Use "Mount With Arrow Up" labels for proper damper orientation.

5. Steel Grille
The steel grille (furnished by others) must include a minimum 26 gage frame thickness. The grille must be fastened to angles provided with damper using #10 screws. Do not fasten grille directly to wall or floor. Grille shall overlap wall a minimum of 1/2” (13).

6. Grille Mounting Angles
If grille mounting angles are furnished and installed in the field, they must be 3/4” x 3/4” x 3” long 20 gage (19 x 19 x 76 x 1.0) galvanized steel. They must be attached to the damper sleeve with a minimum of two 3/4” (4.8) steel rivets per angle. The angles must be spaced as follows:
- Damper maximum size 18” x 24” or 24” x 18” (457 x 610 or 610 x 457), angles must be located on each vertical side of damper and centered at damper’s height. Damper maximum size 32” x 48” or 48” x 32” (813 x 1219 or 1219 x 813), angles must be located on maximum 12” (305) spacing on vertical sides and 18” (457) on top and bottom.

7. Mounting Angles
Mounting angles shall be a minimum of 11/2” x 11/2” x 20 gage steel (38 x 38 x 1.0) 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 dampers may be installed using the Ruskin FAST angle.

   a. Mounting Angle Fasteners
   Mounting angle fasteners shall be #10 (M5) bolts or screws, #10 self-tapping concrete anchors or concrete screws, 1/4” (13) long tack welds or 3/8” (3) diameter steel rivets.

   b. Mounting Angle Fastener Spacing
   Fasteners shall be spaced at 6” (152) o.c.

8. Duct/Sleeve Connections
   a. Break-away Duct/Sleeve Connections
   Rectangular ducts must use one or more of the connections depicted: below:

   ![Connection Diagrams]

   A maximum of two #10 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 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.

   Note: When optional sealing of these joints is desired, the following sealants may be applied in accordance with the sealant manufacturer's instructions:
   - Hardcast, Inc. – Iron Grip 601
   - Precision – PA20847
   - Eco-Duct Seal 44-52
   - Design Polymers – DP 1010

   c. Flanged Break-away Style Duct Sleeve Connections
   Flanged connection systems manufactured by Ductmate, Nexus or Ward are approved break-away connections when installed as shown on the Flanged System 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 System 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 gage (1.6) for dampers up to 36” (914) wide x 24” (610) high and 14 gage (2.0) for dampers exceeding 36” (914) wide x 24” (610) high.

9. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.
CURTAIN TYPE FIRE DAMPER
VERTICAL INSTALLATION

See Note 7

1\" (25) Min. Overlap

1/4\" (6) Min. Clearance

1/2\" (13) Min. Overlap

Grille must be minimum 26 ga. steel.

See Note 7

1\" (25) Min. Overlap

1/4\" (6) Min. Clearance

1/2\" (13) Min. Overlap

Grille must be minimum 26 ga. steel.

COMBINATION FIRE AND SMOKE DAMPER
VERTICAL INSTALLATION

GRILLE DETAIL
Grille must be minimum 26 ga. steel.
CURTAIN TYPE FIRE DAMPER HORIZONTAL INSTALLATION

Grille

$\frac{1}{2}$" (13) Min. Overlap

6" or 16" (152 or 406) Max.

$\frac{1}{4}$" (6) Min. Clearance

See Note 7

COMBINATION FIRE AND SMOKE DAMPER HORIZONTAL INSTALLATION

Grille

$\frac{1}{2}$" (13) Min. Overlap

6" or 16" (152 or 406) Max.

$\frac{1}{4}$" (6) Min. Clearance

See Note 7

CURTAIN TYPE FIRE DAMPER HORIZONTAL INSTALLATION

$\frac{1}{4}$" (6) Min. Clearance

* (25) Min. Overlap

See Note 7

COMBINATION FIRE AND SMOKE DAMPER HORIZONTAL INSTALLATION

$\frac{1}{4}$" (6) Min. Clearance

1" (25) Min. Overlap

6" or 16" (152 or 406) Max.

$\frac{1}{4}$" (13) Min. Overlap

Grille
FIRE AND COMBINATION FIRE AND SMOKE DAMPER
INSTALLATION IN CONCRETE FLOOR WITH STEEL DECK
INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATION
Horizontal installation of fire and combination fire and smoke dampers in concrete floors utilizing a steel deck may not allow the bottom angle to be placed against the steel deck on an even plane. This installation details how to properly install the required angles next to the steel deck.

NOTES
1. Retaining angles are required on top and bottom sides of the damper as detailed in the damper installation instructions. Angles may be reversed so that one leg of the angle points into the floor opening.
2. Installation of the bottom angle against the uneven steel deck shall be done so the angles on each side of the sleeve are as close to the barrier as possible. The angles may be in different planes relative to each other (see figures 1 and 2).
3. When viewed from the end of the sleeve, the angles must overlap each other in the corners to prevent “see through.”

SEE COMPLETE MARKING ON PRODUCT

Click to Return to: INDEX FSD SD IBD/DFD CFD
SMACNA
INSTALLATION
INSTRUCTION
RECOMMENDATIONS

The following installations are from the SMACNA’s “Fire, Smoke and Radiation Damper Installation Guide for HVAC System” Fifth Edition

Minimum Sleeve Thickness
Out of Wall Fire Damper Installation
Out of Wall Fire Smoke Damper Installation
Duct Liner Interruption
Duct Insulation
Multiple Penetrations
Diagonal Penetration

SHEET METAL AND AIR CONDITIONING CONTRACTORS’ NATIONAL ASSOCIATION, INC.
<table>
<thead>
<tr>
<th>Type of Connection</th>
<th>Duct</th>
<th>Duct Dimension</th>
<th>Sleeve Gage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigid</td>
<td>Round – Rectangular</td>
<td>24 in. (610 mm) maximum diameter</td>
<td>16+ (1.613+ mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 in. (610 mm) maximum height and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>36 in. (915 mm) maximum width</td>
<td></td>
</tr>
<tr>
<td>Rigid</td>
<td>Round – Rectangular</td>
<td>over 24 in. (610 mm) diameter</td>
<td>14+ (1.994+ mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>over 24 in. (610 mm) height and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>over 36 in. (915 mm) width</td>
<td></td>
</tr>
<tr>
<td>Breakaway</td>
<td>Round or Rectangular</td>
<td>12 in. (305 mm) and down</td>
<td>26 (0.55 mm)</td>
</tr>
<tr>
<td>(See Figure 5-2</td>
<td></td>
<td>13 – 30 in. (330 – 760 mm)</td>
<td>24 (0.70 mm)</td>
</tr>
<tr>
<td>on pages 5.5 and 5.6)</td>
<td></td>
<td>31 – 54 in. (785 – 1370 mm)</td>
<td>22 (0.85 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>55 – 84 in. (1400 – 2130 mm)</td>
<td>20 (1.0 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>85 in. (2160 mm) and up</td>
<td>18 (1.3 mm)</td>
</tr>
</tbody>
</table>

By UL 555, all ducts are required to terminate at the fire damper sleeves or the damper frames. Sleeve thickness is contingent on the type of connection. All UL listed dampers also have maximum dimensions associated with the test rating. Contingent on sleeve thickness a rigid connection may be used in lieu of a breakaway connection. Sleeves may be omitted where dampers are designed to be in non-ducted air passages or where damper housing permits attachment of retaining angles to the housing. Attachment of retaining angles must not restrict operation of the fire damper. Certain UL approved designs do not require retaining angles.

Where the fire damper sleeve is exposed to the airstream, the metal sleeve will be of the same material as the duct system. A steel sleeve, of the type or finish specified by the system designer, will be used for fibrous glass ductwork and where the fire damper sleeve is not exposed to the airstream.

**Table 5–2 Recommended Minimum Sleeve Thickness for Fire Dampers**

**NOTES:**

* Breakaway connection not required.

* See Figure 5-2, pages 5.5 and 5.6, for details and exceptions.
CAUTION: USE THIS ARRANGEMENT ONLY WHEN PHYSICAL OBSTRUCTIONS PRECLUDE USE OF METHODS SUCH AS THOSE IN FIGURE 5-4. THE USE OF THIS METHOD REQUIRES THE APPROVAL OF THE LOCAL AUTHORITY.

FIGURE 5-5 FIRE DAMPER OUT OF WALL
NOTE: SEVERAL DAMPER MANUFACTURERS HAVE AVAILABLE UL TESTED AND LISTED FIRE/COMBINATION FIRE-SMOKE DAMPERS FOR MOUNTING OUT OF THE FIRE BARRIER. CONTACT DAMPER MANUFACTURERS FOR INFORMATION.

FIGURE 5-6 COMBINATION FIRE/SMOKE DAMPER OUT OF WALL INSTALLATION
5.12 Fire Damper Guide

FIGURE 5-8 DUCT LINER INTERRUPTION

NOTES:

1. INTERRUPTION OF DUCT LINER AT THE FIRE DAMPER IS REQUIRED BY NFPA STANDARD 90A. WHERE 90A IS APPLICABLE, INSTALLATION SHOULD BE MADE AS SHOWN AND SHOULD OTHERWISE CONFORM TO THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS–METAL AND FLEXIBLE.

2. THE DESIGNER SHOULD SPECIFY EXTERNAL INSULATION AS SHOWN TO PREVENT CONDENSATION OCCURRING ON UNLINED METAL AT PENETRATIONS. WHERE THE PROVISIONS OF NFPA 90A ARE APPLICABLE, NEITHER INSULATION NOR LINER CAN EXTEND THROUGH THE WALLS OR FLOORS.

*S SLIP IS ILLUSTRATED; SEE FIGURE 5-2 FOR RANGE OF APPROVED TYPES OF CONNECTIONS.
FIRE DAMPER INSTALLATION
Sheet metal sleeve must be installed through rated fire wall.
Check local codes for proper sheet metal gage and attachment angle.

NOTE: SEALING OF FIBROUS GLASS DUCT BOARD TO SHEET METAL SLEEVE MUST BE MADE WITH GLASS FABRIC AND MASTIC, EXCEPT WHERE OPERATING PRESSURE IS LESS THAN 1" WG. AND SHEET METAL SURFACES ARE CAREFULLY CLEANED, IN WHICH CASE PRESSURE SENSITIVE ALUMINUM FOIL TAPE MAY BE USED.

Sheet Metal Sleeve Through Fire Wall as Specified in Fire Damper MFR’s Instructions

#10 Sheet Metal Screws and 2-1/2" (63 mm) Square Washers, 12" (Max.) O.C. to Attach Duct Board to Sheet

FIGURE 5-9 FIBROUS GLASS DUCT INSTALLATION
**FIGURE 6-3 MULTIPLE PENETRATIONS**

**Fire Resistant Barrier with Multiple Openings**

**NOTE 1:** Structural openings shall be sized to permit expansion of the damper assemblies.

**NOTE 2:** Separate ducts can go to each opening or they can be unducted openings.
NOTE: REQUIRED WALL EXTENSIONS / MODIFICATIONS ARE NOT THE RESPONSIBILITY OF THE DUCTWORK CONTRACTOR.

FIGURE 6-4 DIAGONAL PENETRATION (FIRE DAMPERS)
FUSE LINKS and SWITCH PACKAGES

Electronic Resettable Fuse Link "EFL"
Electronic Resettable Fuse Link with Damper Test Switch “DTS”
EFL/SP100 Electric Resettable Fuse Link and SP100 Switch Package “EFL/SP100”
Damper Test Switch for Smoke Dampers
TS150 FireStat for "Reopenable" Fire and Smoke Dampers
SP100 Switch Package Field Installation Instructions
SP200 Switch Package for Curtain Fire Damper
Pneumatic Fuse Link “PFL”
Fuse Link Replacements
APPLICATION
The EFL Electric Resettable "Fuse" Link is a UL Classified heat responsive device is used in conjunction with Ruskin fire/smoke dampers. The EFL is standard on all fire/smoke dampers ordered with electric actuators. Fire/smoke dampers ordered with pneumatic actuators may be ordered with the EFL and an EP (electro/pneumatic) switch. The EFL closes and locks the damper when temperatures exceed 165°F (74°C) or 212°F (100°C) or 250°F (121°C) or 350°F (177°C) depending on model ordered and installed. The EFL must be factory installed and cannot be added in the field. Replacement EFL's may be field installed with the approval of the local authority.

OPERATION
Fire Conditions – When temperatures in excess of 165°F (74°C), 212°F (100°C), 250°F (121°C) or 350°F (177°C) are detected, the damper will close and lock. Upon cessation of fire conditions the damper can be reopened by pressing the reset button located on the damper assembly.

Smoke Conditions – When smoke signal is detected, the damper will close and remain closed until the smoke signal ceases (or the smoke detector is reset). The system will then reset and the damper will open.
• The damper may be closed at any time by placing a control switch (optional) in the CLOSED position.
• If the EFL is tripped accidentally or during system testing, the EFL must be reset by pressing the RESET button located on the damper assembly.
• Refer to the appropriate damper installation instructions for details on damper installation.

Pneumatic actuators to be piped per local codes.
Electric actuators to be wired per the National Electric Code (NEC) and local codes. See actuator for wiring diagrams.

ITEM  DESCRIPTION
1. EFL165, EFL212, EFL250 or EFL350 Electric Reset Link
2. Flex Conduit
3. Junction Box
4. Actuator or EP Switch
5. Over-Center Lock
6. Damper Sleeve
7. FAST, PFMA or conventional mounting angles
8. Sleeve to Duct Connection (by others)

Refer to wiring diagrams on page 2 for modulating actuators.

ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION. © Ruskin 2014
The Damper Test Switch (DTS) is an optional "momentary" push button test switch available on Ruskin fire/smoke dampers. The DTS gives maintenance personnel the ability to "cycle test" the fire/smoke damper by pushing and holding the button until the damper has cycled. When ordered, as an option, the DTS will be combined with the EFL, in a common enclosure, as shown below. If the fire/smoke damper is ordered with an SP100 switch package, the DTS will be combined with the EFL and SP100 in a common enclosure as shown below.

WIRING DIAGRAMS

NOTE: Dimensions shown in parentheses ( ) indicate millimeters.

SEE COMPLETE MARKING ON PRODUCT
APPLICATION

The EFL/SP100 is a UL Classified heat responsive device and position indicator switches (combined as a single unit) used in conjunction with Ruskin fire/smoke dampers. The EFL is standard on all fire/smoke dampers ordered with electric actuators. The EFL/SP100 will be provided when an electric actuator and separate SP100 position indicator switches are ordered. The EFL closes and locks the damper when temperatures exceed 165°F (74°C) or 212°F (100°C) or 250°F (121°C) or 350°F (177°C) depending on model ordered and installed. The EFL/SP100 must be factory installed and cannot be added in the field. Replacement EFL/SP100’s may be field installed with the approval of the local authority.

OPERATION

Fire Conditions – When temperatures in excess of 165°F (74°C), 212°F (100°C), 250°F (121°C) or 350°F (177°C) are detected, the damper will close and lock. Upon cessation of fire conditions the damper can be reopened by pressing the reset button located on the EFL/SP100 assembly. The SP100 will allow for indication of damper position during fire conditions.

Smoke Conditions – When smoke is detected (detector optional) the damper will close and lock until the smoke signal ceases (or smoke detector resets). The system will then reset and the damper will open. The SP100 will allow for indication of damper position during smoke conditions.

- The damper may be closed at any time by placing the control switch (optional) in the CLOSED position.
- If the EFL/SP100 is tripped accidentally or during system testing, the EFL/SP100 must be reset by pressing the RESET button located on the EFL/SP100 assembly.
- Refer to the appropriate damper installation instructions for details on damper installation.

Pneumatic actuators to be piped per local codes.
Electric actuators to be wired per the National Electric Code (NEC) and local codes. See actuator for wiring diagrams.

S1 and S2 Switch AMP Ratings: 15 AMPS, 24, 125 or 250 VAC 1/2 AMP, 125 VDC, 1/4 AMP, 250 VDC

DESCRIPTION

M – Electric Actuator or EP Switch
TSI – Temp. Sensor
S1 – Position Indicator Switch (Closed)
S2 – Position Indicator Switch (Open)
**APPLICATION**

The Damper Test Switch for Smoke Dampers (DTS-SD) is an optional "momentary" push button test switch available on Ruskin smoke dampers. The DTS-SD gives maintenance personnel the ability to "cycle test" the smoke damper by pushing and holding the button until the damper cycles to its de-energized position. The DTS-SD may be supplied factory mounted and wired to the dampers actuators or shipped loose for field wiring.

**WIRING DIAGRAM**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Smoke Damper</td>
</tr>
<tr>
<td>2.</td>
<td>Side Plate or Sleeve</td>
</tr>
<tr>
<td>3.</td>
<td>Actuator</td>
</tr>
<tr>
<td>4.</td>
<td>Conduit</td>
</tr>
<tr>
<td>5.</td>
<td>DTS-SD</td>
</tr>
</tbody>
</table>

Pneumatic actuators to be piped per local codes.
Electric actuators to be wired per the National Electric Code (NEC) and local codes. See actuator for wiring diagrams.
**APPLICATION**

The TS150 is a UL Classified heat responsive device which is used in conjunction with Ruskin fire/smoke dampers. The TS150 is an optional device which can be ordered with electric actuators or pneumatic actuators and EP (electro/pneumatic) switches. The TS150 allows the dampers to be reopened after the initial closure for dynamic smoke control. The TS150 must be installed at the factory and cannot be added in the field. Replacement TS150’s may be field installed with the approval of the local authority.

**SMOKE DETECTION/TEST/POWER FAILURE OPERATION**

If smoke is detected, or during testing, or if power failure occurs, the damper will close and lock. When the smoke signal ceases (or smoke detector resets), the test is complete or power is restored the SYSTEM will automatically REMOTE RESET the damper to the open position. The damper automatically resets if nuisance alarms occur and the SYSTEM is reset. The damper may be closed at any time by placing the MCP1 (optional) or other control switch (by others) in the CLOSED position.

**FIRE OPERATION**

When the switch of a control panel (MCP) is in the NORMAL position and temperatures in excess of 165°F/74°C (212°F/100°C optional) are detected, the damper will close and lock and the damper CLOSED indicator light on the control panel will light. The damper remains closed until the override signal for smoke management from a remote command station is present and the duct temperature has not exceeded the high limit. The high limit temperature sensor prevents the damper from reopening when duct temperature is above the damper’s UL555S degradation test temperature of 250°F/121°C or 350°F/177°C. Upon cessation of the fire condition, the damper can be reopened by pressing the RESET button on the TS150 assembly. At no time will the damper disengage from the actuator. The integral SP100 will positively communicate to the fire commander via the control panel the position of the damper for smoke management purposes.

Refer to the appropriate damper installation instructions for details on damper installation. All electrical wiring and connections to the Fire-Stat must be in accordance with the standards of the authorities having jurisdiction.
SP100 SWITCH PACKAGE
FIELD INSTALLATION INSTRUCTIONS SUPPLEMENT

Fire/Smoke Damper Right Hand Mount Shown _ Left Hand Mount Similar

Smoke Damper Right Hand Mount Shown _ Left Hand Mount Similar
SP100 FIELD INSTALLATION INSTRUCTIONS

INSTALLATION

1. Obtain authorization from the local fire protection authority prior to installation of the SP100.

2. Verify all parts are included in parts kit (see item list).

3. SP100 must be linked to a power blade (power blades are all blades on parallel blade dampers and every other blade, starting with the bottom blade, on opposed blade dampers, see detail at right).

4. Refer to installation details on page 1. For fire/smoke dampers locate the blade bracket (#2) approximately 1 1/2" (38) above the center line of the blade and 2 1/8" (54) from the outside of the frame on a power blade. Mark and drill #30 (.128 dia.) hole and rivet the blade bracket to the blade with 2, 1/8" (3) pop rivets (#5). For smoke dampers install the blade bracket same as the fire/smoke damper except locate it 1 1/2" (38) below the center line of the blade.

5. For fire/smoke dampers locate the 1" (25) dia. hole for the SP100 3/8" (10) above and 5 3/8" (136) from the center line of the power blade. Slip the SP100 assembly trip wire into 1" (25) dia. hole and center trip wire in hole.

For smoke dampers install the SP100 same as the fire/smoke dampers except locate the 1" (25) dia. hole 2 7/8" (73) below the center line of the power blade.

If the 1" (25) dia. hole cannot be located as indicated, locate it as close as possible to the dimensions shown.

6. Attach the SP100 to the damper sleeve with (3) #10 screws and secure into place so SP100 does not rotate (screw heads will be on inside of box).

7. Insert the "Z" end of the link rod (#3) into the blade bracket (#2). Slip the other end over the trip lever on the SP100 (#1) and secure in place with 3/32" (2) push nut (#7).

8. Cycle the damper to verify switch actuation. Link rod may be formed as required to activate the switches (do not over stroke the switches).

Dimensions in parenthesis ( ) indicate millimeters.

SP100 WIRING

S1 – Damper position indicator switch. Closed when damper is closed.
S2 – Damper position indicator switch. Closed when damper is open.
B1 – Remote position indicator lamp.

S1 – Damper position indicator switch. Closed when damper is open.
S2 – Damper position indicator switch. Closed when damper is closed.
B1 – Remote position indicator lamp.
APPLICATION
The SP200 switch package on curtain fire dampers (IBD's and DIBD's), used in conjunction with the MCP3 (Single Control Station with Open/Closed Lights) provides the ability to remotely identify the damper’s blade position. Electrical interface with remote control on/off fan stations is also possible with the SP200.

OPERATION
The SP200 switch package consists of a switch box containing two damper position indicator switches. One switch closes when the blades are fully open and the second switch closes when the blades are fully closed. The switches positively communicate to the fire commander the position of the blades when interfaced with the fire command center.

Refer to the appropriate damper installation instructions for details on damper installation. All electrical wiring and connections to the SP100 must be in accordance with the National Electric code and the local authority with jurisdiction.

MICRO SWITCH SPECIFICATIONS
High temperature to 302°F (150°C)
Single pole, double throw
AMP Ratings:
- 15 AMPS, 1/2 HP, 125 OR 250 VAC
- 1/2 AMP, 125 VDC, 1/4 AMP, 250 VDC
- 5 AMPS, 120 VAC “L” (Lamp Load)
- 24 VDC, 1.5 AMPs
- 24 VAC, 10 AMPs

SP200 WIRING
SP200 LOCATION DETAILS

DETAIL 11
DETAIL 21
DETAIL 31
DETAIL 12
DETAIL 22
DETAIL 32
DETAIL 23

Standard Mounting Detail

(D)IBD Damper
2 x 4 Handy Box
SP-200
PFL PNEUMATIC FUSE LINK
OPERATION INSTRUCTIONS SUPPLEMENT

APPLICATION

The PFL is a UL Classified heat responsive device used in conjunction with Ruskin fire and smoke dampers. The PFL is standard on all fire and smoke dampers ordered with pneumatic actuators. Fire and smoke dampers ordered with pneumatic actuators may be ordered with the EFL and an EP (electric/pneumatic) switch. The PFL closes and locks the damper via a standard replaceable fuse link when temperatures in excess of 165°F (74°C), 212°F (100°C), or 285°F (141°C) are detected. The PFL must be installed at the factory and cannot be added in the field.

OPERATION

When the fusible link melts, air from the actuator is exhausted to close damper. The supply air continues to exhaust at the following rates:

<table>
<thead>
<tr>
<th>PSI</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXHAUST RATE CFM</td>
<td>.37</td>
<td>.47</td>
<td>.52</td>
<td>.55</td>
<td>.62</td>
</tr>
</tbody>
</table>

SWITCH PIPING DETAIL

Pneumatic actuators to be piped per local codes.

Electric actuators to be wired per the National Electric Code (NEC) and local codes. See actuator for wiring diagrams.

SEE COMPLETE MARKING ON PRODUCT
FUSE LINK ACCESSORIES
FOR IBD, CFD, FD, AND FSD MODELS

FUSE LINK
Specify 165°F, 212°F, or 285°F
(74°C, 100°C or 141°C)

Issue A Link
All (D)IBD Curtain Type Fire Dampers
Excluding IBDT Series

J Link
All CFD Ceiling Fire Dampers
All PFL’s (Pneumatic Fuse Links)

Issue B Link
For IBDT Curtain Type Fire Dampers
For FDR25 Round Fire Dampers
Also may be used as a replacement
on CFD Ceiling Fire Dampers

Issue E Link
FD35 and FD36
Multiple Blade Fire Dampers

FUSE LINK
Specify 165°F, 212°F, or 285°F
(74°C, 100°C or 141°C)

FD Fuse Link Assembly
1. Issue ‘E’ Fuse Link
2. Link bar
3. (2) ‘S’ Hooks
4. (2) 1/4-20 Nuts
5. (2) ‘E’ Clips

FDR Fuse Link Assembly
1. Issue ‘B’ Fuse Link
2. ‘J’ Bolt
3. (2) ‘S’ Hooks
4. (2) 1/4-20 Nuts

 Spec FLAP-110/Replaces FLAP-105
ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION. © Ruskin 2010
4935 FUSIBLE ROD (NO LONGER USED)
Specify 165°F or 212°F (74°C or 100°C)
for all FSD Series Combination Fire Smoke Damper models
(excluding FSDR25) manufactured prior to 1996
Refer to EFL or PFL spec sheets for dampers manufactured after 1996.

VOLUME ADJUST
Specify 165°F or 212°F (74°C or 100°C)
option for all Ceiling Fire Dampers (CFD's)

Lift arms are shown actual size.
Duct Smoke Detectors

System Sensor D4120 Flow Duct Smoke Detector
System Sensor 2151 No Flow Duct Smoke Detector
Hochiki DH-98 Flow Duct Smoke Detector
Air Products and Controls HS-100-P No-Flow Duct Smoke Detector
DEFINITION
The DSDF-D4120 is designed for use with Ruskin UL Classified Smoke and Combination Fire Smoke Dampers. The device detects the presence of smoke in the airstream of ductwork in HVAC systems operating at no less than 100 fpm up to 4000 fpm. DSDF-D4120 (flow rated duct smoke detectors) are factory mounted for “single point field power connection” to a standard Ruskin electronic fuse link (EFL) or optional firestat (TS150).

The DSDF-D4120 factory mounted with a smoke rated damper is intended to close the damper in accordance with International Building Codes. However, Ruskin’s smoke dampers may be setup for “Fail Open” operation, consult Ruskin for details. The DSDF-D4120 can be field wired back to a UL listed fire alarm panel by others.

APPROVAL
Underwriter’s Laboratories, Inc. does not have a separate Product Category for factory mounted smoke detectors. The smoke detector and the damper have been individually evaluated by their applicable UL standards.

Since the smoke detector is not rated for use at velocities below 100 fpm, local code may require an alternative means of damper closure such as zone detection or automated damper closure when the system fan is shut down. The local authority having jurisdiction should be consulted prior to installation of the damper and smoke detector.

APPLICATION
National and local safety standards and codes recognize the ability of air duct systems to transfer smoke, toxic gases and flame from area to area. Smoke can be a serious hazard to life safety unless blowers are shut down and dampers are actuated. The primary purpose of duct smoke detection is to prevent injury, panic and property damage by reducing the spread of smoke. Duct smoke detection can also serve to protect the air conditioning system itself from fire and smoke damage, and can be used to assist in equipment protection applications. Duct smoke detectors can be supplied by Ruskin in one of two ways:

1. Factory mounted for single point field wiring connection.
2. Shipped loose for field installation. see DSD5-D4120

DSDF DESCRIPTION/SPECIFICATION

Model: System Sensor D4120 with sensor component D4S
Type: Photoelectronic.
Velocity: 100 fpm to 4,000 fpm.
Dimensions (L x W x D): 14\(\frac{1}{8}\)\” x 5\” x 2\(\frac{1}{2}\)\” (365 x 127 x 64) or 7\(\frac{3}{4}\)\” x 9\” x 2\(\frac{1}{2}\)\” (197 x 229 x 64).
Weight: 2.5 lbs.
Operating Temperature Range: -4°F to 158°F (0° to 38°C).
Operating Humidity Range: 0% to 95%.
Operating Voltages: 24 VAC/VDC or 120/220 VAC operation.
Contact Ratings: Refer to information provided with detector.
Alarm Reset: Push button on DSDF-D4120 unit (remote reset optional with RTS2-AOS or RTS151KEY).

LISTINGS OF DSDF
• UL Listed, file S911.
• CSFM Listing #3242-1653:0207.
• FM # 3033744

ACCESSORIES
Annunciators, remote test and reset stations, sounders, strobes, etc. are available from the duct smoke detector manufacturer.

MAINTENANCE AND SERVICE OF DUCT DETECTORS
Dust, dirt and other foreign matter can accumulate inside a detector and change its sensitivity. Detectors should be tested and maintained periodically. Routine maintenance should be performed at least once a year and more frequently in dirtier environments. Refer to NFPA90A, NFPA72 and detector manufacturer’s instructions packaged with each detector for specific maintenance and testing information.

NOTE: Dimensions shown in parentheses ( ) indicate millimeters.
FACTORY MOUNTING DETAILS

The DSD-D4120 is standardly mounted on the opposite side of the sleeve from the actuator.

NOTE: Ruskin factory installs the duct smoke detector with holes in sampling tube pointed away from the damper. The sampling tube must be rotated in the field so the holes are pointed in the direction of the air flow. Minimum damper size is 8" wide x 6" high (203 x 152) (actual size).

Dsdf-D4120 Factory Wired to Fsd With Efl

EFL and 24 VAC Supply

Efl and 120 VAC Supply

Notes
1. Not all screw terminals φ in the DSD compartment are shown, for clarity.
2. These wiring diagrams apply to model D4120 duct smoke detector (made by System Sensor) with either photoelectric detector head.
3. // Indicated connections needed to be made in the field by qualified electrician.
NOTES
1. Not all screw terminals are shown in the DSD compartment for clarity.
2. These wiring diagrams apply to model D4120 duct smoke detector (made by System Sensor) with either photoelectric detector head.
3. Indicated connections needed to be made in the field by qualified electrician.

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
NOTES
1. Not all screw terminals in the DSD compartment are shown, for clarity.
2. These wiring diagrams apply to model D4120 duct smoke detector (made by System Sensor) with either photoelectric detector head.
3. // Indicated connections needed to be made in the field by qualified electrician.
1. Not all screw terminals in the DSD compartment are shown, for clarity.

2. These wiring diagrams apply to model D4120 duct smoke detector (made by System Sensor) with either photoelectric detector head.

3. // Indicated connections needed to be made in the field by qualified electrician.

FOR 120 VAC POWER SUPPLY

FOR 24 VAC POWER SUPPLY

NOTES
1. Not all screw terminals in the DSD compartment are shown, for clarity.
2. These wiring diagrams apply to model D4120 duct smoke detector (made by System Sensor) with either photoelectric detector head.
3. // Indicated connections needed to be made in the field by qualified electrician.
PRODUCT APPLICATION AND INSTALLATION INSTRUCTIONS

DSDN (SYSTEM SENSOR 2151) NO FLOW DUCT SMOKE DETECTORS

DEFINITION
The DSDN (No Flow Duct Smoke Detector) is designed for use with Ruskin UL555S classified smoke dampers. The device detects the presence of smoke in the airstream of ductwork in HVAC systems without a minimum operating velocity.

DSDN are factory mounted for “single point field power connection” to a standard Ruskin electronic fuse link (EFL) or optional firestat (TS150).

The DSDN factory mounted with a smoke rated damper is intended to close the damper only. Consult Ruskin prior to ordering if DSDN is to be wired back to a UL listed fire alarm panel.

APPROVAL
Underwriter's Laboratories, Inc. does not have a separate Product Category for factory mounted smoke detectors. The smoke detector and the damper have been individually evaluated by their applicable UL standards.

The local authority having jurisdiction should be consulted prior to installation of the damper and smoke detector.

APPLICATION
National and local safety standards and codes recognize the ability of air duct systems to transfer smoke, toxic gases and flame from area to area. Smoke can be a serious hazard to life safety unless blowers are shut down and dampers are actuated. The primary purpose of duct smoke detection is to prevent injury, panic and property damage by reducing the spread of smoke. Duct smoke detection can also serve to protect the air conditioning system itself from fire and smoke damage, and can be used to assist in equipment protection applications.

When presence of smoke in the duct is sensed, or when loss of power occurs the damper will fail close. Consult NFPA90A, NFPA72 documents and local codes to determine where smoke detectors are required.

DAMPERS
The DSDN can be factory mounted on any of the following Ruskin combination fire/smoke and smoke dampers: FSD60, 60-II, 60-3, 60-V, 37, 36, 35, 34, SD60, 60-II, 37, 36, 35, 34.

DSDN DESCRIPTION/SPECIFICATION
Model: System Sensor 2151
Base: B114LP - 120 VAC
       B114LPBT - 24 VAC/DC
Type: Photoelectronic.
Velocity: 0 to 3,000 fpm.
Dimensions (Dia.): 6.1”
Weight: 3.6 oz. (104g)
Operating Temperature Range: 32°F to 120°F (0° to 49°C).
Operating Humidity Range: 10% to 93% Relative Humidity.
Operating Voltages: 24 VAC/DC or 120 VAC operation.
Contact Ratings: Refer to information provided with detector.
Latching Alarm: Reset by momentary power interruption (not automatic.

LISTINGS OF DSDN
• UL Listed, file S911.
• CSFM Listing, 7272-1209:159.
• New York MEA-205-94-E
• Factory Mutual Approved, OX5A4.AY.

ACCESSORIES
Annunciators, remote test and reset stations, sounders, strobes, etc. are available from the duct smoke detector manufacturer.

MAINTENANCE AND SERVICE OF DUCT DETECTORS
Dust, dirt and other foreign matter can accumulate inside a detector and change its sensitivity. Detectors should be tested and maintained periodically. Routine maintenance should be performed at least once a year and more frequently in dirtier environments. Refer to NFPA90A, NFPA72 and detector manufacturer’s instructions packaged with each detector for specific maintenance and testing information.

SEE COMPLETE MARKING ON PRODUCT

©Ruskin 2014
FACTORY MOUNTING DETAILS

NOTES:
1) Consult Ruskin for minimum size for actuator in airstream.
2) Multiple detectors required for dampers larger than 36"w x 36"h (914 x 914). Consult Ruskin

TYPICAL INSTALLATION DETAILS FOR FSD with DSDN

Multiple detectors required for dampers larger than 36" x 36"h (914 x 914).
WIRING DIAGRAMS 120 VAC

DSDN FACTORY WIRED TO FSD WITH EFL

Fire Smoke Damper (FSD) with Electric Fuse Link (EFL)

NOTES
1. Not all screw terminals \( \varnothing \) in the DSDN compartment are shown, for clarity.
2. Switch “S” by others.
3. These wiring diagrams apply to model with either photoelectric or ionization detector head.
4. /// Indicated connections needed to be made in the field by qualified electrician.

Click to Return to: INDEX FSD SD IBD/DFD CFD
DSDN FACTORY WIRED TO FSD WITH TS-150

DSDN COMPARTMENT

DSDN FACTORY WIRED TO SMOKE DAMPER

DSDN COMPARTMENT

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
NOTES
1. Not all screw terminals in the DSD compartment are shown, for clarity.
2. Switch "S" by others.
3. These wiring diagrams apply to either photoelectric or ionization detector head.
4. Indicated connections needed to be made in the field by qualified electrician.
NOTES
1. Not all screw terminals Ø in the DSDN compartment are shown, for clarity.
2. Switch "S" by others.
3. These wiring diagrams apply to model with either photoelectric or ionization detector head.
4. Indicated connections needed to be made in the field by qualified electrician.
DEFINITION
The DSDF is designed for use with Ruskin UL Classified Smoke and Fire/Smoke Dampers. The device detects the presence of smoke in the airstream of ductwork in HVAC systems operating at no less than 300 fpm.

DSDF (flow rated duct smoke detectors) are factory mounted for "single point field power connection" to a standard Ruskin electronic fuse link (EFL) or optional firestat (TS150).

The DSDF factory mounted with a smoke rated damper is intended to close the damper in accordance with International Building Codes. However, Ruskin's smoke dampers may be setup for "Fail Open" operation, consult Ruskin for details. The DSDF can be field wired back to a UL listed fire alarm panel by others.

APPROVAL
Underwriter's Laboratories, Inc. does not have a separate Product Category for factory mounted smoke detectors. The smoke detector and the damper have been individually evaluated by their applicable UL standards.

Since the smoke detector is not rated for use at velocities below 300 fpm, local code may require an alternative means of damper closure such as zone detection or automated damper closure when the system fan is shut down. The local authority having jurisdiction should be consulted prior to installation of the damper and smoke detector.

APPLICATION
National and local safety standards and codes recognize the ability of air duct systems to transfer smoke, toxic gases and flame from area to area. Smoke can be a serious hazard to life safety unless blowers are shut down and dampers are actuated. The primary purpose of duct smoke detection is to prevent injury, panic and property damage by reducing the spread of smoke. Duct smoke detection can also serve to protect the air conditioning system itself from fire and smoke damage, and can be used to assist in equipment protection applications. Duct smoke detectors can be supplied by Ruskin in one of two ways:
1. Factory mounted for single point field wiring connection.
2. Shipped loose for field installation.

If the detector is shipped loose for field installation refer to the duct smoke detector manufacturer's installation instructions (shipped with each detector) for proper application.

When presence of smoke in the duct is sensed, or when loss of power occurs the damper will fail close. Consult NFPA90A, NFPA72 documents and local codes to determine where smoke detectors are required.

DAMPERS
The DSDF can be factory mounted on any of the following Ruskin combination fire/smoke and smoke dampers: FSD60, 60-2, 60-3, 60-V, 37, 36, 35, SD60, 60-2, 37, 36, 35.

DSDF DESCRIPTION/SPECIFICATION
Model: Hochiki DH-98 / SLR-24DH
Type: Photoelectronic (Consult Ruskin for availability of Ionization type detectors).
Velocity: 300 to 4,000 fpm.
Dimensions (L x W x D): 9½" x 7¼" x 2½" (232 x 184 x 57).
Weight: 3 lbs.
Operating Temperature Range: 32°F to 100°F (0° to 38°C).
Operating Humidity Range: 10% to 85% Relative Humidity.
Operating Voltages: 24 VAC/VDC or 120/220 VAC operation.
Contact Ratings: Refer to information provided with detector.
Alarm Reset: Push button on DSDF unit (not remote reset).

LISTINGS OF DSDF
• UL Listed, file S1383.
• CSFM Listing #3240-0410:155.
• FM # 3005751

ACCESSORIES
Annunciators, remote test and reset stations, sounders, strobes, etc. are available from the duct smoke detector manufacturer.

MAINTENANCE AND SERVICE
OF DUCT DETECTORS
Dust, dirt and other foreign matter can accumulate inside a detector and change its sensitivity. Detectors should be tested and maintained periodically. Routine maintenance should be performed at least once a year and more frequently in dirtier environments. Refer to NFPA90A, NFPA72 and detector manufacturer's instructions packaged with each detector for specific maintenance and testing information.

NOTE: Dimensions shown in parentheses ( ) indicate millimeters.
The DSD is standardly mounted on the opposite side of the sleeve from the actuator.

NOTE: Ruskin factory installs the duct smoke detector with holes in sampling tube pointed away from the damper. The sampling tube must be rotated in the field so the holes are pointed in the direction of the air flow. Minimum damper size is 8" wide x 6" high (203 x 152) (actual size).

DSD FACTORY WIRED TO FSD WITH EFL

NOTES
1. Not all screw terminals \( \varnothing \) in the DSD compartment are shown, for clarity.
2. Connectors between screw terminals 6, 7 & 8 are pre-wired by the DSD manufacturer. At smoke condition, contact between 6 & 7 breaks: contact between 7 & 8 makes.
3. Switch "S" by others.
4. These wiring diagrams apply to model DH-98 duct smoke detector (made by HOCHIKI) with either photoelectric or ionization detector head.
5. \// Indicated connections needed to be made in the field by qualified electrician.
DSD FACTORY WIRED TO FSD WITH EFL/SP100

NOTES
1. Not all screw terminals 7 in the DSD compartment are shown, for clarity.
2. Connectors between screw terminals 6, 7 & 8 are pre-wired by the DSD manufacturer. At smoke condition, contact between 6 & 7 breaks: contact between 7 & 8 makes.
3. Switch "S" lamp 1 and lamp 2 are by others.
4. These wiring diagrams apply to model DH-98 duct smoke detector (made by HOCHIKI) with either photoelectric or ionization detector head.
5. Indicated connections needed to be made in the field by qualified electrician.

Click to Return to: INDEX  FSD  SD  IBD/DFD  CFD
NOTES
1. Not all screw terminals in the DSD compartment are shown, for clarity.
2. Connectors between screw terminals 6, 7 & 8 are pre-wired by the DSD manufacturer. At smoke condition, contact between 6 & 7 breaks; contact between 7 & 8 makes.
3. Three position switch "S" lamp 1 and lamp 2 are by others.
4. These wiring diagrams apply to model DH-98 duct smoke detector (made by HOCHIKI) with either photoelectric or ionization detector head.
5. // Indicated connections needed to be made in the field by qualified electrician.
DSDF SHOWN SUPPLIED WITH FSDR25 (TRUE ROUND FIRE/SMOKE DAMPER)

CAN BE FACTORY SUPPLIED MOUNTED AND WIRED OR SHIPPED LOOSE.

ADDITIONAL WIRING DIAGRAM
DH-98-P

*Trouble contacts are shown in non-energized condition. Trouble contacts monitor power connected and head removed.
Installation requiring common functions must be wired as shown in Figure 5B.

Common functions include one or all of the following:

- Remote common alarm indication, remote pilot indication, remote common reset, common shutdown and common visual indication.
- Common fault indication (when green pilot LED is extinguished) cannot be achieved on the DH-98 Duct Units. Individual Remote Pilot LED's must be installed to monitor detector head or power source removal for each unit.
- In the event of an alarm, the detector head and duct unit alarm (Red) LED's will be illuminated. All remaining duct unit alarm LED's will not be illuminated. All remote alarm LED's fitted to the duct units will be illuminated when any of the units go into alarm. Only the duct unit in alarm will permit resetting of the system from the built in test/reset switch on that particular duct unit.
- A common Remote reset switch will reset all detectors.
DEFINITION

The DSDN (No Flow Duct Smoke Detector) is designed for use with Ruskin UL555S classified smoke dampers. The device detects the presence of smoke in the airstream of ductwork in HVAC systems without a minimum operating velocity.

DSDN are factory mounted for “single point field power connection” to a standard Ruskin electronic fuse link (EFL) or optional firestat (TS150).

The DSDN factory mounted with a smoke rated damper is intended to close the damper only. Consult Ruskin prior to ordering if DSDN is to be wired back to a UL listed fire alarm panel.

APPROVAL

Underwriter's Laboratories, Inc. does not have a separate Product Category for factory mounted smoke detectors. The smoke detector and the damper have been individually evaluated by their applicable UL standards.

The local authority having jurisdiction should be consulted prior to installation of the damper and smoke detector.

APPLICATION

National and local safety standards and codes recognize the ability of air duct systems to transfer smoke, toxic gases and flame from area to area. Smoke can be a serious hazard to life safety unless blowers are shut down and dampers are actuated. The primary purpose of duct smoke detection is to prevent injury, panic and property damage by reducing the spread of smoke. Duct smoke detection can also serve to protect the air conditioning system itself from fire and smoke damage, and can be used to assist in equipment protection applications.

When presence of smoke in the duct is sensed, or when loss of power occurs the damper will fail close. Consult NFPA90A, NFPA72 documents and local codes to determine where smoke detectors are required.

DAMPERS

The DSDN can be factory mounted on any of the following Ruskin combination fire/smoke and smoke dampers: FSD60, 60-II, 60-3, 60-V, 37, 36, 35, 34, SD60, 60-II, 37, 36, 35, 34.

DSDN DESCRIPTION/SPECIFICATION

Model: Air Products and Controls HS-100-P
Type: Photoelectronic.
Velocity: 0 to 3,000 fpm.
Dimensions (Dia.): 6”
Weight: 1.0 lb.
Operating Temperature Range: 32°F to 140°F (0° to 60°C).
Operating Humidity Range: 0% to 85% Relative Humidity.
Operating Voltages: 24 VAC/VDC, 120 VAC or 230 VAC.
Contact Ratings: Refer to information provided with detector.

LISTINGS OF DSDN

• UL Listed, file 52829.
• CSFM Listing, 3240-1004:118.
• New York MEA-73-92-E

ACCESSORIES

Consult Ruskin for the availability of annunciators, remote test and reset stations, sounders, strobes, etc.

SEE COMPLETE MARKING ON PRODUCT
FACTORY MOUNTING DETAILS

NOTES:
1) Minimum damper size is 8"w x 8"h (203 x 203).
2) Multiple detectors required for dampers larger than 36"w or 36"h (914 x 914).

TYPICAL INSTALLATION DETAILS FOR FSD with DSDN

Multiple detectors required for dampers larger than 36"w or 36"h (914 x 914).
FACTORY WIRING DIAGRAMS

DSDN FACTORY WIRED TO FSD WITH EFL
Use terminals 1 & 2 for 120VAC power supply (shown)
Use terminals 4 & 5 for 24VAC/VDC power supply
Use terminals 1 & 3 for 230VAC power supply

DSDN FACTORY WIRED TO FSD WITH EFL/SP-100
Use terminals 1 & 2 for 120VAC power supply (shown)
Use terminals 4 & 5 for 24VAC/VDC power supply
Use terminals 1 & 3 for 230VAC power supply

NOTES
1. Not all screw terminals in the DSDN compartment are shown, for clarity.
2. Switch “S” by others.
3. // Indicated connections needed to be made in the field by qualified electrician.
FACTORY WIRING DIAGRAMS

DSDN FACTORY WIRED TO FSD WITH TS-150
Use terminals 1 & 2 for 120VAC power supply (shown)
Use terminals 4 & 5 for 24VAC/VDC power supply
Use terminals 1 & 3 for 230VAC power supply

FOR 120 VAC POWER SUPPLY

DSDN FACTORY WIRED TO SMOKE DAMPER
Use terminals 1 & 2 for 120VAC power supply (shown)
Use terminals 4 & 5 for 24VDC power supply
Use terminals 1 & 3 for 230VAC power supply

NOTES
1. Not all screw terminals in the DSDN compartment are shown, for clarity.
2. Switch "S" by others.
3. // Indicated connections needed to be made in the field by qualified electrician.
Ceiling fire dampers are also known as “Radiation” dampers and that describes what makes them different from “standard” fire dampers. They are designed and tested to limit the radiant heat transfer through an air inlet/outlet opening in the ceiling membrane of a fire resistance rated floor/ceiling or roof/ceiling assembly. The Test Standard by which they are evaluated is UL555C.

Ceiling Fire Damper Selection
The process of selecting a ceiling fire damper involves one major consideration:

1. Floor/ceiling or roof/ceiling assembly design — Ceiling fire dampers are listed for use as a component in assemblies tested with an air inlet/outlet opening in the membrane. These assemblies have a specific hourly fire resistance rating and ceiling fire dampers can normally be used in any assembly with a restrained or unrestrained rating of 3 hours or less.

Ceiling Fire Damper Installation
Ceiling fire damper installations are typically classified as lay-in or surface mount. Figure 1 represents a lay-in installation and figure 2 represents a surface mount installation. Refer to the manufacturer’s UL approved installation instructions for specific information and details.

Ruskin ceiling fire (radiation) dampers provide protection to limit the radiative heat transfer through an air inlet/outlet opening in the ceiling membrane of a fire resistance rated floor/ceiling or roof/ceiling assembly.
RUSKIN®

Ceiling Radiation Dampers for wood construction

Selection & Application Guide for Wood Truss and Joist Floor/Ceiling or Roof/Ceiling Designs
CFD APPLICATION

Ceiling Fire Dampers are used in air handling duct inlets/outlets that penetrate the ceiling membrane of UL rated fire resistive floor-ceiling and roof-ceiling assemblies. Also, the CFD7T may be installed in the ceiling membrane of such assemblies that utilize the ceiling cavity as a return air plenum.

CFD TESTING

Ceiling Dampers are investigated to determine that the substitution of the ceiling damper does not reduce the hourly fire resistance rating of the assembly. Ceiling dampers are not assigned hourly ratings.

Fire resistive assemblies are investigated in accordance with UL263. After the ceiling assembly has been investigated, each floor-ceiling and roof-ceiling assemblies receives its own UL assembly design number.

CEILING DESIGNS

UL ceiling design numbers are actual tested hourly-rated fire resistive floor-ceiling and roof-ceiling assemblies. Each design shows construction, materials, and penetrations allowed in each design. Each manufactures listed product may be installed as shown on their design. (L586 and P548)

FIRE RESISTANCE MATERIAL CONSTRUCTION

Floor-ceiling and roof-ceiling assemblies constructed per the "International Building Codes" Chapter 7 may be constructed similar to UL designs, should have the local authorities approval for the damper model and installation.

NON-UL DAMPERS

Warnock Hersey and ARL testing labs test UL approved ceiling radiation dampers in optional ceiling designs and are labeled with ARL or Warnock Hersey labels. Not all areas of the country accept non-UL labeled products and all should have the local authority approval prior to installation.
APPLICATION
Non-ducted installations are used when the floor/ceiling or roof/ceiling cavity space is used as return air plenum which ductwork is not required. Also flex duct may be connected directly to the damper to eliminate the use of expensive insulated plenum boxes or boots.

Installation 1
CFD7T can be attached to angles resting on top of the bottom cord of the truss.

Installation 2
When the webbing of the truss interferes with the mounting angles, bend a leg up on the angles and attach to the sides of the trusses.

Installation 3
The CFD7T may be suspended with steel wires from steel angles or 2’x 4” attached to the top cord or the webbing of the trusses.

Note: installation depict standard installations, combining installation is permitted.
R4 OR R6 DUCTBOARD

APPLICATION
In areas where the duct is required to be insulated with either R4 or R6 insulation, the CFD7T can be factory or field supplied with R4 or R6 ductboard plenum or steel plenum with duct liner.

CFD7T insulated plenums may be supplied with side, end or top duct connections from 3” to 10” dia.

STEEL PLENUM BOX

APPLICATION
CFD7T can be supplied with various styles of steel boots or steel plenum boxes. Steel boots from a local supply house may be utilized with the CFD7T.

End Boot

Straight Boot

90 degree Boot

Steel Plenum Box with or without Duct liner
APPLICATION

CFD7(T) is the only UL approved radiation damper that can be used as supply/return air plenum to connect to AHU unit below the ceiling assembly.

Ductwork may be connected directly to the bottom side of the CFD7(T) from the AHU below. Retaining angles are utilized in lieu of steel grille flange that cover the gap in between the gypsum and the CFD7(T).

APPLICATION

CFD7 is the first Ceiling Radiation Damper to be UL listed for steel joist assemblies (Ref. L524). The CFD7 is listed on 21 different UL rated ceiling designs.

CFD7 can be supplied with or without a steel plenum box. The plenum is to be insulated in the field (Insulation is factory supplied).

APPLICATION

CFD7 is the first Ceiling Radiation Damper to be UL listed for 2” x 10” or 2” x 12” wood joist assemblies (Ref. L501). The CFD7 is listed on 21 different UL rated ceiling designs.

CFD7 installs with angles attached to the sides of the joist. Angles may be factory or field supplied.
**APPLICATION**

CFDR7T is the first True Round ceiling radiation damper UL approved for wood truss assemblies. The CFDR7T eliminated the use of expensive plenum boxes or boots. Now with this true round radiation dampers, architectural round diffuser with volume control may be used in place of square or rectangle flush mount diffuses.

Ductwork may be connected directly to the bottom side of the CFD7(T) from the AHU below. Retaining angles are utilized in lieu of steel grille flange that cover the gap in between the gypsum and the CFD7(T).

**STANDARD CEILING FIRE DAMPERS**

**APPLICATION**

UL Fire Rated Floor/Ceiling assemblies and Roof/Ceiling assemblies require specially tested and classified ceiling dampers to provide fire and heat protection where HVAC components penetrate the ceiling membrane.

Conventional fire dampers, which stop the spread of flame but DO NOT stop heat, are unacceptable for protecting fire rated ceilings.

Ceiling fire damper may be installed in floor/ceiling and roof/ceiling assemblies with fire ratings of 3 hours and less.
CFD8
Thin Line ceiling fire damper

CFD(R)2, CFD(R)3 and CFD4 ceiling fire damper for surface mount

CFD5
For lay-in ceiling application

Lay-In

Surface Mount
**Application**

UL Fire Rated Floor/Ceiling and Roof/Ceiling assemblies require specially tested and classified Ceiling Radiation Dampers (also called Ceiling Fire Dampers) to provide fire and heat protection where HVAC components penetrate or terminate the ceiling membrane.

Standard 1 ½ and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.

**CONSTRUCTION DETAILS**

UL Classification testing for ceiling fire dampers measures the heat transmitted through, and temperatures above, ceiling penetrations with ceiling dampers. Smaller dampers meet these criteria without thermal insulation, but larger dampers require insulation to provide acceptable performance.

- **CFD3** Rectangular dampers with area up to 70 square inches (452) meet UL criteria without blade insulation.
- **CFD2** Rectangular dampers with area above 70 square inches (452) to 324 square inches (2090) are provided with blade insulation.
- **CFD4** Rectangular dampers with area above 324 square inches (2090) to 576 square inches (3716) are provided with blade insulation.
- **CFDR3** Round dampers 10" (254) diameter and under meet UL criteria without blade insulation.
- **CFDR2** Round dampers above 10" (254) diameter through 20" (508) diameter are provided with blade insulation.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Models</td>
<td>Galvanized Steel (in gauges required by UL listing R8039)</td>
<td>Galvanized Steel, with UL Classified insulation as required (in gauges required by UL listing R8039)</td>
</tr>
</tbody>
</table>

**Support Hanger**

**CFD Ceiling Fire Damper**

**Ceiling Membrane**

**Grille or Diffuser**

**Typical CFD Installation**
INSTALLATION INSTRUCTIONS
CEILING DAMPERS
MODELS CFD(R)2, CFD(R)3, CFD(R)3.5, CFD4

APPLICATION
Models CFD(R)2, CFD(R)3, CFD(R)3.5, CFD4 and CFD(R)5 are UL labeled ceiling radiation dampers. When installed as shown, they provide appropriate protection for air inlet or outlet penetrations in the ceiling membrane of floor/ceiling and roof/ceiling assemblies with fire resistance ratings of up to 3 hours. These ceiling dampers are used in lieu of "hinged blade" dampers shown in some designs in the UL Fire Resistance Directory (FRD).

SYSTEM COMPONENTS
The ceiling damper and associated components (air devices, ducts, duct drops, hangar wire, etc.) must be constructed of steel. Flexible duct, if used, must be Class I or Class 0 type and bear the UL listing mark and be retained by 16 SWG minimum steel wire around the damper frame. The installations and air devices shown in these instructions illustrate general arrangements only. Installation must incorporate applicable requirements for the specific floor/ceiling or roof/ceiling construction in the UL Fire Resistance Directory.

CEILING PENETRATIONS
Ceiling penetrations should be located within ceiling tiles or panels without necessitating cuts in the ceiling suspension main runners or cross tees. If required, a maximum of one runner or cross tee may be cut to enable proper damper location and installation. Each cut end shall be supported by a minimum 12 SWG vertical hangar wire. A 1/2" (13) clearance must be maintained between the air inlet/outlet and the cut end of the runner or cross tee.

CONNECTIONS
Connections must be made using #8 sheet metal screws, 3/16" (4) tubular steel rivets, tack or spot welds spaced 6" (152) on center. Use a minimum of one connection per side for rectangular or square dampers and three equally spaced connections for round dampers. Connections must not interfere with damper blade operation.

Dimensions shown in parentheses ( ) indicate millimeters.
• Opening in ceiling membrane may be up to one inch larger than the nominal size of the ceiling radiation damper. For example a 12" x 12" (305 x 305) ceiling radiation damper could have a maximum ceiling membrane opening of 13" x 13" (330 x 330).

• Connection of ceiling radiation damper and air device may be satisfied in three ways:
  1. Ceiling radiation damper may be connected directly to the air device and supported by steel channel (see Detail 1).
  2. Ceiling radiation damper may be connected directly to the air device and supported by hanger straps (see Detail 2) or the hangar strap may be eliminated and the wires looped directly around the sheet metal screws. (see Loop Detail)
  3. Ceiling radiation damper may be connected directly to the air device and supported by direct suspension with wires looped through holes in the damper frame before tying (see Detail 3).

Non-Ferrous Air Devices
Ceiling membrane openings that utilize air device constructed from material other than steel require one of the following:
  1. A steel extension should extend from the ceiling radiation damper to the bottom surface of the ceiling membrane and the opening in the ceiling membrane should be equal to the outside of the steel extension (see Detail 4).
  2. A steel angle should be attached to the bottom of the ceiling radiation damper and span the gap from the ceiling radiation damper to the bottom of the ceiling membrane. The steel angle should overlap the ceiling membrane (see Detail 5). Note the steel angle may be installed on top or bottom of the ceiling membrane.

Ceiling Membrane Penetration
Penetrating the ceiling membrane may be accomplished by extending the damper frame or sleeve below the ceiling surface. Steel or flex duct may be attached to the damper/sleeve extension. (Rectangle steel duct may be attached with ‘S’-Slip connectors and round steel duct to be attached with maximum of 3 - #8 sheet metal screws). A steel angle is required per note 2 above. (Detail 6.)

IMPORTANT THERMAL BLANKET NOTE
This installation requires a thermal blanket if:
  • The distance from the face of the ceiling to the bottom of the closed damper blades exceed 1 1/2" (38). In which case a thermal insulating blanket must wrap around the damper (from top of ceiling membrane to closed damper blades) and be retained by a 16 SWG steel wire (refer to installation 4). The distance from the face of the ceiling to the bottom of the closed damper blades cannot exceed 5" (127) when a thermal blanket has been added as described.
• Opening in ceiling membrane may be up to one inch larger than the nominal size of the ceiling radiation damper. For example a 12" x 12" (305 x 305) ceiling radiation damper could have a maximum ceiling membrane opening of 13" x 13" (330 x 330).

• Connection of ceiling radiation damper, grille and steel duct drop may be satisfied in two ways:
  1. Ceiling radiation damper and grille neck may be connected directly to the duct drop (see Detail 1).
  2. Ceiling radiation damper may be connected directly to the grille neck and then the duct drop connected to the damper (see Detail 2).

Non-Ferrous Air Devices
Air devices that have non-ferrous frames.

Ceiling membrane openings that utilize air device constructed from material other than steel require one of the following:

1. A steel duct drop should extend to the bottom surface of the ceiling membrane and the opening in the ceiling membrane should be equal to the outside of the duct drop (see Detail 3).

2. A steel angle should be attached to the bottom of the ceiling radiation damper and span the gap from the ceiling radiation damper to the bottom of the ceiling membrane. The steel angle should overlap the ceiling membrane (see Detail 4). Note the steel angle may be installed on top or bottom of the ceiling membrane.

Ceiling Membrane Penetration
Penetrating the ceiling membrane may be accomplished by extending the damper frame or sleeve below the ceiling surface. Steel or flex duct may be attached to the damper/sleeve extension. (Rectangle steel duct may be attached with "S"-Slip connectors and round steel duct to be attached with maximum of 3 - #8 sheet metal screws). A steel angle is required per note 2 above. (Detail 5)

Non-Ferrous Air Devices
Air devices that have non-ferrous frames.

Ceiling membrane openings that utilize air device constructed from material other than steel require one of the following:

1. A steel duct drop should extend to the bottom surface of the ceiling membrane and the opening in the ceiling membrane should be equal to the outside of the duct drop (see Detail 3).

2. A steel angle should be attached to the bottom of the ceiling radiation damper and span the gap from the ceiling radiation damper to the bottom of the ceiling membrane. The steel angle should overlap the ceiling membrane (see Detail 4). Note the steel angle may be installed on top or bottom of the ceiling membrane.

Ceiling Membrane Penetration
Penetrating the ceiling membrane may be accomplished by extending the damper frame or sleeve below the ceiling surface. Steel or flex duct may be attached to the damper/sleeve extension. (Rectangle steel duct may be attached with "S"-Slip connectors and round steel duct to be attached with maximum of 3 - #8 sheet metal screws). A steel angle is required per note 2 above. (Detail 5)
• Opening in ceiling membrane may be up to one inch larger than
the nominal size of the ceiling radiation damper. For example a
12" x 12" (305 x 305) ceiling radiation damper could have a
maximum ceiling membrane opening of 13" x 13" (330 x 330).
• Connection of ceiling radiation damper and air device may be
satisfied in three ways:
  1. Ceiling radiation damper and air device may be connected
directly to the duct drop (see Detail 1).
  2. Ceiling radiation damper may be connected directly to the
air device and then the duct drop connected to the damper
(see Detail 2).

Non-Ferrous Air Devices
Ceiling membrane openings that utilize air device constructed from
material other than steel require one of the following:
1. A steel duct drop should extend to the bottom surface of the
ceiling membrane and the opening in the ceiling membrane
should be equal to the outside of the steel extension (see
Detail 3).
2. A steel angle should be attached to the bottom of the ceiling
radiation damper and span the gap from the ceiling radiation
damper to the bottom of the ceiling membrane. The steel
angle should overlap the ceiling membrane (see Detail 5).
Note the steel angle may be installed on top or bottom of the
ceiling membrane.

Ceiling Membrane Penetration
Penetrating the ceiling membrane may be accomplished by extend-
ing the damper frame or sleeve below the ceiling surface. Steel or
flex duct may be attached to the damper/sleeve extension.
(Rectangle steel duct may be attached with 'S'-Slip connectors and
round steel duct to be attached with maximum of 3 - #8 sheet metal
screws). A steel angle is required per note 2 above. (Detail 5)

IMPORTANT THERMAL BLANKET NOTE
This installation requires a thermal blanket if:
• The distance from the face of the ceiling to the bottom of the
closed damper blades exceed 1½" (38). In which case a ther-
mal insulating blanket must wrap around the damper (from top
of ceiling membrane to closed damper blades) and be retained
by a 16 SWG steel wire (refer to installation 4). The distance
from the face of the ceiling to the bottom of the closed damper
blades cannot exceed 5" (127) when a thermal blanket has
been added as described.
Application
The CFD8 is a “low profile” ceiling fire damper that maintains the integrity of fire resistive ceiling assemblies. The ceramic fiber blade is stacked to one side of the frame resulting in more “free area” than standard butterfly blade type ceiling dampers.

UL Fire Rated Floor/Ceiling and Roof/Ceiling assemblies require specially tested and classified Ceiling Dampers (also called Ceiling Fire Dampers) to provide fire and heat protection where HVAC components penetrate or terminate the ceiling membrane.

Standard 1 ½ and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Closure Springs</th>
<th>Hourly Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFD8</td>
<td>Galvanized Steel (in gages required by UL listing R5531)</td>
<td>Non-asbestos ceramic fiber</td>
<td>301 stainless steel</td>
<td>3</td>
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</table>

MAXIMUM UL CLASSIFIED DAMPER SIZES

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Single Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFD8</td>
<td>6”w x 6”h (152 x 152)</td>
<td>18”w x 18”h (457 x 457)</td>
</tr>
</tbody>
</table>
APPLICATION
The CFD8 is a UL labeled ceiling radiation damper. When installed as shown, it provides appropriate protection for air inlet or outlet penetrations in the ceiling membrane of floor/ceiling and roof/ceiling assemblies with fire resistance ratings of up to 3 hours. The CFD8 is used in lieu of “hinged blade” dampers shown in some designs in the UL Fire Resistance Directory (FRD).

SYSTEM COMPONENTS
The ceiling damper and associated components (air devices, ducts, duct drops, hangar wire, etc.) must be constructed of steel unless otherwise noted. Flexible duct, if used, must be Class I or Class 0 type and bear the UL listing mark and be retained by 16 SWG minimum steel wire around the damper frame. The installations and air devices shown in these instructions illustrate general arrangements only. Installation must incorporate applicable requirements for the specific floor/ceiling or roof/ceiling construction in the UL Fire Resistance Directory.

CEILING PENETRATIONS
Ceiling penetrations should be located within ceiling tiles or panels without necessitating cuts in the ceiling suspension main runners or cross tees. If required, a maximum of one runner or cross tee may be cut to enable proper damper location and installation. Each cut end shall be supported by a minimum 12 SWG vertical hangar wire. A 1/2” (13) clearance must be maintained between the air inlet/outlet and the cut end of the runner or cross tee.

CONNECTIONS
Connections must be made using #8 sheet metal screws, 3/16” (4) tubular steel rivets, tack or spot welds spaced 6” (152) on center. Use a minimum of one connection per side for rectangular or square dampers and three equally spaced connections for round dampers. Connections must not interfere with damper blade operation.

Dimensions shown in parentheses ( ) indicate millimeters.
• Opening in ceiling membrane may be up to one inch larger than the nominal size of the ceiling radiation damper. For example a 12" x 12" (305 x 305) ceiling radiation damper could have a maximum ceiling membrane opening of 13" x 13" (330 x 330).

• Connection of ceiling radiation damper and air device may be satisfied in three ways:
  1. Ceiling radiation damper may be connected directly to the air device and supported by steel channel (see Detail 1).
  2. Ceiling radiation damper may be connected directly to the air device and supported by hanger straps (see Detail 2) or the hangar strap may be eliminated and the wires looped directly around the sheet metal screws.
  3. Ceiling radiation damper may be connected directly to the air device and supported by direct suspension with wires looped through holes in the damper frame before tying (see Detail 3).

Non-Ferrous Air Devices

Ceiling membrane openings that utilize air device constructed from material other than steel require one of the following:

1. A steel extension should extend from the ceiling radiation damper to the bottom surface of the ceiling membrane and the opening in the ceiling membrane should be equal to the outside of the steel extension (see Detail 4).

2. A steel angle should be attached to the bottom of the ceiling radiation damper and span the gap from the ceiling radiation damper to the bottom of the ceiling membrane. The steel angle should overlap the ceiling membrane (see Detail 5).
• Opening in ceiling membrane may be up to one inch larger than the nominal size of the ceiling radiation damper. For example a 12" x 12" (305 x 305) ceiling radiation damper could have a maximum ceiling membrane opening of 13" x 13" (330 x 330).

• Connection of ceiling radiation damper, grille and steel duct drop may be satisfied in two ways:
  1. Ceiling radiation damper and grille neck may be connected directly to the duct drop (see Detail 1).
  2. Ceiling radiation damper may be connected directly to the grille neck and then the duct drop connected to the damper (see Detail 2).

Non-Ferrous Air Devices
Air devices that have non-ferrous frames. Ceiling membrane openings that utilize air device constructed from material other than steel require one of the following:
1. A steel duct drop should extend to the bottom surface of the ceiling membrane and the opening in the ceiling membrane should be equal to the outside of the duct drop (see Detail 3).
2. A steel angle should be attached to the bottom of the ceiling radiation damper and span the gap from the ceiling radiation damper to the bottom of the ceiling membrane. The steel angle should overlap the ceiling membrane (see Detail 4).
INSTALLATION 3
DUCTED SURFACE MOUNT SUPPORTED FROM STRUCTURE

• Opening in ceiling membrane may be up to one inch larger than the nominal size of the ceiling radiation damper. For example a 12" x 12" (305 x 305) ceiling radiation damper could have a maximum ceiling membrane opening of 13" x 13" (330 x 330).

• Connection of ceiling radiation damper and air device may be satisfied in three ways:
  1. Ceiling radiation damper and air device may be connected directly to the duct drop (see Detail 1).
  2. Ceiling radiation damper may be connected directly to the air device and then the duct drop connected to the damper (see Detail 2).

Non-Ferrous Air Devices
Ceiling membrane openings that utilize air device constructed from material other than steel require one of the following:
  1. A steel duct drop should extend to the bottom surface of the ceiling membrane and the opening in the ceiling membrane should be equal to the outside of the steel extension (see Detail 3).
  2. A steel angle should be attached to the bottom of the ceiling radiation damper and span the gap from the ceiling radiation damper to the bottom of the ceiling membrane. The steel angle should overlap the ceiling membrane (see Detail 5).
Application

UL Fire Rated Floor/Ceiling and Roof/Ceiling assemblies require specially tested and classified Ceiling Radiation Dampers (also called Ceiling Fire Dampers) to provide fire and heat protection where HVAC components penetrate or terminate the ceiling membrane. The CFD5 permits any manufacturer’s lay-in style steel ceiling diffuser to be installed in UL Classified F/C or R/C assembly with fire resistance ratings of 3 hour or less.

Standard 1 ½ and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.

CONSTRUCTION DETAILS

UL Classification testing for ceiling fire dampers measures the heat transmitted through, and temperatures above, ceiling penetrations with ceiling dampers.

CFD5  Rectangular dampers are provided with blade insulation.
CFDR5 Round dampers are provided with blade insulation.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper Models</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
<th>Frame</th>
<th>Blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFD5</td>
<td>6” x 6” (152 x 152)</td>
<td>18” x 18” (457 x 457)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
</tr>
<tr>
<td>CFDR5</td>
<td>5” Dia. (127)</td>
<td>20” Dia. (508)</td>
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<td></td>
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</tbody>
</table>
INSTALLATION INSTRUCTIONS
CEILING FIRE DAMPERS
MODELS CFD(R)5, CFD(R)5A

APPLICATION

Ceiling dampers maintain the integrity of the fire resistive membrane ceiling assembly with ratings of three hours or less, recessed-style ceiling diffusers. The thermal insulating blanket protects the exposed portion of the ceiling diffuser and protects the neck or inlet of the ceiling diffuser/damper. The floor/ceiling and roof/ceiling designs are illustrated in the current UL Fire Resistance Directory.

Ceiling Penetration

The four intersections of the cross-tees and main runner at the corners of the grid module containing the diffuser, or the midpoint of the cross-tees adjacent to the diffuser, shall be directly supported from the structural members of the floor or roof by 12 SWG minimum vertical hanger wires. When the duct extends over the intersections of the grid members, cold-rolled channels shall be used to ensure that the grid is supported from structural members by 12 SWG minimum hanger wires. Ceiling assemblies require lay-in ceiling panels be cut to fill the remainder of the 24" x 48" module and overlap the ceiling and members by a minimum of 3/8" (10).

MINERAL WOOL THERMAL BLANKET

The thermal insulation blanket is installed by laying it over the exposed surface of the ceiling diffuser. The Mineral Wool rests upon and protects exposed portions of the ceiling diffuser. The Refractory Ceramic Fiber is retained around the damper or diffuser neck by a 16 SWG minimum steel wire with the wire ends twisted tightly together.

The Thermal insulation blankets must cover all exposed horizontal and vertical back surface of the diffuser and fit inside adjacent tee bars.

Note:

Screws, bolts, rivets, etc., shall be a minimum of 3/16" (4.5) from the edge of the damper frame, duct drop, or grill frame and MUST NOT INTERFERE WITH BLADE OPERATION.

Damper to Grille Connections

Damper to Grille Attachment: Fasten the damper to the grille or diffuser frame with minimum of #8 sheet metal screws, 3/16" (4.5) steel rivet or tack welds spaced 6" O.C. Use a minimum of one connection per side. (For round dampers use a minimum of three screws, rivets or welds equally spaced.)

Damper to Duct Connections

Flex Duct Connection: Flex duct connection shall be made with steel clamp; 16 SWG wire; or cable ties.

Steel Duct Connection: Fasten the damper to the steel duct with minimum of #8 sheet metal screws; 3/16" (4.5) steel rivet; or tack welds spaced 6" O.C. Use a minimum of one connection per side. (For round dampers use a minimum of three screws, rivets or welds equally spaced.)

Damper and Duct Support

The duct can be supported by the damper and diffuser/grille assembly (refer to figure 2). Duct support is achieved by the use of minimum four 12 SWG hanging wires, looped around the ends of 16 MSG x 1 1/2" channels, attached to the damper by #10 sheet metal screws (refer to figure 2). The wires can also be looped directly around #10 sheet metal screws (one per side) which are attached directly to the damper (refer to figure 5 for hanging wire and loop detail). Round dampers require the use of minimum three hanging wires equally spaced around the circumference.

The duct can support the damper and diffuser/grille assembly. The duct supports the damper assembly by the use of minimum 16 MSG x 1 1/2" channels adjacent to both sides of the duct drop. 12 SWG hanging wires, looped around the ends of the channels, support the duct and attach to the ceiling structure. Damper hangars are not required in this application.
**X** DIMENSION

X dimension is the distance between the bottom of the ceiling to the blades in the closed position.

**Ducts 12” Diameter and Smaller**: When the "X" dimension is 4" (102) or smaller, insulation strips (Item 12) are not required.

**Ducts Above 12” Diameter**: When the "X" dimension is 2¾" (70) or smaller, insulation strips (Item 12) are not required.

**Insulating Strips** are required when the "X" dimension exceeds the above dimensions but not greater than 5" (127). Wrap the 3" (76) wide insulation strips around the neck of the damper/diffuser and attach with 16 SWG minimum steel wire with the wire ends twisted tightly together. Steel clamps or cable ties are also acceptable.

**ITEM DESCRIPTION**

1. Damper
2. Grille Frame (24 Ga. Min.)
3. Duct (where shown)
4. #8 Sheet Metal Screw
5. #10 Sheet Metal Screw
6. 16 MSG x 1½" Channel
7. Ceiling (UL Classified)
8. 12 SWG Steel Wire
9. Diffuser or Grille Core (Metallic or Non-Metallic)
10. 16 SWG Steel Wire
11. Thermal Blanket Insulation
12. Insulation strips (Refractory Ceramic Fiber or Mineral Wool)
CFD(R)7T and CFD7 Ceiling Fire Dampers
Ul555C Classified
1 HR. Rating for Wood Construction

Application
CFD7T is a UL Classified Ceiling Fire Damper that is UL listed for installation in wood truss floor/ceiling and roof/ceiling designs. Unlike other ceiling dampers for wood truss applications, the CFD7T does not require additional damper insulation or boot/box enclosures to meet UL approved installation requirements. In addition the CFD7T is listed for through ceiling membrane penetration.

Standard 1 1/2 and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.

Application
The CFD7 is a UL classified Ceiling Fire Damper that is listed for installation in ceilings constructed from wood joist or steel joist. The CFD7 is supplied with a ceramic fiber insulating blanket to be field applied over a steel plenum box. The steel plenum box with the insulating blanket, must fit between the joist with a minimum of clearance of ¾” (19).

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper Models</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
<th>Frame</th>
<th>Blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFD7</td>
<td>4” x 4” (102 x 102)</td>
<td>18” x 18” (457 x 457)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
</tr>
<tr>
<td>CFD7T</td>
<td>4” x 4” (102 x 102)</td>
<td>16” x 12” (406 x 305)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
</tr>
<tr>
<td>CFDR7T</td>
<td>5” Dia.</td>
<td>18” Dia. (457)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
<td>Galvanized Steel (In gages required by UL listing R8039)</td>
</tr>
</tbody>
</table>
INSTALLATION INSTRUCTIONS
CEILING DAMPERS FOR WOOD TRUSS ASSEMBLIES
MODEL CFD7-T

APPLICATION
Model CFD7-T is designed to function as a heat barrier in HVAC openings penetrating ceilings constructed from wood trusses. The CFD7-T has been UL tested to provide protection in UL ceiling design L528, L558, L574, L586, P533, P545 and P548 without the added requirement for insulated boots, boxes or plenums.

SYSTEM COMPONENTS
The ceiling damper and associated components (air devices, duct, duct drop, etc.) must be constructed of steel. The grille/diffuser frame shall be minimum of 26 gauge (0.55) steel. Non-ferrous air devices or through ceiling membrane penetration a steel plaster flange is required. Flexible duct must be class 0 or 1 type and bear the UL listing mark and shall be attached to the plenum collar with steel clamps, plastic straps, or minimum 18 gauge steel wire. Fiberglass ductboard plenum box shall be UL 181 listed. Field supplied plenum boxes not to exceed 10 lb. The installation and air device shown in these instructions illustrate general arrangements only. Installation must incorporate applicable requirements for the specific Floor/ceiling or Roof/ceiling construction in the UL Fire Resistance Directory.

CEILING PENETRATIONS
Ceiling penetrations should be located between adjacent truss and RC or Furring channels. If required, a maximum of one RC or Furring channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8” (3) on any side.

FASTENERS
Support Angle to Damper: minimum of two #8 sheet metal screws, 3/16" (4) tubular rivets, tack or spot-welds per angle.
Support Angle to Truss: minimum of #8 x 3/4” long screw or #6 penny nail 1” long (25).
Grill/Diffuser frame to damper: minimum of two #8 x 1 1/4” (32) min. screws through the ceiling material and into the plaster flange or sub-frame.
Retaining Angle to Plaster Flange or Sub-frame: minimum of #8 x 1 1/4” (32) min. screws through the ceiling material and into the plaster flange or sub-frame. One screw per side required on units 10” (254) long and under, and two screws per side on units above 10” (254) long. Round units maximum of 3 screws required.
Make sure fasteners do not interfere with the damper operation.

Unducted
Steel Boot
Steel or Ductboard Plenum Box

II-CFDWT-614/Replaces II-CFDWT-613
INSTALLATION 1
UNDUCTED OR FLEX DUCT

With Grille Diffuser

Through Ceiling Membrane Penetration

ITEM DESCRIPTION
1. Wood Truss Assembly (Refer to UL Fire Resistance Directory)
2. RC Channel or Furring Channel or Steel Framing Members
3. UL rated gypsum wallboard (See UL design No.)
4. Ceiling Radiation Damper
5. 3/4" x 3/4" x 16ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x .85) Support Angle (2 sides) See Note 1

6. Steel Frame Grille Diffuser
7. 1" x 1" x 22 ga. (25 x 25 x .85) Retaining Angle on all 4 sides
8. Sub-frame or plaster flange
9. Insulation (optional)

ALTERNATE SUPPORT ANGLE INSTALLATION
Cut the vertical leg of the support angle and fold up 90° both ends. Attach support angle to the inside leg of the truss with minimum of 2 - #8 screws or nails per angle.
INSTALLATION 2
With Steel Plenum Box

INSTALLATION 3
Through Ceiling Membrane Penetration and
Steel Plenum Box

ITEM DESCRIPTION
1. Wood Truss Assembly (Refer to UL Fire Resistance
   Directory)
2. RC Channel or Furring Channel or Steel Framing Members
3. UL rated gypsum wallboard (See UL design No.)
4. Ceiling Radiation Damper
5. 3/4" x 3/4" x 16 ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38
   x 38 x .85) Support Angle (2 sides) See Note 1
6. Steel Frame Grille Diffuser
7. 1" x 1" x 22 ga. (25 x 25 x .85) Retaining Angle on all 4 sides
8. Sub-frame or plaster flange
9. Steel Plenum Box or Boot
10. Duct (optional)
11. Insulation (optional)

ALTERNATE
SUPPORT ANGLE
INSTALLATION
Cut the vertical leg of the
support angle and fold up
90° both ends. Attach
support angle to the
inside leg of the truss with
minimum of 2 - #8 screws
or nails per angle.

ALTERNATE
DAMPER SUPPORT
Damper support may be
achieved by suspending
the damper from support
angles Item #5 or 2" x 4"
(51 x 102) wood stud fas-
tened to adjacent trusses
and the damper suspend-
ed with four 18 swg steel
wire or 3/4" x 3/4" x 26 ga.
(16 x 16 x .55) angle tabs
spaced evenly around the
damper.
INSTALLATION 5
With Ductboard Plenum Box

INSTALLATION 6
Through Ceiling Membrane Penetration
and Ductboard Plenum Box

ITEM DESCRIPTION
1. Wood Truss Assembly (Refer to UL Fire Resistance Directory)
2. RC Channel or Furring Channel or Steel Framing Members
3. UL rated gypsum wallboard (See UL design No.)
4. Ceiling Radiation Damper
5. 3/4" x 3/4" x 16ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x .85) Support Angle (2 sides) See Note 1
6. Steel Frame Grille Diffuser
7. 1" x 1" x 22 ga. (25 x 25 x .85) Retaining Angle on all 4 sides
8. Sub-frame or plaster flange
9. Ductboard Plenum Box
10. Duct
11. 30 ga. (.25) Steel Sleeve min.

Note: See Supplemental Installation Instruction for ductboard Plenum construction.

SHEETMETAL WRAPPED DUCTBOARD INSTALLATION

ALTERNATE DAMPER SUPPORT
Damper support may be achieved by suspending the damper from support angles Item #5 or 2" x 4" (51 x 102) wood stud fastened to adjacent trusses and the damper suspended with four 18 swg steel wire or 3/4" x 3/4" x 26ga. (16 x 16 x .55) angle tabs spaced evenly around the damper.

ALTERNATE SUPPORT ANGLE INSTALLATION
Cut the vertical leg of the support angle and fold up 90° both ends. Attach support angle to the inside leg of the truss with minimum of 2 - #8 screws or nails per angle.
INSTALLATION INSTRUCTIONS
CEILING DAMPERS FOR WOOD TRUSS ASSEMBLIES
MODEL CFDR7-T

APPLICATION
Model CFDR7-T is designed to function as a heat barrier in HVAC openings penetrating ceilings constructed from wood trusses. The CFDR7-T has been UL tested to provide protection in UL ceiling design L528, L558, L574, L586, P533, P545 and P548 without the added requirement for insulated boots, boxes or plenums.

SYSTEM COMPONENTS
The ceiling damper and associated components (air devices, duct, duct drop, etc.) must be constructed of steel. The grille/diffuser frame shall be minimum of 26 gauge (0.55) steel. Non-ferrous air devices or through ceiling membrane penetration a steel plaster flange is required. Flexible duct must be class 0 or 1 type and bear the UL listing mark and shall be attached to the plenum collar with steel clamps, plastic straps, or minimum 18 gauge steel wire. Installation must incorporate applicable requirements for the specific Floor/ceiling or Roof/ceiling construction in the UL Fire Resistance Directory.

CEILING PENETRATIONS
Ceiling penetrations should be located between adjacent truss and RC or Furring channels. If required, a maximum of one RC or Furring channel may be cut or notched to enable proper damper location. The clearance between the damper assembly and the cutout in the ceiling material shall be a maximum of 1/8” (3) on any side.

FASTENERS
Support Angle to Damper: minimum of two #8 sheet metal screws, 3/16” (4) tubular rivets, tack or spot-welds per angle.
Support Angle to Truss: minimum of #8 x 3/4” long screw or #6 penny nail 1” long (25).
Grill/Diffuser frame to damper: minimum of two #8 x 1 1/4” (32) min. screws through the ceiling material and into the plaster flange or sub-frame.
Retaining Angle to Plaster Flange or Sub-frame: minimum of #8 x 1 1/4” (32) min. screws through the ceiling material and into the plaster flange or sub-frame. One screw per side required on units 10” (254) long and under, and two screws per side on units above 10” (254) long. Round units maximum of 3 screws required.
Make sure fasteners do not interfere with the damper operation.

California State Fire Marshal Listing No. 3226-0245:0123
INSTALLATION
UNDUCTED OR FLEX DUCT

**With Grille Diffuser**

1. Wood Truss Assembly (Refer to UL Fire Resistance Directory)
2. RC Channel or Furring Channel or Steel Framing Members
3. UL rated gypsum wallboard (See UL design No.)
4. Ceiling Radiation Damper
5. ¾” x ¾” x 16 ga. (19 x 19 x 1.61) or 1½” x 1½” x 22 ga. (38 x 38 x .85) Support Angle (2 sides) See Note 1

**Through Ceiling Membrane Penetration**

6. Steel Frame Grille Diffuser
7. 1” x 1” x 22 ga. (25 x 25 x .85) Retaining Angle on all 4 sides
8. Sub-frame or plaster flange
9. Insulation (optional)

**ALTERNATE SUPPORT ANGLE INSTALLATION**
Cut the vertical leg of the support angle and fold up 90° both ends. Attach support angle to the inside leg of the truss with minimum of 2 - #8 screws or nails per angle.

**ALTERNATE DAMPER SUPPORT**
Damper support may be achieved by suspending the damper from support angles Item #5 or 2” x 4” (51 x 102) wood stud fastened to adjacent trusses and the damper suspended with four 18 swg steel wire or 3½” x 3½” x 26 ga. (16 x 16 x .55) angle tabs spaced evenly around the damper.
APPLICATION


ITEM DESCRIPTION

1. Floor - Ceiling UL rated (See application section for design number).
2. Steel box minimum of 24 gage.
3. 3/4" x 3/4" 20 gage Mounting Angle
4. #6 Nail or #8 Wood Screw
5. #8 Sheet metal Screw or Rivet
6. 1/2" thick Thermal Blanket (all sides)
7. 16 SWG Steel wire, Steel Clamp or Nylon Zip Tie
8. 2" x 4" Wood Brace
9. Damper Assembly
10. Duct (if required)
11. 24 gage x 1" wide Duct Support on 24" centers

Notes:
1. CFD's are shipped from the factory with the blades in the closed position. The fusible link must be installed to hold the blades in the open position at the time of installation.
2. Screws, bolts, rivets, etc, MUST NOT INTERFERE WITH BLADE OPERATION.
3. Flex duct must be UL listed class I or 0. Steel duct minimum 28 (.50) gage and maximum of 20 (.9) gage.
4. The ceiling damper and its components must be installed and supported as illustrated.
5. Minimum clearance between the damper and joist 3/4" (19).

CEILING PENETRATION

Ceiling penetrations should be located in-between floor/ceiling joist. The opening in the gypsum board should have no gaps larger than 1/16" (1.5) between the damper frame and the gypsum board.
Support
The damper assembly is to be supported by 2 - \( \frac{3}{4} \) x \( \frac{3}{4} \) (19 x 19) angle bent into a channel and attached to the joist with a minimum of (2) #6 nails.

Installation
1. Attach the damper to the mounting angles with minimum of #8 sheet metal screw or \( \frac{3}{16} \) (4.5) dia. rivet. Minimum 2 per angle and maximum of 2" (51) from edge to damper.
2. The damper assembly is to be attached to the wood joist by the 2 - \( \frac{3}{4} \) x \( \frac{3}{4} \) (19 x 19) angle bent into a channel and fastened to the joist with a minimum of (2) #6 nails per side.
3. Wrap the damper assembly with \( \frac{1}{2} \) (13) thick Thermal Blanket (supplied by Ruskin). Secure the thermal blanket to the damper with minimum of 16 SWG steel wire or steel clamp (supplied by others).

Note:
Installation without the insulation does not provide protection of the opening. Insulation must cover surfaces as shown.
**OPTIONAL FIELD INSTALLED SLEEVE**

**Damper Sleeve and End Cap**
Sleeve thickness to be minimum of 24 gage (.7) steel and constructed per SMACNA HVAC Duct Construction Standards or see below for option.

**Branch Connections**
Round or Square connections cannot exceed 51 sq. in. and connected to the sleeve per SMACNA HVAC Duct Construction Standards or see below for option.

**Fasteners**
#8 bolts or screws, 1/8” (3) steel rivets, spot welds or 1/2” (13) long tack welds.

**Fastener Spacing**
Fasten the sleeve to the CFD7 with minimum of 2 bolts, screw, rivets or welds per side.

---

**ITEM DESCRIPTION**

1. CFD7 Ceiling Fire Damper
2. Sleeve 24 ga. (.7) minimum
3. End Cap 24 ga. (.7) minimum
4. Collar
5. Fasteners

**Note:** CFD7 are shipped with 1/2” (13) thick thermal blanket for field installation.

---

**Optional Branch Connection**

![Optional Branch Connection Diagram]

**Optional Sleeve and End Cap Seams**

![Optional Sleeve and End Cap Seams Diagram]

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**ITEM DESCRIPTION**

1. CFD7 Ceiling Fire Damper
2. Sleeve 24 ga. (.7) minimum
3. End Cap 24 ga. (.7) minimum
4. Collar
5. Fasteners

**Note:** CFD7 are shipped with 1/2” (13) thick thermal blanket for field installation.
APPLICATION
Fiberglass ductboard plenum box used in conjunction with ceiling damper models CFD(R)2, CFD(R)3, CFD(R)3.5 and CFD4. Refer to UL Fire Resistance Directory for details on floor/ceiling and roof/ceiling designs.

SYSTEM COMPONENTS
Fiberglass ductboard shall be UL 181 listed and not to exceed 10 lbs. in weight. Seam to be sealed with UL 181 listed tape. The ductboard plenum to be connected to the ceiling damper with UL 181 listed tape. Ductboard may be wrapped with minimum of 30 gage steel and connected to ceiling damper frame minimum of two #6 sheet metal screws. 1/8" (3) tubular rivets, tack or spot-welds per side.
CFD7 INSTALLATION SUPPLEMENT FOR CEILING DESIGN G548

APPLICATION

Ceiling fire dampers maintain the integrity of the fire resistive ceiling assembly. The floor/ceiling design G548 is illustrated in the current UL Fire Resistance Directory.

Notes:
1. CFD's are shipped from the factory with the blades in the closed position. The fusible link must be installed to hold the blades in the open position at the time of installation.
2. Screws, bolts, rivets, etc, MUST NOT INTERFERE WITH BLADE OPERATION.
3. Duct to be supported by steel channel and 18 ga. wire or 18 ga. wire connected from tabs on deck. 24" (610) maximum center to center.
4. Dimensions shown in parentheses ( ) indicate millimeters.

ITEM DESCRIPTION
1. Normal Weight Concrete
2. Steel Floor and Form Units
3. Steel Joist
4. Isolation-Beam (Not Shown)
5. Horizontal Bridging
6. Furring Channels
7. Batts and Blankets
8. Gypsum Board
9. CFD7
10. Steel Channel 16 ga x 1 1/2" (38)
11. #18 SWG Wire
12. Duct with duct support on 24" centers (Note 3)
13. #8 Screw
14. #16 SWG Wire
15. 1/2" (13) thick Thermal Blanket

SEE COMPLETE MARKING ON PRODUCT

Channel Support Detail

Click to Return to: INDEX FSD SD IBD/DFD CFD
Installation

1. Ceiling penetration should be located in between floor/ceiling or ceiling/roof joist. The opening in the gypsum board should have no gaps larger than $\frac{1}{16}$" (1.5) between the damper frame and the gypsum board.

2. Attach the 16 ga. x 1 1/2" (38) steel channels to the steel joist with #18 SWG wire (item #11).

3. Support the damper by tying the #18 SWG wire to the steel channel. Then loop the other end of the wire around #8 screw into the bottom of the damper.

4. Wrap the damper assembly with $\frac{1}{2}$" (13) thick thermal blanket (supplied by Ruskin). Secure the thermal blanket to the damper with minimum of 16 SWG steel wire or steel clamp (supplied by others).

Note:
1. Installation without the insulation does not provide protection of the opening. Insulation must cover surfaces as shown.
2. See CFD7 Installation Instructions for optional field installed sleeve.

ITEM DESCRIPTION

1. Normal Weight Concrete
2. Steel Floor and Form Units
3. Steel Joist
4. Isolation-Beam (Not Shown)
5. Horizontal Bridging
6. Furring Channels
7. Batts and Blankets
8. Gypsum Board
9. CFD7
10. Steel Channel 16 ga x 1 1/2" (38)
11. #18 SWG Wire
12. Duct with 1" (25) wide duct support on 24" (610) centers
13. #8 Screw
14. #16 SWG Wire
15. $\frac{1}{2}$" (13) thick Thermal Blanket
CFD7 INSTALLATION SUPPLEMENT FOR CEILING DESIGN L524

APPLICATION

Ceiling fire dampers maintain the integrity of the fire resistive ceiling assembly. The floor/ceiling designs L524 is illustrated in the current UL Fire Resistance Directory.

ITEM DESCRIPTION

1. Floor or roof assembly
2. Steel box minimum 24 gage.
3. 3/4" x 3/4" 20 gage mounting angle
4. Minimum #8 sheet metal screw or rivet
5. 1/2" thick Thermal Blanket (all sides)
6. 16 SWG steel wire, steel clamp or nylon zip tie
7. Ceiling damper assembly
8. Duct (if required)
9. 24 gage x 1" wide duct support on 24" centers
10. Steel joist

Notes:

1. CFD's are shipped from the factory with the blades in the closed position. The fusible link must be installed to hold the blades in the open position at the time of installation.
2. Screws, bolts, rivets, etc, MUST NOT INTERFERE WITH BLADE OPERATION.
3. The ceiling damper and its components must be installed and supported as illustrated.
4. Dimensions shown in parentheses ( ) indicate millimeters.
Installation

1. Ceiling penetration should be located in between floor/ceiling or ceiling/roof joist. The opening in the gypsum board should have no gaps larger than 1/16" (1.5) between the damper frame and the gypsum board.

2. Attach the 16 ga. x 1 1/2" (38) steel channels to the steel joist with #18 SWG wire (item #11).

3. Support the damper by tying the #18 SWG wire to the steel channel. Then loop the other end of the wire around #8 screw into the bottom of the damper.

4. Wrap the damper assembly with 1/2" (13) thick Thermal Blanket (supplied by Ruskin). Secure the thermal blanket to the damper with minimum of 16 SWG steel wire or steel clamp (supplied by others).

Note:
1. Installation without the insulation does not provide protection of the opening. Insulation must cover surfaces as shown.
2. See CFD7 Installation Instructions for optional field installed sleeve.

ITEM DESCRIPTION

1. Floor or roof assembly
2. Steel box minimum 24 gage.
3. 3/4" x 3/4" 20 gage mounting angle
4. Minimum #8 sheet metal screw or rivet
5. 1/2" thick Thermal Blanket (all sides)
6. 16 SWG steel wire, steel clamp or nylon zip tie
7. Ceiling damper assembly
8. Duct (if required)
9. 24 gage x 1" wide duct support on 24" centers
10. Steel joist
CFD2W AND CFD3W CEILING FIRE DAMPERS
WARNOCK HERSEY CLASSIFIED RADITION DAMPER
1 HR. RATING

APPLICATION
Fire Rated Floor/Ceiling and Roof/Ceiling assemblies require specially tested and classified Ceiling Radiation Dampers (also called Ceiling Fire Dampers) to provide fire and heat protection where HVAC components penetrate or terminate the ceiling membrane.

CONSTRUCTION DETAILS
Classification testing for ceiling fire dampers measures the heat transmitted through, and temperatures above, ceiling penetrations with ceiling dampers. Smaller dampers meet these criteria without thermal insulation, but larger dampers require insulation to provide acceptable performance.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFD3W</td>
<td>Rectangular dampers with area up to 70 square inches (452) meet UL criteria without blade insulation.</td>
</tr>
<tr>
<td>CFD2W</td>
<td>Rectangular dampers with area above 70 square inches (452) to 324 square inches (2090) are provided with blade insulation.</td>
</tr>
<tr>
<td>CFDR3W</td>
<td>Round dampers 10” (254) diameter and under meet UL criteria without blade insulation.</td>
</tr>
<tr>
<td>CFDR2W</td>
<td>Round dampers above 10” (254) diameter through 20” (508) diameter are provided with blade insulation.</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Models</td>
<td>Galvanized Steel</td>
<td>Galvanized Steel</td>
</tr>
</tbody>
</table>
APPLICATION
Models CFD(R)2W, CFD(R)3W, CFD(R)3.5W and CFD4W ceiling fire dampers are designed and Warnock Hersey tested for installation in wood truss with gypboard ceiling applications.

GENERAL INSTRUCTIONS
1. Maximum opening size in the ceiling membrane equals the maximum size of the ceiling fire damper.
2. The opening in the ceiling membrane may be up to one inch larger than the size of the ceiling fire damper.
3. Measure the actual spacing between the wood framing members and cut the vertical leg of the mounting angles to length plus 6 inches. Two mounting angles are required. Fold up 3 inches at 90° at both ends of the mounting angle and attach it to the wood frame with minimum of 2 each #6 penny nails or #8 screws.
4. The damper is attached to the mounting angle by sheet metal screws. A minimum of 2 screws per angle is required for rectangular dampers and a minimum of 1 screw per angle for round dampers.
5. On the sides opposite the retaining angles, a three inch long mounting clip is required. Make attachments as shown in figure 1. Make 2 attachments per mounting clip for rectangular dampers and 1 attachment per mounting clip for round dampers. The bottom leg of mounting clip rests on the ceiling material.

Notes:
1. Figures 2 and 3 (page 2) show top views of a rectangular and round damper installation, respectively.
2. Figure 4 shows the “through penetration” installation of a damper in a galvanized steel sleeve which extends three inches above and below the rated ceiling.
**Application**

The DFSDR1 is two dampers in one. DFSDR1 is a one hour fire rated, UL labeled Corridor Damper leakage class 1 and designed to be used in openings in the ceilings of wood stud or metal stud constructed interior tunnel corridors. Also the DFSDR1 is classified as a ceiling damper with a three hour fire resistance rating. (See DFSDR1 in the Ceiling Fire Damper)

As a UL555C ceiling damper it is designed for installation in fire rated floor/ceiling or roof/ceiling assemblies to provide protection where HVAC components penetrate the ceiling membrane (See Ceiling Fire Dampers).

**FEATURES**

- Corridor dampers are produced in an ISO 9001 certified factory.
- Warranted to be free from defects in material and workmanship for a period of 5 years after date of shipment.

**ACTUATORS/ HEAT SENSOR DEVICE**

- Actuators shall be qualified in accordance with UL555S to an elevated temperature of 250°F (121°C) or 350°F (177°C).
- Factory mounted electric or pneumatic actuators.
- Quick detect heat-actuated temperature release device. Electronic Fuse Link (EFL) or Pneumatic Fuse Link (PFL).

**OPTIONS**

- FM Approvals as Specification Tested Product.
- DTS (Damper Test Switch) test switch for cycle testing.
- TS150 for re-openable operation in dynamic smoke management systems.
- SP100 Switch Package to allow remote indication of damper blade position.
- MCP Control panels for testing or monitoring purpose or smoke management systems.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Frame</th>
<th>Blades</th>
<th>Bearings</th>
<th>Blade Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFSDR1</td>
<td>20 gage (1.0) galvanized steel 12” (305) long</td>
<td>Two-piece 14 gage (1.9) equivalent thickness galvanized steel.</td>
<td>Stainless steel sleeve type, pressed into frame</td>
<td>Silicone edge type sandwiched between two piece blades. Full circumference smoke seal to 450°F (232°C).</td>
</tr>
</tbody>
</table>

**MAXIMUM UL CLASSIFIED DAMPER SIZES**

<table>
<thead>
<tr>
<th>Damper</th>
<th>Minimum Size</th>
<th>Maximum Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFSDR1</td>
<td>6” Dia. (152)</td>
<td>12” Dia. (305)</td>
</tr>
</tbody>
</table>
APPLICATION
The DFSDR1 is a Corridor Fire/Smoke Damper and a Ceiling Damper. As a Corridor Fire/Smoke Damper it is designed for installation in the ceiling penetration of "tunnel type" corridors constructed from metal studs. As a Ceiling Damper it is designed for use in the 1 hour fire rated floor-ceiling or roof-ceilings as shown in the UL Fire Resistance Directory.

IMPORTANT NOTE: Ceiling dampers are for use only in static applications. The airflow ratings of the DFSDR1 damper apply only when used as a Corridor damper.

GENERAL INSTALLATION

1. Ceiling Construction/Penetrations
Corridor – The minimum ceiling partition construction will consist of metal studs on 24" (610) center to center. UL classified 6/s" (16) gypsum will be attached to the studs with 1/16" (25) drywall screws at 12" (305) centers.

Floor-Ceiling/Roof-Ceiling – Ceiling penetrations should be located within ceiling tiles or panels without necessitating cuts in the ceiling suspension main runners or cross tees. If required, a maximum of one runner or cross tee may be cut to enable proper damper location and installation. Each cut end shall be supported by a minimum 12 SWG vertical hangar wire. A 1/2" (13) clearance must be maintained between the air inlet/outlet and the cut end of the runner or cross tee.

2. Diffuser or Grille
The steel diffuser or grille, minimum 24 gage (.6) is supplied by others and is sized to overlap on the bottom edges of the ceiling partition opening a minimum of 1/4" (19) and fit snugly against the ceiling material. The damper must be fastened to the diffuser or grille using No. 8 (M4) screws, 3/16" (5) tubular steel rivets, or 1/4" (6) minimum tack welds spaced 6" (152) O.C. Use a minimum of three screws, rivets or welds equally spaced.

3. Mounting Angles
   (DFSDR1 used as Corridor Damper)
The mounting angles shall be 11/2" x 11/2" x 16 ga. (38 x 38 x 1.6) minimum, 1/16" (29) drywall screws at 12" (305) centers. The steel diffuser or grille, minimum 24 gage (.6) is supplied by others and is sized to overlap on the bottom edges of the ceiling partition opening a minimum of 1/4" (19) and fit snugly against the ceiling material. The damper must be fastened to the diffuser or grille using No. 8 (M4) screws, 3/16" (5) tubular steel rivets, or 1/4" (6) minimum tack welds spaced 6" (152) O.C. Use a minimum of three screws, rivets or welds equally spaced.

4. Damper Sleeves
The 20 gage (.9) sleeve is integral to the damper and shall be equal to or heavier than the gage of the duct connecting as described in NFPA90A and as defined by the appropriate SMACNA duct construction standard.

5. Thermal Insulating Blanket
   (DFSDR1 used as Ceiling Damper)
The thermal insulating blanket (supplied by the factory) must cover all exposed horizontal and vertical back surfaces of the diffuser and fit inside the adjacent tee bars. The thermal blanket is installed by laying it over the exposed surface of the ceiling diffuser. The thermal blanket is retained around the damper or diffuser neck by a 16 SWG minimum steel wire with the wire ends twisted tightly together.

6. Support
Support by the ductwork: Refer to installation figure 1. Two 16 MSG x 11/2" (38) channels support the ductwork adjacent to both sides of the duct drop. The channels are attached to the ceiling structure with minimum 12 SWG vertical (not splayed) wire. The damper and diffuser assembly are fastened to the duct drop using minimum #8 sheet metal screws, 5/16" (4.5) tubular steel rivets or 1/4" (6) tack welds at 6" (152) o.c.

7. Duct Connections
Round break-away connections must consist of a steel clamp, 16 gage (.6) steel wire or 3 - #10 sheet metal screws spaced equally around the circumference of the duct. If flex duct is used the connections shall be a steel clamp, plastic strap or minimum 18 gage steel wire.

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

Hardcast Inc. – Iron Grip 601
Precision – PA2084T
Eco Duct Seal 44-52
Design Polymerics – DP 1010

8. Actuator Connection
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

9. Installation and Maintenance
To ensure optimum operation and performance, the damper must be installed so it is round and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or actuators. Each fire/smoke damper should be examined on a regular basis to ensure it is not rusted or blocked. It is recommended the damper be operated (the actuator cycled) at least once every 6 months. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

Dimensions shown in parentheses ( ) indicate millimeters.

INSTALLATION SUPPLEMENTS
Refer to the appropriate Ruskin installation instruction supplements for special requirements.

- Motor Operated TS150 FireState System with High Limit Temperature Sensor
- Motor Operated EFL Electric Resettable Link
- PFL Pneumatic Fuse Link
- SP100 on Fire and Leakage Rated Dampers
**STEEL STUD CONSTRUCTION**

- Cut stl. runner web & secure to stl. stud w/2 sheet mtl. screws (Typ.)
- 5/8" (16) UL Classified drywall
- 24" (610) max. C-C
- 12" (305) c-c

**ITEM**

1. Actuator (location may vary)
2. Flex Conduit
3. TS150 FireStat, EFL (electric fuse link) or PFL (pneumatic fuse link) (location may vary)
4. Integral Sleeve Damper Frame
5. Steel Surface Mount Ceiling Diffuser (supplied by others)
6. Mounting Angles and Fasteners
7. Duct (Flexible or Hard)

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**FLOOR-CEILING /ROOF-CEILING INSTALLATION**

**ITEM DESCRIPTION**

1. Integral Sleeve Damper Frame
2. Surface Mount or Lay-In Ceiling Diffuser
3. Duct (Flexible or Hard)
5. 12 Gage Steel Wire
6. 16 MSG x 1 1/2" Channel
7. Thermal Blanket Insulation