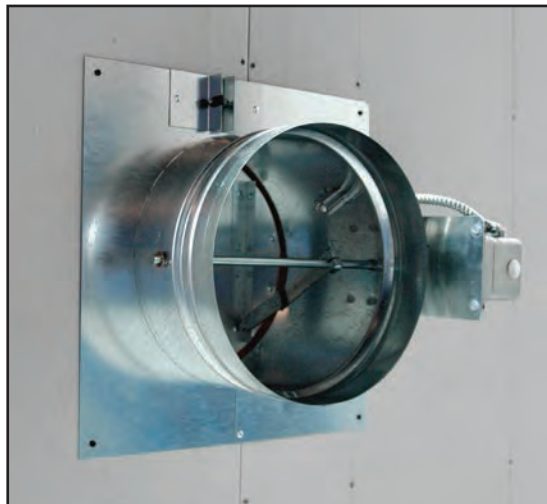


RUSKIN[®]

Life Safety Solutions

Specification and Installation Instruction Manual



**Combination Fire and Smoke Dampers, Smoke Dampers,
Curtain and Multiple Blade Fire Dampers
and Ceiling Fire Dampers**

Fire/Smoke Catalog Index

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

Product Data

Description

FSDOM-514	Operation & Maintenance Instructions
Report #1113	Testing and Maintenance of Life Safety Dampers
Report #114	Dynamic Fire Damper Testing and Maintenance
ERTRFSD-102	Advantages of True Round Fire/Smoke Dampers
Report #8190:1	Airfoil Blade Design Advantages
Report #398	Combination Fire/Smoke Damper Release Devices

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-514	Damper Test Switch for Smoke Dampers
MCP3/34-1215	Single Damper Control Panel “Lights Only”
MCP4/44-1215	Single Damper Control Panel “lights and Test Switch”
MCPB/1.5-1215	Single Damper Control Panel “On/Off or Test Switch” No lights
MCP1/14-1215	Single Damper Control Panel “For use with TS-150 Fire Stat”
MCP10/20-305	Multiple Damper Control Panel “For use with TS-150 Fire Stat”

Product Data

Description

Installation

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 I or II leakage	II-FSDLP-514
FSDR60, FSDR25(SS) FSD60, FSD60-2 FSD60V FSD60M FSD60-XP	True Round Ultra-Low Leakage Class I, 1 ½ hour Rated FSD60 Series High Performance Class I, II and III, 1 ½ hour Rated	II-FSDR60-316 II-FSD60-514
FSD35, 36 and 37 FSD60-3 and -3M FSD35SS, 36SS, 37SS	FSD35 Series Class I, II and III, 1 ½ hour Rated FSD60-3 Series High Performance Class I and II, 3 hour Rated Stainless Steel Series Class I, II and III, 1 ½ hour Rated	II-FSD36-514 II-FSD60-3-316 II-FSDSS-514

GRILLE or SHAFT COMBINATION FIRE/SMOKE DAMPERS

FSD60FA and FSD36FA	Front Access FSD, Class I and II, 1 ½ hour Rated Actuator Replacement and Wiring Accessibility for FSD36FA and FSD60FA	II-FSDFA-514 II-FSDFA-209 Supplement
FSDxxGA FSDxxOW FSD60C and FSD36C FSDR60C DFSDR1	FSD “Grille Access”, Class I and II, 1 ½ hour Rated FSD “Out of Wall”, Class I and II, 1 ½ hour Rated “Tunnel Corridor” Fire Smoke Damper, Class I and II, 1 hour Rated True Round “Tunnel Corridor” Fire Smoke Damper 1 hour Rated Round Tunnel Corridor / Ceiling Fire Damper	II-FSDGA-514 II-FSDOW-514 II-FSD60/36C-114 II-FSDR60C-814 II-DFSDR1-514

SMOKE DAMPERS

[Smoke Damper Selection and Application Guide](#)

SDRS25 (SS) SD50 SD60 and SD60-2 SD60V SD35, 36 and 37 SD35SS, 36SS and 37SS SD60M SD120	True Round Class I Leakage Rated Smoke Damper Aluminum Air Foil Blade Class I Leakage Rated Smoke Damper Galvanized Air Foil Blade Class I and II Leakage Smoke Damper Galvanized Vertical Air Foil Blade Class II Leakage Smoke Damper Galvanized V-Grove Blade Class I, II & III Leakage Smoke Damper Stainless Steel V-Grove Blade Class I, II & III Leakage Smoke Damper Modulating Air Foil Blade Class I Leakage Smoke Damper Heavy Duty Smoke Damper	II-SD-316 II-SD102-514
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Product Data	Description	Installation
CURTAIN & MULTIPLE BLADE FIRE DAMPERS		
<i>Static/Dynamic Fire Damper Selection Application Guide</i>		
FDR25 and FDR25SS	True Round 1 ½ Hour Fire Damper	II-FDR25-514
DFD-LP	Low Profile; Low Pressure, Drop Dynamic 1 ½ Hour Fire Damper	II-DFD-LP-114
DIBD2 and DIBD2SS		
IBD2 and IBD2SS	Standard Curtain Fire Dampers 1½ Hour Rated	II-IBD-514
IBDT, T1 and T2		
DIBD20, 40 and 60	Integral Sleeve/Frame Curtain Fire Dampers 1½ Hour Rated	II-IBD20-514
IBD20, 40 and 60		
DIBD23 and DIBD23SS	Standard Curtain Fire Dampers 3 Hour Rated	II-IBD23-514
IBD23 and IBD23SS		
DIBD230, 430 & 630	Integral Sleeve/Frame Curtain Fire Dampers 3 Hour Rated	II-IBD230-514
IBD230, 430 and 630		
DFD60		
DFD35	Multiple Blade Fire Dampers 3 Hour Rated	II-FD60-514
FD60		
FD35		
(D)FD35SS	Stainless Steel Multiple Blade Fire Dampers 1½ Hour Rated	II-FD35SS-514
DFD60-3		
FD60-3	Multiple Blade Fire Dampers 3 Hour Rated	II-FD60-3-514
DIBD2(SS)-CUL		
IBD2(SS)-CUL	Standard Curtain Fire Dampers 1½ Hour Rated (Canada)	II-IBD-CUL-714
IBDT, T1 and T2-CUL		
DIBD20, 40 & 60-CUL		
IBD20, 40 & 60-CUL	Integral Sleeve/Frame Curtain Fire Dampers 1½ Hour Rated (Canada)	II-IBD20-CUL-714
DIBD23(SS)-CUL		
IBD23(SS)-CUL	Standard Curtain Fire Dampers 3 Hour Rated (Canada)	II-IBD23-CUL-714
DIBD230, 430 & 630-CUL		
IBD230, 430 & 630-CUL	Integral Sleeve/Frame Curtain Fire Dampers 3 Hour Rated (Canada)	II-IBD230-CUL-714
GRILLE and SHAFT FIRE DAMPERS		
(D)IBD2(SS)GA	“Grille Access” Curtain Fire Damper 1½ Hour Rated	II-(D)IBD2GA-514
(D)FD60GA		
(D)FD35(SS)GA	“Grille Access” Multiple Blade Fire Damper 1½ Hour Rated	II-FD35/60GA-514
(D)IBD2(SS)OW	“Out of Wall” Curtain Fire Damper 1½ Hour Rated	II-(D)IBD2OW-514
(D)FD60-OW		
(D)FD35(SS)-OW	“Out of Wall” Multiple Blade Fire Damper 1½ Hour Rated	II-FD35/60OW-514
(D)IBD2G, 20G	Grille Mounting Curtain Fire Damper 1½ Hour Rated	II-(D)IBD2G-714

INSTALLATION INSTRUCTION SUPPLEMENTS

Product Data	Description
INSTALLATION VIDEOS	
	Wood Stud Framing Basic Instructions
	Metal Stud Framing Basic Instructions
	FAST Angle - Wood Stud Installation
	FAST Angle - Metal Stud Installation, Before Drywall
	FAST Angle - Metal Stud Installation, After Drywall
	FAST Angle - Concrete/Masonry Installation
FRAMING DETAILS	
	Recommended Framing in wood or metal stud walls
II-U438-514	Cavity Shaft Wall Metal Stud Framing Details
II-CSWC-514	Metal Stud Framing in Tunnel Corridor Shaft-Wall Ceiling Detail
II-MFD-514	Mullions for Dampers in Oversized Wall Openings Detail
DUCT CONNECTION	
II-FSBC-115	Flange System Breakaway Connections (Duct Mate, TDF, TDC and Ward)
II-TDFADD-514	TDF and TDC Field Add-On Flange Connections
EXTEND and TRIM DAMPER SLEEVE	
II-EDS-514	Extension of Fire and Combination Fire and Smoke Damper Sleeves
II-FSDTrim-4	Trimming of Fire & Combination F/S Damper Sleeves
II-3-Sided-Angle	Optional 3-Side Retaining Angle
SEALANTS and FIRE STOP MATERIAL	
II-FIRESTOP-814	Optional Firestop Installation
II-SEAL-814	Optional Sealant Installation Instructions
GRILLE and TRANSFER OPENINGS	
II-TRANS-514	Transfer Openings for Duct Terminators Installation Instructions
II-G-Angle-514	(D)IBD, FD and FSD Grille Mounting Angles Installation Instructions
II-DECK-1104	Concrete Floor with Steel Deck Installation Instructions

Product Data	Description
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SMACNA INSTALLATION INSTRUCTION RECOMMENDATIONS

5.4	Minimum Sleeve Thickness
5.9	Out of Wall Fire Damper Installation
5.10	Out of Wall Fire Smoke Damper Installation
5.12	Duct Liner Interruption
5.13	Duct Insulation
6.4	Multiple Penetrations
6.5	Diagonal Penetration

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
SP200-514	SP200 Switch Package for Curtain Fire Damper
II-PFL-514	Pneumatic Fuse Link "PFL"
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

Product Data	Description	Installation
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CEILING RADIATION DAMPERS

	<i>Ceiling Radiation Damper For Wood Construction</i>	
CFD2, 3, 3.5 and 4	CFD2, CFD3, CFD3.5 and CFD4 Standard Ceiling Fire Dampers	II-CFD-1008
CFD5	Ceiling Fire Damper for Lay-In ceilings	II-CFD(R)5-1008
CFD8	Low Profile Ceiling Fire Damper	II-CFD8-1008
CFD7T	Ceiling Fire Damper for Open Web Wood Truss Assemblies	II-CFDWT-614
CFD7	Ceiling Fire Damper for Wood Joist Assemblies	II-CFD7-316
CFDR7T	True Round Ceiling Fire Damper for Open Web Wood Truss Assemblies	II-CFDR7-T-614
	Fiberglass Duct Board Plenum for Ceiling Dampers Installation Supplement	II-Ductboard-507
	CFD7 Installation Supplement for Ceiling Design G548	II-CFD7 Supp-1004
	CFD7 Installation Supplement for Ceiling Design L524	II-CFD7 SuppL524-1004
CFD2W, 3W, 4W	Warnock Hersey Classified Ceiling Radiation Damper	II-CFDW-1103
DFSDR1	Motorized Ceiling Fire Damper	II-DFSDR1-514

RUSKIN ***LABOR*** ***SAVERS***

*Fire, Smoke
& Combination
Fire/Smoke
Dampers*



The contractor guide to save time and money

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Save Time Save Money Save Now!

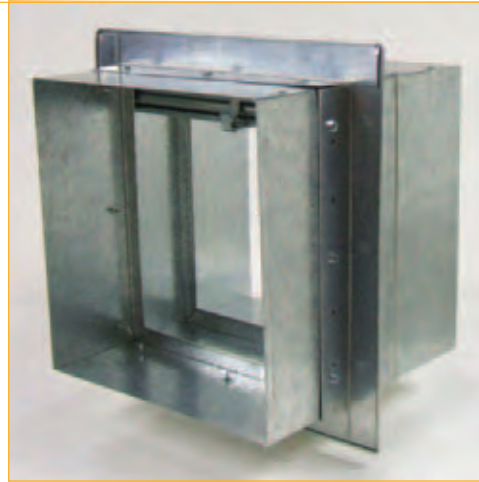
Ruskin Labor Savers are UL approved products and installation methods for fire, smoke and combination fire/smoke dampers that save contractors money.

Labor Savers can be ordered in three different categories:

- Installation Aids
- Application Solutions
- Installation Options
- **Labor Savers – Installation Aids**
Supplied with each damper to reduce the handling time at the job site.
- **Labor Savers – Application Solutions**
Dampers that have been specifically engineered for unique applications.
- **Labor Savers – Installation Options**
Specialized UL approved installation methods that go beyond standard installations.

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.

#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

#3 LABOR SAVER



FACTORY ASSEMBLED INTEGRAL SLEEVE

- Fewer pieces to handle with multiple sections
- Angle option around entire perimeter
- Assembled for larger openings

#4 LABOR SAVER



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

#5 LABOR SAVER



Damper shown with factory mounted TDF Flange

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

#6 LABOR SAVER



S-AND-DRIVEMATE BREAKAWAY CONNECTIONS

- Ruskin's Drivemate #14880
- Factory hemmed sleeves complement drive mate
- Easy to use, worry free connections that stay joined

#7 LABOR SAVER



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

#8 LABOR SAVER



INSTALLATION AND AIRFLOW IN ANY DIRECTION

- Combination fire/smoke, and smoke damper flexibility
- Bi-directional airflow
- Ability to rotate dampers for actuator access

Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

APPLICATION SOLUTIONS

#9 LABOR SAVER



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

#10 LABOR SAVER



FRONT ACCESS COMBINATION FIRE/SMOKE 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

Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

#11 LABOR SAVER



DAMPERS FOR GRILLE INSTALLATIONS

- Opening size up to 90" x 48"
- Metal or aluminum grilles or louvers
- Transfer openings installation
- Angle one side installation

#12 LABOR SAVER



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

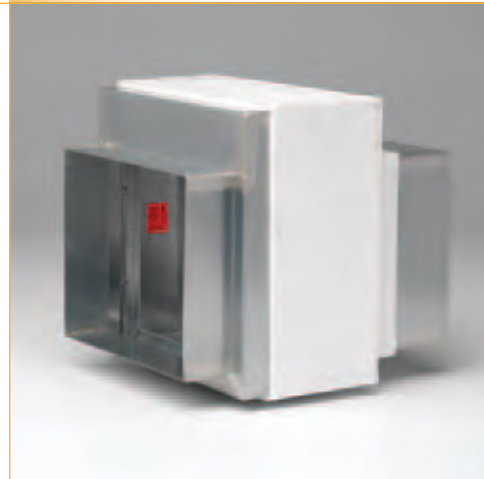
#13 LABOR SAVER



GRILLE ACCESS DAMPERS

- Permits access to the actuator through grille
- Installs completely from one side of wall
- Does not require retaining angles

#14 LABOR SAVER



OUT OF WALL DAMPERS

- 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

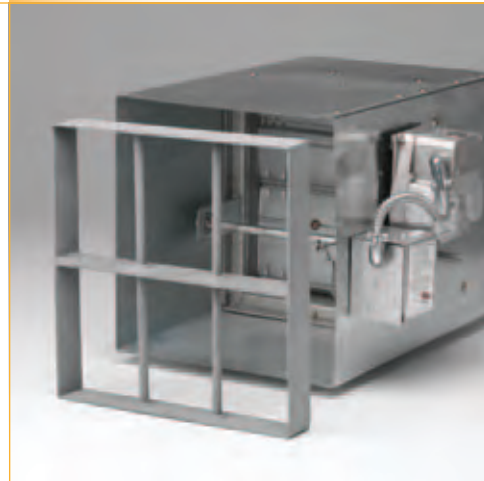
#15 **LABOR SAVER**



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 1/2", 3/4" and 1" diameter bars
- Factory installed

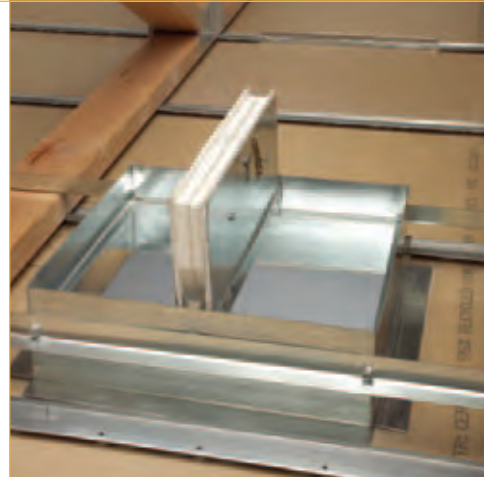
#17 **LABOR SAVER**



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 though 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 except grilles with up to 2 1/2" grille depths
- Through ceiling membrane penetration

INSTALLATION OPTIONS

#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 — DP1010 Water Base
 - Eco-Duct Seal — 44-52

#22 LABOR SAVER



FIELD SLEEVE EXTENSIONS

- Same gauge as factory sleeve
- Field caulked with UL listed materials

RUSKIN[®]
Air & Sound Control
 Specified by Many – Equaled by None

ISO9001
 CERTIFIED

RUSKIN.com



OPERATION & MAINTENANCE INSTRUCTIONS

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 the actuator 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 the actuator 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 authorities having jurisdiction 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 fire 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.

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.

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.



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ENGINEERING REPORT

TOPIC: TESTING and MAINTENANCE of LIFE SAFETY DAMPERS

Report No. 1113

November 2013

By Kent Maune

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.

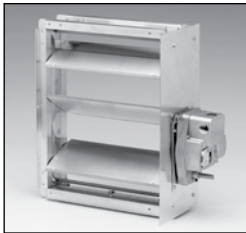
Damper Types



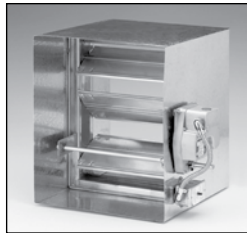
Curtain Fire Damper (D)IBD



Multiple Blade Fire Damper (D)FD



Smoke Damper (SD)



Combination Fire Smoke Damper (FSD)

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

Ceiling Fire (Radiation) Damper: Install in accordance with the manufacturer's installation instructions in fire resis-tance-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 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 shall 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.

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

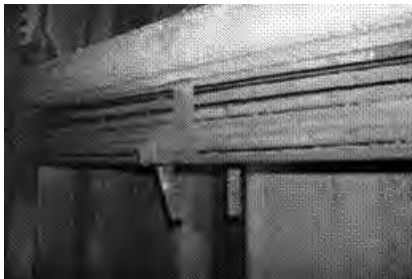
Smoke dampers and most combination fire/smoke dampers do not use fusible links to operate. These dampers use an electric or pneumatic actuator to operate the damper. A bi-metallic disc type thermostat is used to interrupt electrical power or air pressure to the actuator at a specified temperature. Once 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 dampers should be tested per NFPA standards to avoid non-functional situations as shown.

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 for 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.

The second describes the procedure for dampers designed with position indication switches. The blade positioning switches verify that the damper has reached the fully-opened and fully-closed positions. These switches can be wired to local or remote control panels (MCP), dedicated testing and maintenance systems, like the Ruskin Inspector™, or a typical building automation system (BAS).

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 actuator 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 the 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.

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 PC.



- Satisfies NFPA requirements* for both initial and periodic testing of life safety dampers
- RFDI – Radio Frequency Damper Interface displays damper address on LCD screen
- RFSC – Radio Frequency Smart Communicator can control dampers up to 90 feet away and includes microprocessor that stores all test results for future reference
- Wireless communication protocol by EnOcean®



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.

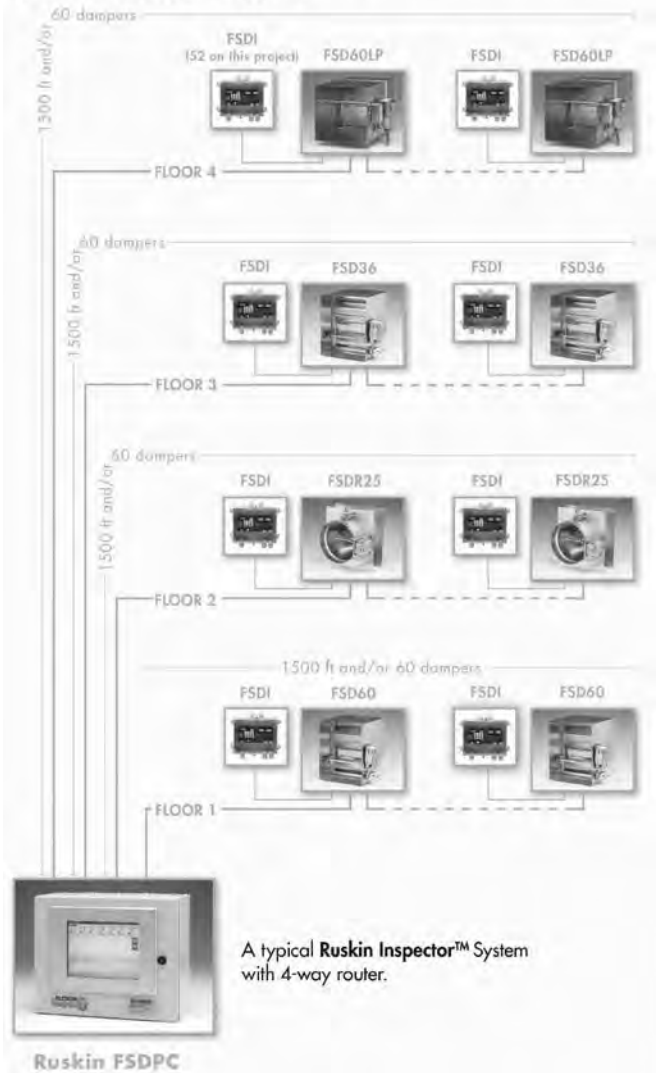
Fire/Smoke Damper Interface (FSDI) - FSDI provides the necessary interface to allow communications between the damper and the Ruskin Inspector™ FSDPC. Any life safety damper equipped with the FSDI is Ruskin Inspector™ ready. Up to 500 devices may be installed on a single panel.



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).



CONTINUOUS 24/7/365 DAMPER MONITORING WIRED INSPECTOR™ SYSTEM



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

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ENGINEERING REPORT

TOPIC: Dynamic Fire Damper Testing and Maintenance

Report No. 114

JANUARY 2014

By Kent Maune

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).

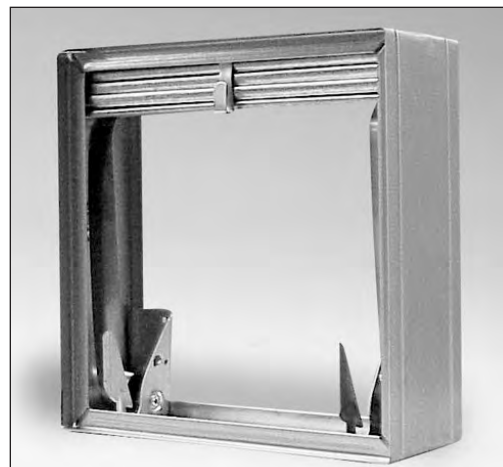
Limited access and closure springs on dynamic curtain blade fire dampers and floor mounted static curtain blade fire dampers do not make testing and maintenance friendly. However, they are life and property friendly because they will close when properly applied and installed.

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

A solution to the maintenance testing is not so simple.



Typical Curtain Blade Static Fire Damper



Typical Curtain Blade Dynamic Fire Damper

Maintenance should be performed 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 its 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.



**Typical Motorized
Fire Damper**



**Typical Multiple Blade
Fire Damper**



**Typical Round
Fire Damper**

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ENGINEERING REPORT

TOPIC: Advantages of True Round Fire/Smoke Dampers

By Richard Cravy

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.

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**

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

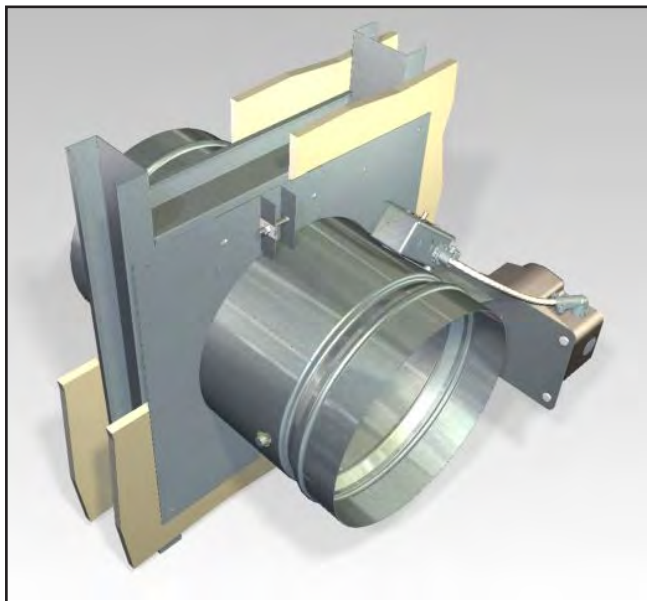


FIGURE 1

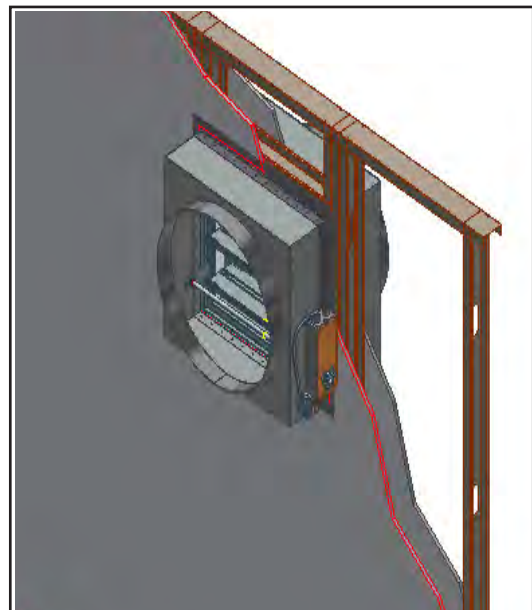


FIGURE 2

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 per-

formance 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



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ENGINEERING REPORT

TOPIC: Airfoil Blade Design Advantages

Report No. 8190:1

By: Robert Van Becelaere

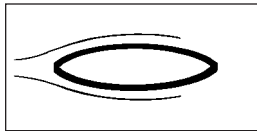
There are several pieces of information out there stating airfoil blades on dampers are unnecessary. To help your engineers make up their own minds as to the correct blade to specify, here are five reasons to specify an airfoil blade over a triple-V-groove or modified flat blade:

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

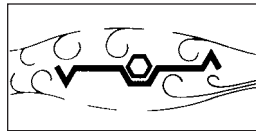
Now, let's look at these five reasons in detail.

1. BLADE STRENGTH

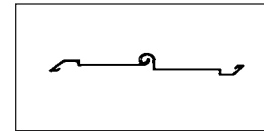
The strength of a blade comes primarily from its shape. There are three basic blade shapes available in the market:



AIRFOIL



TRIPLE-V-GROOVE



MODIFIED SINGLE SKIN
(Prefco)

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.

MAXIMUM INSTANTANEOUS STATIC PRESSURE*

Blade Length	Maximum Instantaneous Static Pressure – in. w.g.*		
	60 Blade Airfoil	35 Blade Triple-V-Groove 16 gauge	Modified Single Skin Prefco 20 gauge
36"	17	8.5	2.1
32"	25	12.5	2.9
30"	30	15.0	3.6

*Instantaneous static pressures shown are not normal operational design static pressures, but sudden and momentary static pressures that may be encountered.

Your engineer may say he doesn't need the high static pressure design. But if the dampers are designed to close rapidly – such as 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.

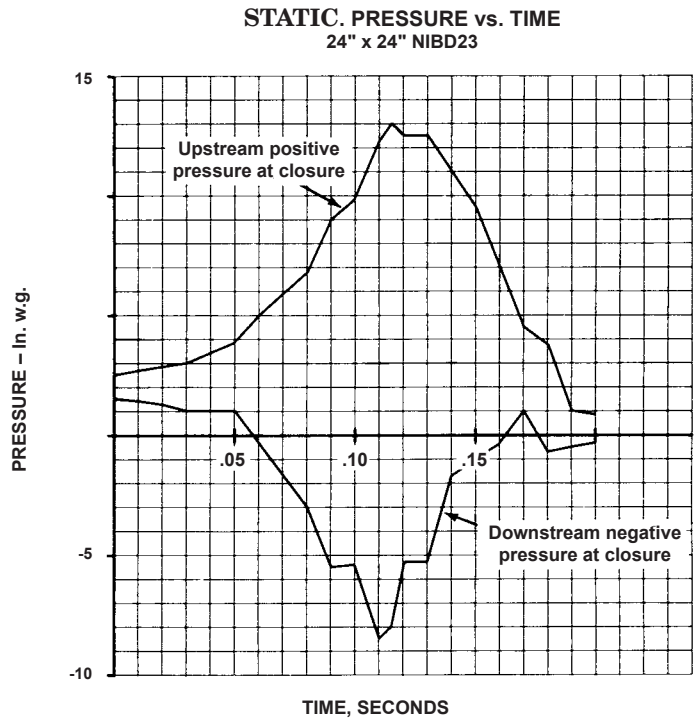


FIGURE 1.1



FIGURE 1.2

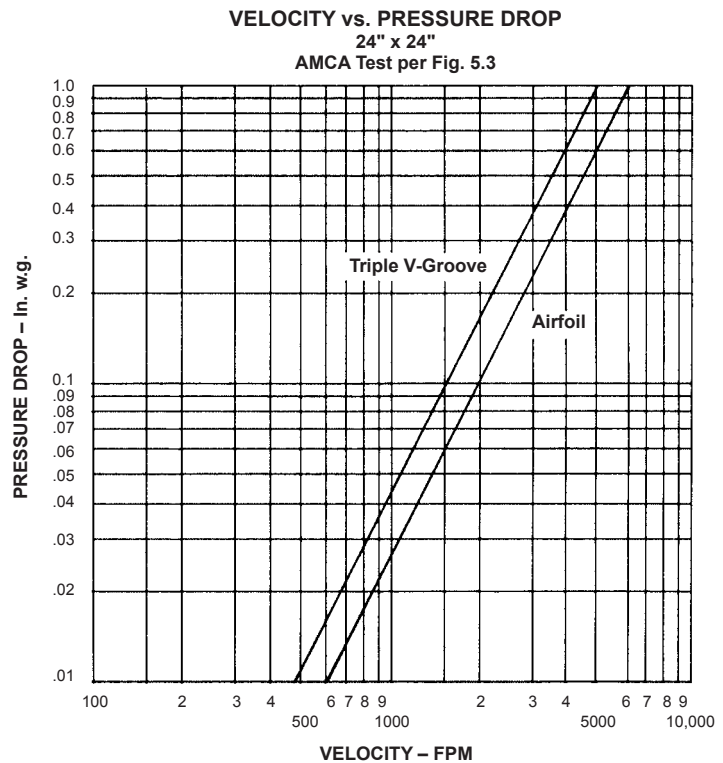
The negative static pressure can build as depicted in Figure 1.3, which is based on 4000 fpm duct velocity and only 21' downstream ductwork. As you can see, blade design is important in handling the static pressure that can build in your everyday HVAC system.



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

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.

NOISE CRITERIA

Velocity	Airfoil	Triple-V-Groove	Prefco Single Skin
1000 FPM	19 NC	30 NC	29 NC
2000 FPM	35 NC	46 NC	46 NC
3000 FPM	45 NC	55 NC	58 NC
4000 FPM	51 NC	60 NC	63 NC

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.

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ENGINEERING REPORT

TOPIC: Combination Fire/Smoke Damper Release Devices

Report No. 398

MAY 1998

By Richard Cravy

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.



EFL Quick Detect/Controlled Closure Device

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



Easy Reset

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.

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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'

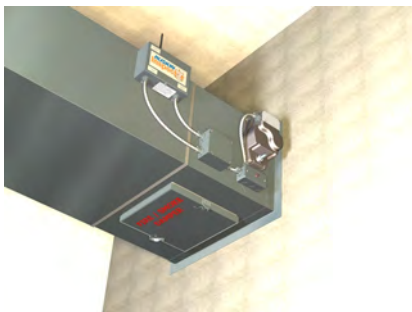
Master Control Panel (Lights Only) 'MCP3'

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

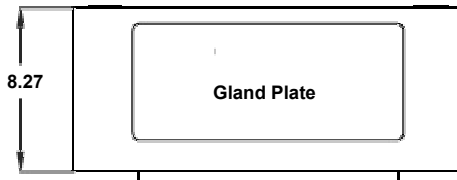
APPLICATION

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

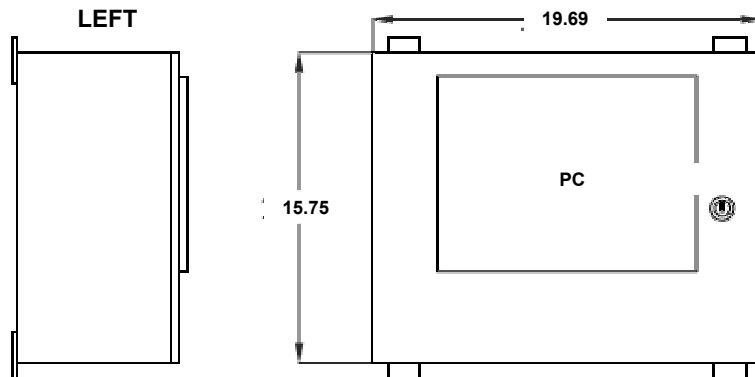


PANEL SPECIFICATION	
SIZES (H x W x D)	15.75 X 19.69 X 8.27 (Image Shown)
COLOR	RAL 7035 (off-white)
HINGED	LEFT
POWER CABLE	TOP RIGHT HAND SIDE
I/O CABLE	TOP ENTRY
INTERNAL PC CABLE	CAT 5e CROSSOVER
FIELD NETWORK CABLE	See page 2
MAX ROOM AMBIENT TEMPERATURE	100°F

TOP



FRONT



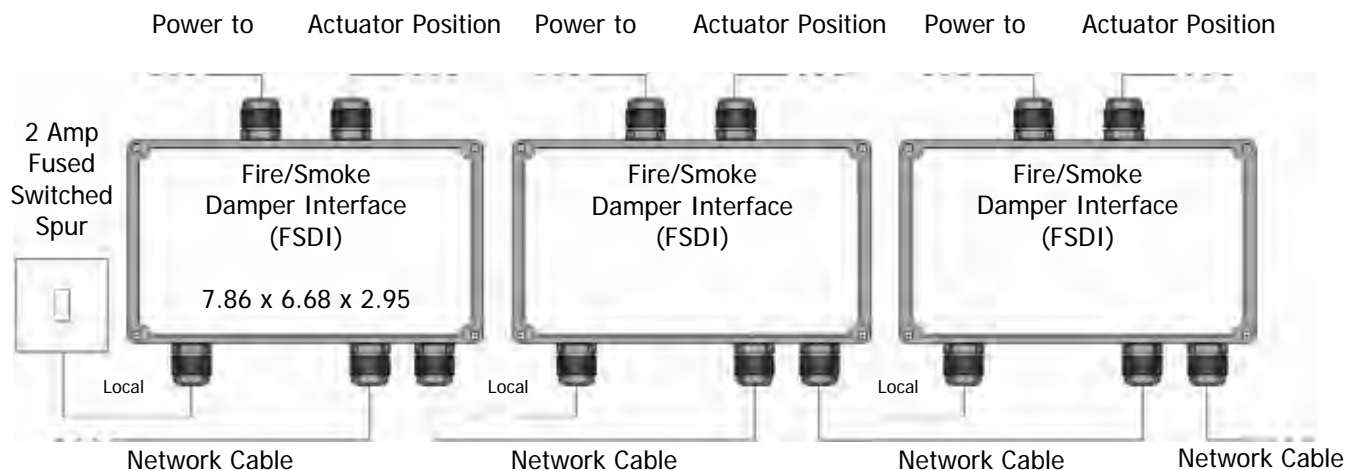
PANEL FEATURES

- 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)

TYPICAL NET WORK WIRING DETAILS



STANDARD NETWORK SPECIFICATION & RULES

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 CABLE SPECIFICATION

Ruskin recommends the following network cable for use with the Inspector™ network. Consult with Ruskin before using any other cable to ensure it will be compatible.

1 pair 22AWG Stranded Unshielded Level 4 Plenum Echelon/Lonworks Blue Jacket type CMP/CSA 6ft
(MADE IN THE USA)



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.

CONTRACTOR'S INSTALLATION / COMMISSIONING GUIDE

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.

COMMISSIONING

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.

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 and 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



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WIRELESS DAMPER INSPECTOR

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 2 1/2" (127 x 178 x 63)
18 gauge (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

NOTES:

1. Dimensions shown in parenthesis () indicate metric units.
2. Refer to Installation Instructions for additional details.
3. Every system requires the purchase of (minimum of one) RFSC.



RFSC hand held Radio Frequency Smart Communicator

RFDI Radio Frequency Damper Interface



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

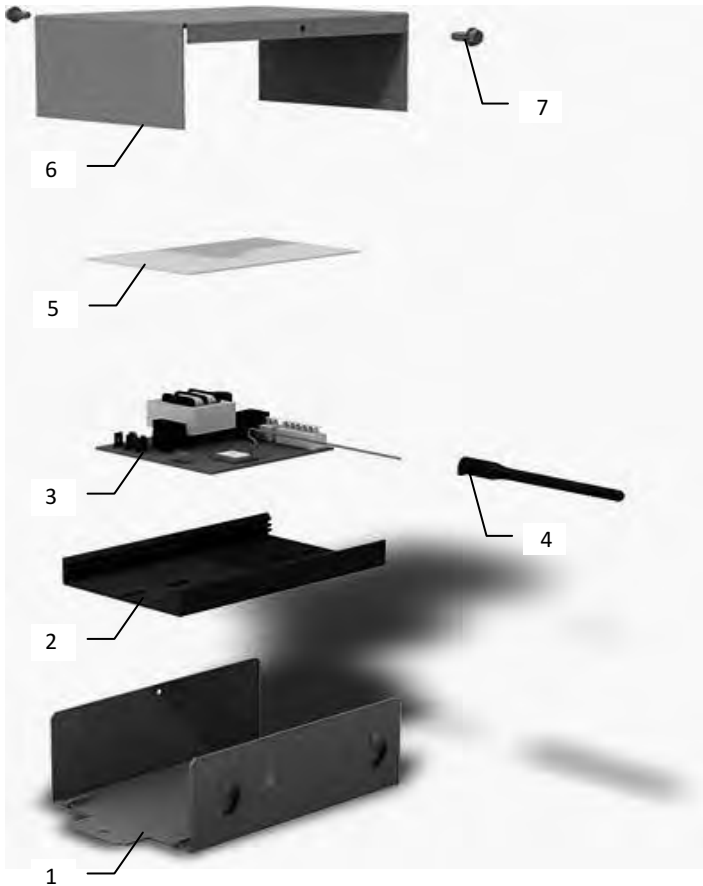
VARIATIONS

Ruskin model RFDI is available with the following variations at additional cost.

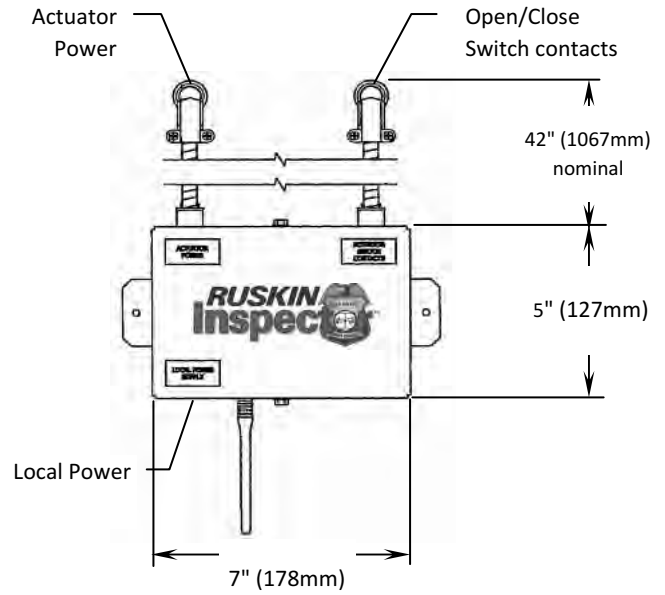
- Factory programming of RFSC (damper tag/ID)
- 868.3Mhz radio frequency (Europe and Asia)

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.

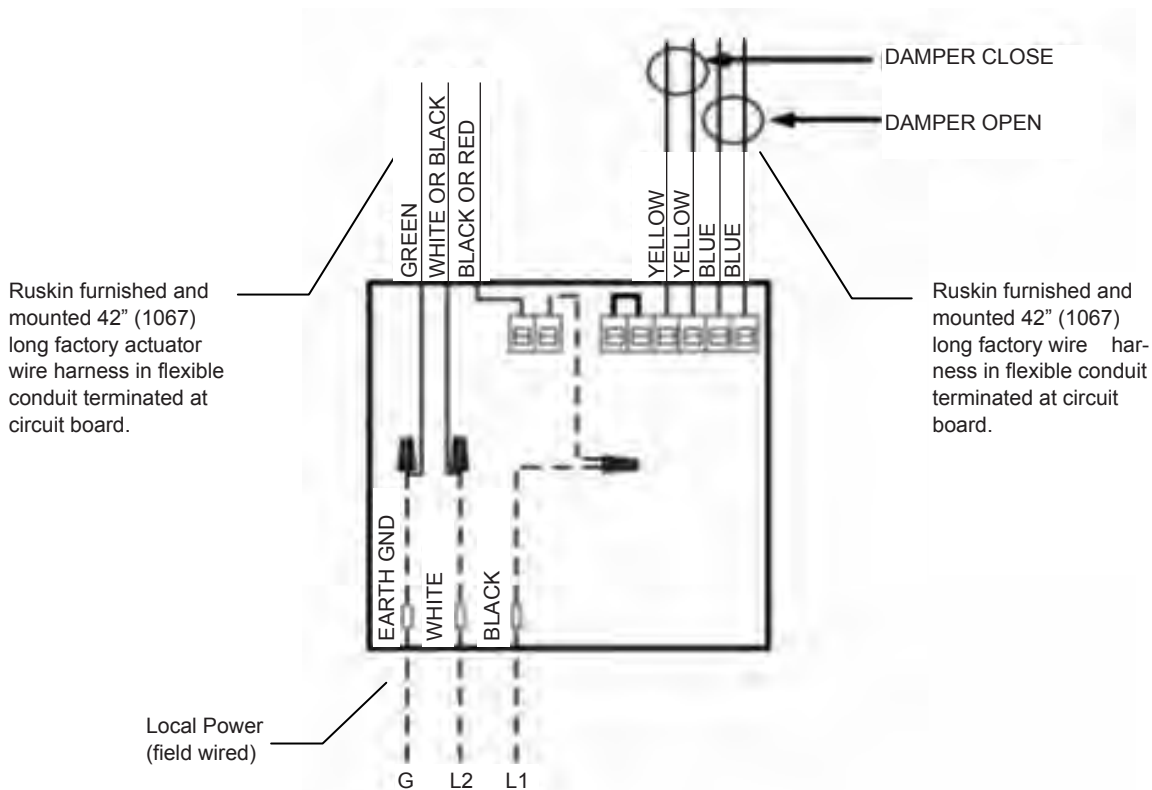
RFDI DIMENSIONAL DETAILS



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 ELECTRICAL DATA



HOW IT WORKS

Any actuated life safety damper with factory supplied damper switch packages or actuators with switches can be remotely cycled from up to 90 feet away when equipped with a Ruskin Wireless Damper Inspector™. The Ruskin Wireless Damper Inspector™ consists of a Radio Frequency Damper Interface (RFDI) and a Radio Frequency Smart communicator (RFSC). An RFDI is installed at each damper location. The circuit is encoded with a unique address that identifies the damper.

While walking through the structure, the RFSC smart communicator pings all RFDI's within range. A list of dampers, identified by tag and location, are displayed on the RFSC screen. The user can scroll up and down through the list of dampers. Each damper can be tested from this menu. After all the dampers have been tested, the user can walk to the next location and repeat the steps.

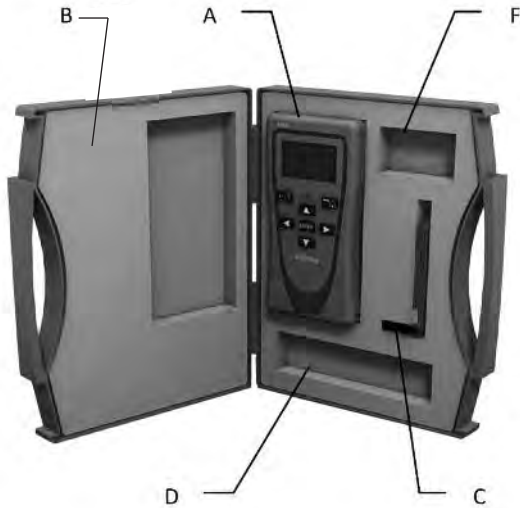
All test data are stored in the RFSC until uploaded into any personal computer. The RFSC comes with necessary USB cable and software. Ruskin Wireless Damper Inspector™ is the perfect solution for those few hard to reach or inaccessible dampers found at every job site.

- Damper tags can be field modified using the RFSC.
- Dampers can be added in the field using the RFSC and furnished software.



RFSC hand held radio frequency smart communicator

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

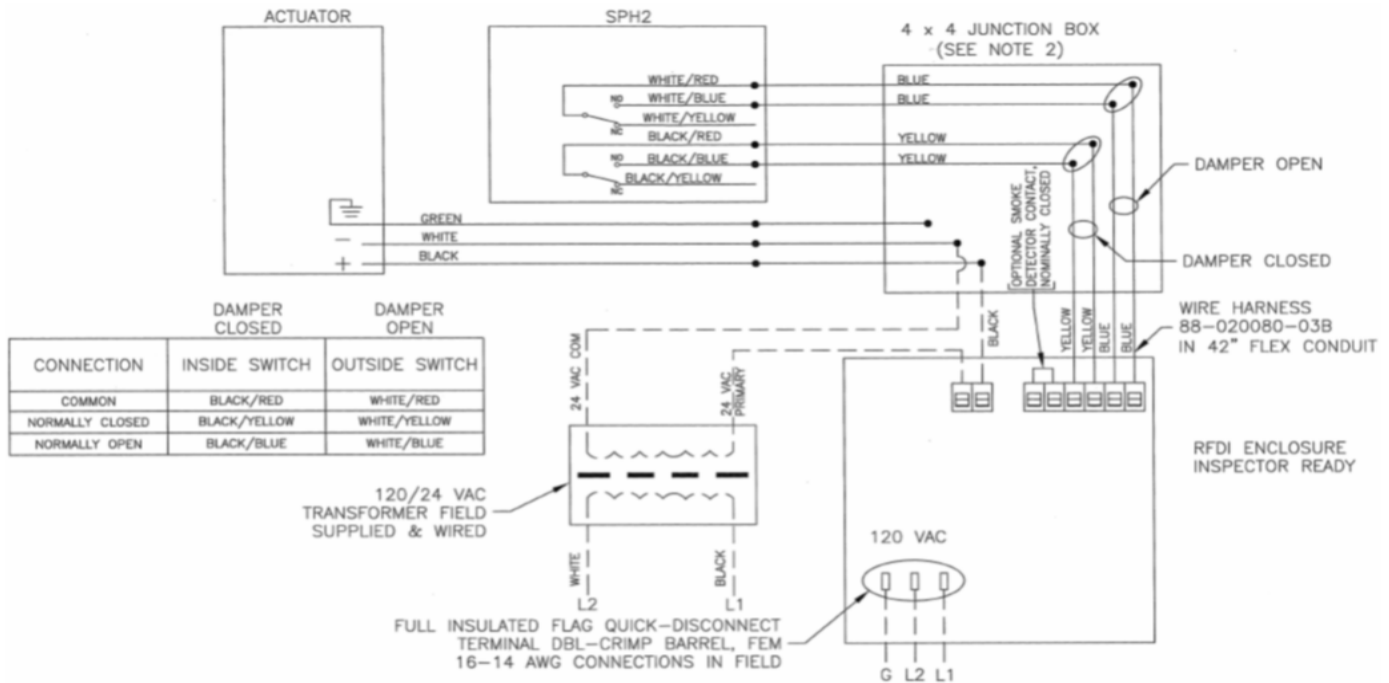


Ruskin model **RFSC** – Radio Frequency Smart Communicator – is designed to work exclusively with the Ruskin **RFDI** – Radio Frequency Damper Interface. The hand-held **RFSC** is equipped with EnOcean® open protocol software, permitting the building maintenance personnel to scan each onboard transceiver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

TYPICAL SCHEMATIC FOR DAMPER WITH 24V ACTUATOR, RFD1 & FACTORY SWITCH PACKAGE



NOTES:

1. - - - - - denotes field wired.
2. RFD1 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 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™.

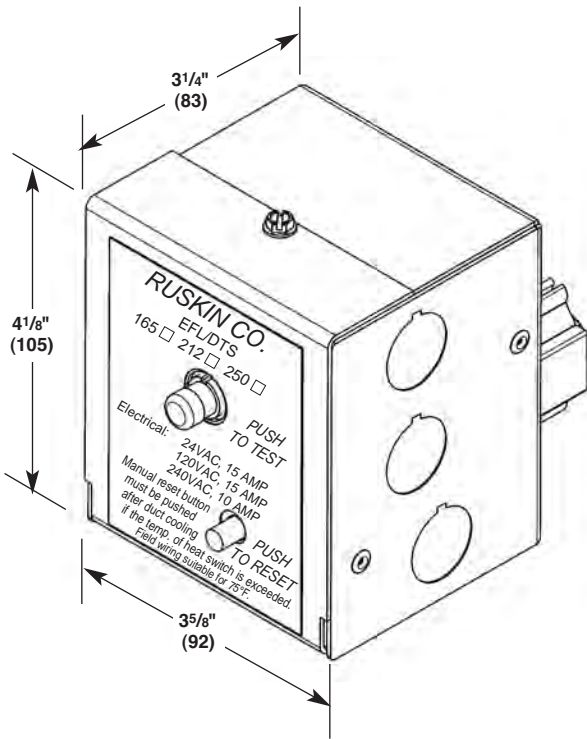


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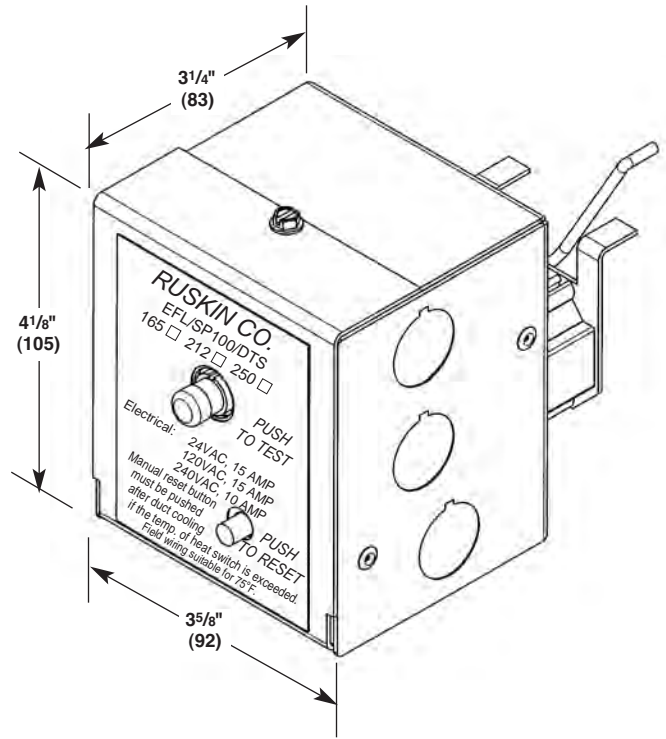
DTS – DAMPER TEST SWITCH OPERATION INSTRUCTION SUPPLEMENT

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.

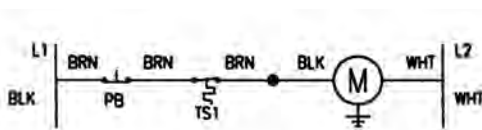


DTS/EFL

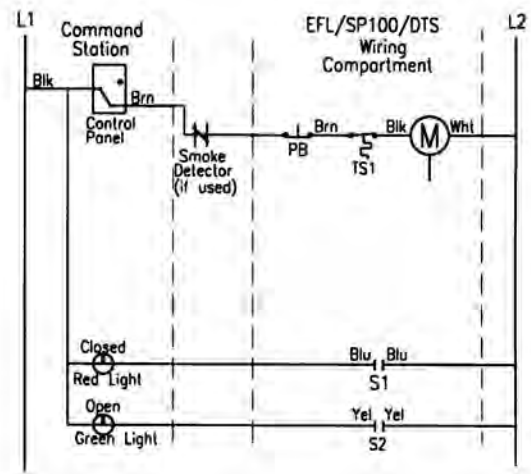


DTS/EFL/SP100

WIRING DIAGRAMS



DTS/EFL



DTS/EFL/SP100

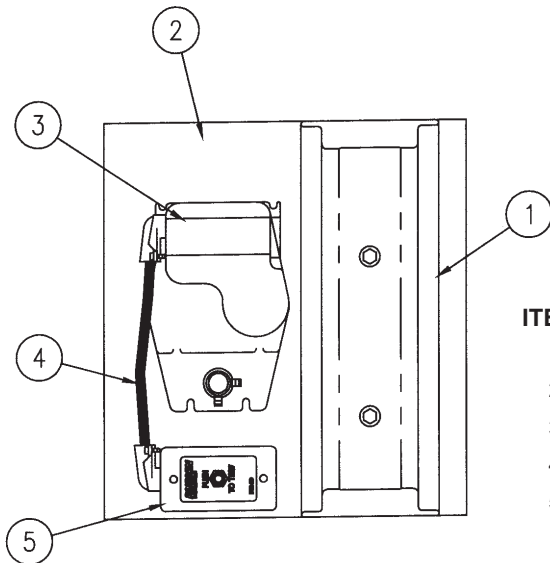
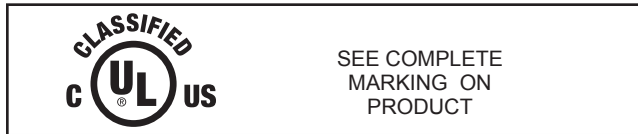


NOTE: Dimensions shown in parentheses () indicate millimeters.

OPERATION INSTRUCTION SUPPLEMENT DTS-SD DAMPER TEST SWITCH FOR SMOKE DAMPERS

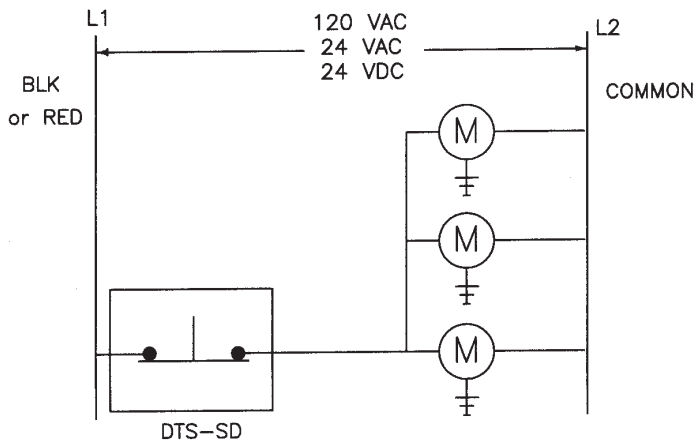
APPLICATION

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.



ITEM	DESCRIPTION
1.	Smoke Damper
2.	Side Plate or Sleeve
3.	Actuator
4.	Conduit
5.	DTS-SD

WIRING DIAGRAM



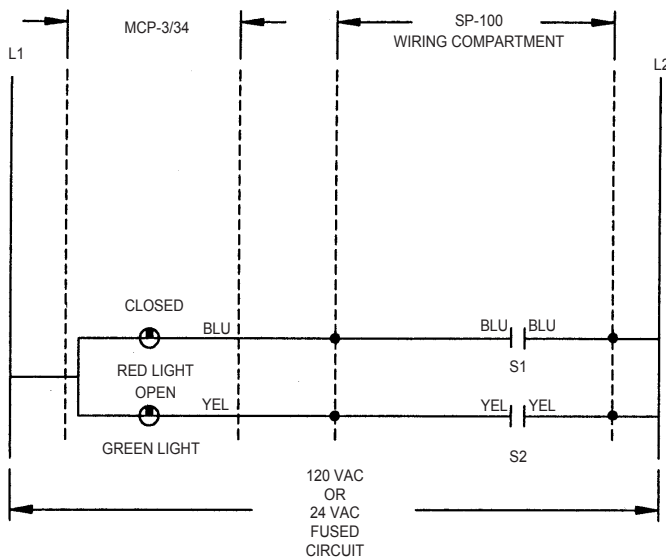
Pneumatic actuators to be piped per local codes.
Electric actuators to be wired per the National Electric Code (NEC) and local codes. See actuator for wiring diagrams.

MCP3 AND MCP34 "LIGHTS ONLY" CONTROL PANEL

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 red light for closed damper and a 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.



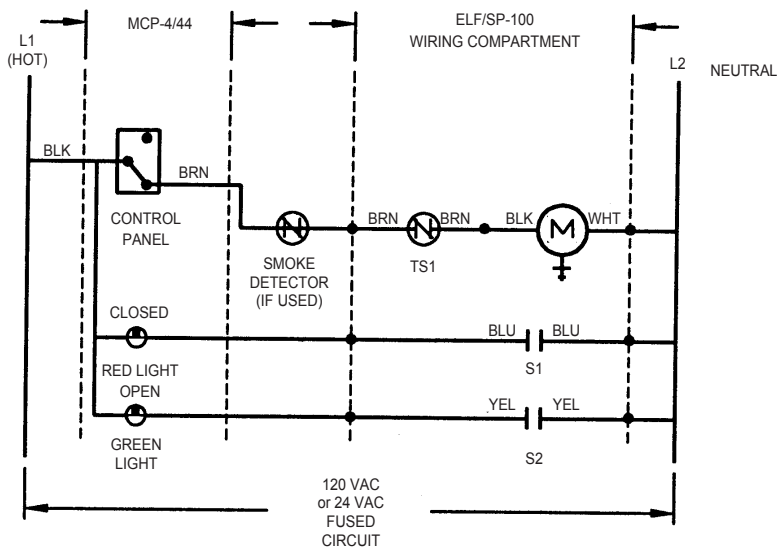
MCP3/34

MCP4 AND MCP44 CONTROL PANELS

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 red light for closed damper and a 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.



MCP4/44

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.



MCPB



MCP1.5

MCP1, MCP14, MCP2 AND MCP24 CONTROL PANELS

APPLICATION

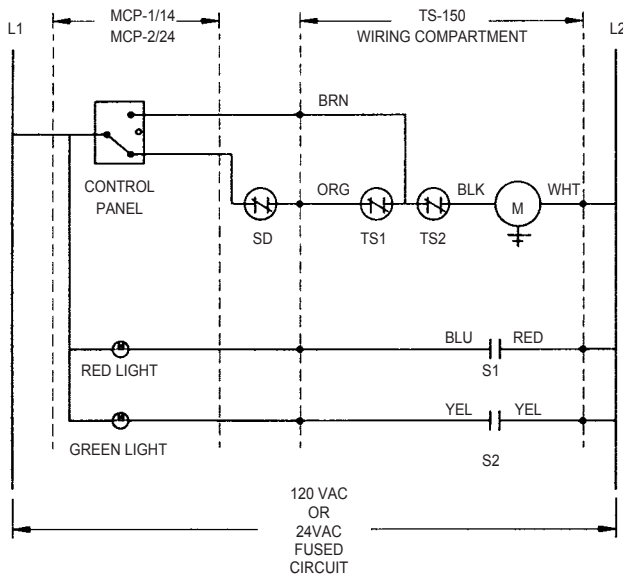
The MCP1/14 and MCP2/24 are ship loose single control panels for use with in dynamic smoke management systems on fire/smoke dampers equipped with the TS150. The MCP1/14 utilizes a toggle type switch and the MCP2/24 utilizes a removable key type switch. These control panels also have a red light for closed damper and a 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:

OPEN – The fire/smoke damper remains open until TS1 sensor is closed by elevated temperatures.

CLOSED – The fire/smoke damper closes and remains closed regardless of any sensor signal.

REOPEN (OVERRIDE) – The fire/smoke damper reopens manually after TS1 closes damper and remains open until TS2 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)



MCP1/14



MCP2/24

MCP10, MCP104, MCP20 and MCP204 MASTER CONTROL PANELS

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.

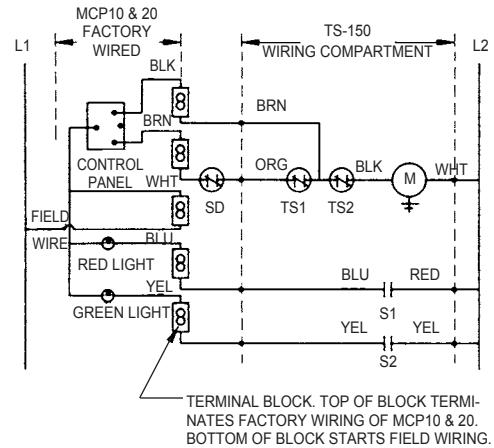
CLOSED position – The damper closes and remains closed regardless of any sensor signal.

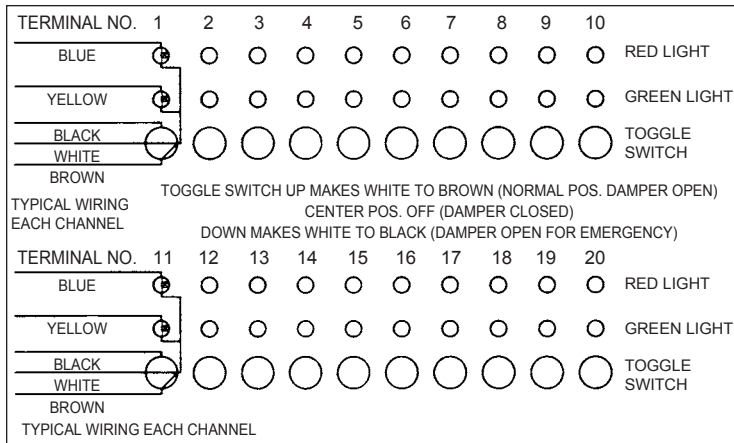
OPEN position – The damper opens and remains open until any optional sensor signals the damper to close and lock.



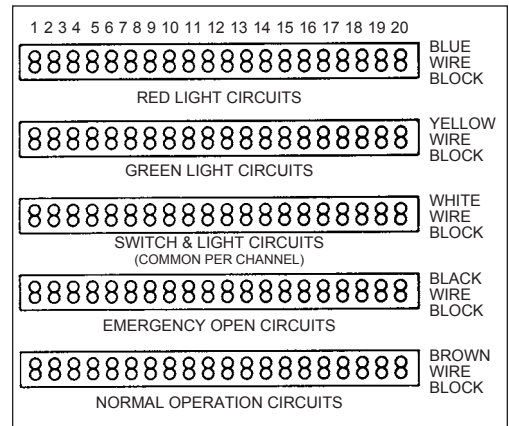
MCP20 shown

- 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 PANEL LAYOUT
FOR MCP10 AND MCP20**



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COMBINATION FIRE/SMOKE DAMPERS

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:

MAXIMUM LEAKAGE IN CFM/SQ. FT.			
Leakage Class	@4" w.g.	@8" w.g.	@12" w.g.
Class I	8	11	14
Class II	20	28	35
Class III	80	112	140

IBC Chapter 7

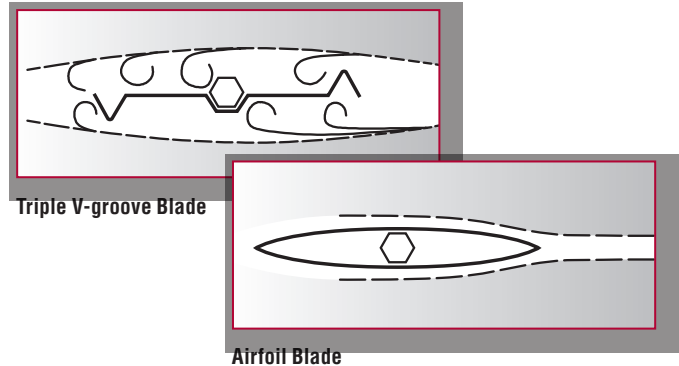
HVAC system designers are advised to select the lowest leakage class damper. However, there are some smoke control applications when a higher leakage class damper is acceptable.

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.

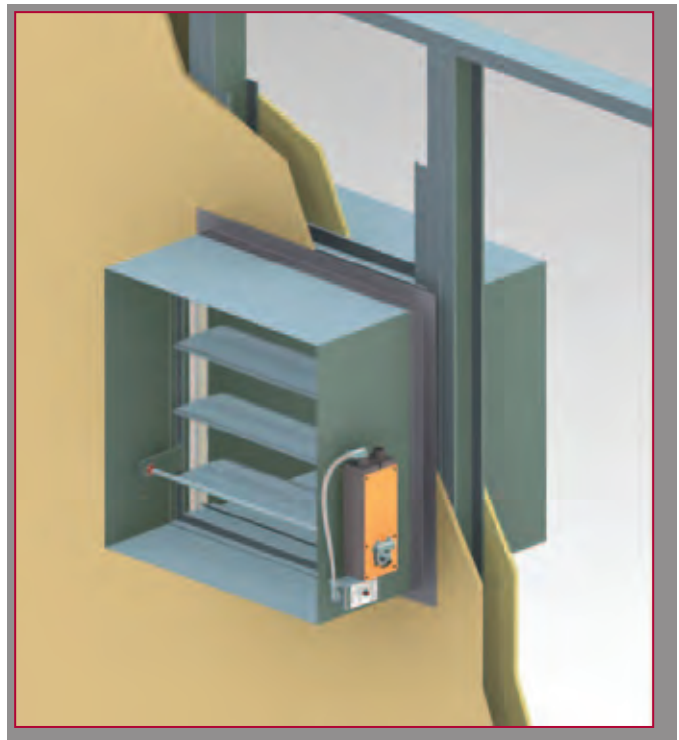
Blade Design

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.



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APPLICATION REFERENCE CHART

MODEL	HOURLY RATING	LEAKAGE CLASS	BLADE TYPE/ DESCRIPTION	MAXIMUM VELOCITY* (FPM)	MAXIMUM PRESSURE* (IN. W.G.)	MAXIMUM ASSEMBLY TEMP. (°F)*
Standard						
FSD60LP	1-1/2	I	Aerodynamic	2000	4	350
FSD60LP-2	1-1/2	II	Aerodynamic	2000	4	350
FSD60	1-1/2	I	Airfoil	4000	8	350
FSD60-2	1-1/2	II	Airfoil	4000	8	350
FSD60-3	3	I	Airfoil	4000	8	350
FSD60V	1-1/2	II	Airfoil	2000	4	350
FSD37	1-1/2	I	Triple V-Groove	2000	4	350
FSD36	1-1/2	II	Triple V-Groove	2000	4	350
FSD35	1-1/2	III	Triple V-Groove	2000	4	350
Grille & Grille Access						
FSD60FA	1-1/2	I	Airfoil	2000	4	350
FSD60GA	1-1/2	I	Airfoil	4000	4	350
FSD60-VGA	1-1/2	I	Airfoil	2000	4	350
FSD60G	1-1/2	I	Airfoil	4000	8	350
FSD60-2GA	1-1/2	II	Airfoil	4000	4	350
FSD36FA	1-1/2	II	Triple V-Groove	2000	4	350
FSD36GA	1-1/2	II	Triple V-Groove	2000	4	350
FSD36G	1-1/2	II	Triple V-Groove	2000	4	350
FSD35GA	1-1/2	III	Triple V-Groove	2000	4	350
FSD35G	1-1/2	III	Triple V-Groove	2000	4	350
Out of Wall/Floor						
FSD60OW	1-1/2	I	Airfoil	4000	4	350
FSD60-2OW	1-1/2	II	Airfoil	4000	4	350
FSD60-VOW	1-1/2	I	Airfoil	2000	4	350
FSD36OW	1-1/2	II	Triple V-Groove	2000	4	350
FSD35OW	1-1/2	III	Triple V-Groove	2000	4	350
True Round						
FSDR60/25	1-1/2	I	True Round	4000	4	350
Stainless Steel						
FSD37SS	1-1/2	I	Triple V-Groove	2000	4	350
FSD36SS	1-1/2	II	Triple V-Groove	2000	4	350
FSD35SS	1-1/2	III	Triple V-Groove	2000	4	350
Modulating & Balancing						
FSD60-3M	3	I	Airfoil	2000	4	350
FSD60M	1-1/2	I	Airfoil	2000	4	350
FSD60-3BAL	1-1/2	I	Airfoil	2000	4	350
FSD60-BAL	1-1/2	I	Airfoil	2000	4	350
FSD60FA-BAL	1-1/2	I	Airfoil	2000	4	350
FSD60FA-M	1-1/2	I	Airfoil	2000	4	350
Inspector™ Ready						
FSDXX-IR™	1-1/2	I	Triple V-Groove & Airfoil	2000	4	350
Explosion Proof						
FSD60XP	1-1/2	I	Airfoil	2000	4	350
Corridor						
DFSDR1	1	I	True Round	2000	4	350
FSD36C	1	II	Triple V-Groove	2000	4	350
FSD60C	1	I	Airfoil	2000	4	350
FSDR25C	1	I	True Round	2000	4	350

FSD60LP, 60LP-2, 37LP AND 36LP COMBINATION FIRE/SMOKE DAMPERS

LOW PROFILE/ULTRA-LOW PRESSURE DROP
1½ HR. RATING UL555 RATED UL555S CLASS I and II



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.

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

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International building Codes**
- **CSFM California State Fire Marshal** Listing (#3235-0245:0129)

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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Leakage Class	Hourly Rating
FSD60LP	Integral sleeve and frame 20 gauge (1.0) galvanized, single piece	Low profile, aerodynamic shaped, double skin of 16 (1.6) and 20 (1.00) gauge galvanized steel.	Stainless steel, sleeve type, pressed into frame	Stainless steel, flexible metal, compression type.	Stainless steel, flexible metal, compression type.	1	1 ½
FSD60LP-2						2	
FSD37LP						1	
FSD36LP						2	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD60LP, FSD60LP-2 FSD37LP, FSD36LP	6"w x 6"h (152 x 152)	36"w x 14"h (914 x 356)	36"w x 14"h (914 x 356)	N/A	N/A

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

RUSKIN®



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INSTALLATION INSTRUCTIONS

FSD36LP, FSD37LP, FSD60LP and FSD60LP-2

COMBINATION FIRE AND SMOKE DAMPERS

1 1/2 HOUR UL555 RATED

UL555S LEAKAGE CLASS I and II

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 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



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 1/8" 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 installation, 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 gauge (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 1 1/2" x 1 1/2" x 20 gauge 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 stud under the wallboard on metal stud wall installations only. Two angle installation the mounting angles must be attached only to the damper/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 **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.

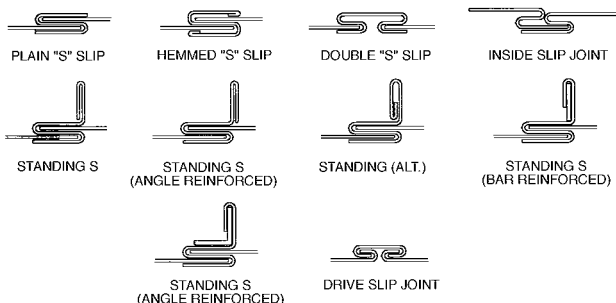
b. Mounting Angle Fastener Spacing

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 1 1/2" (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:



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 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

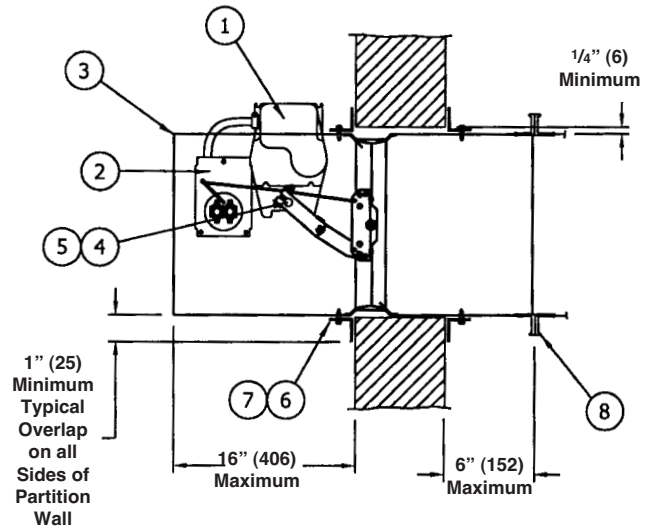
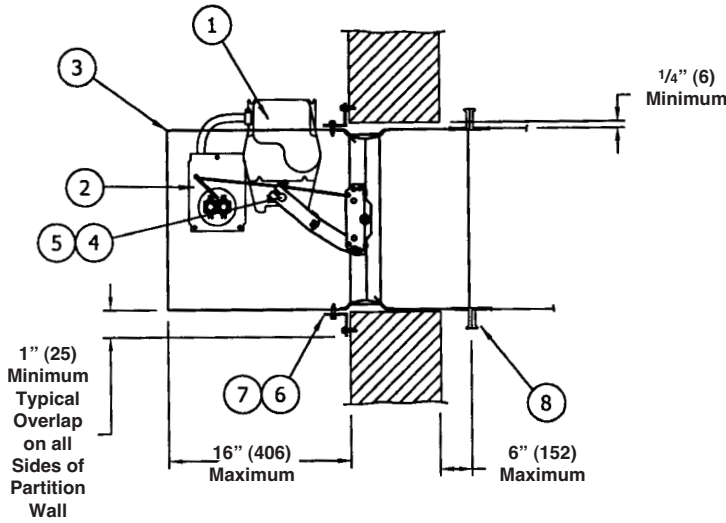
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

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 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.

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.

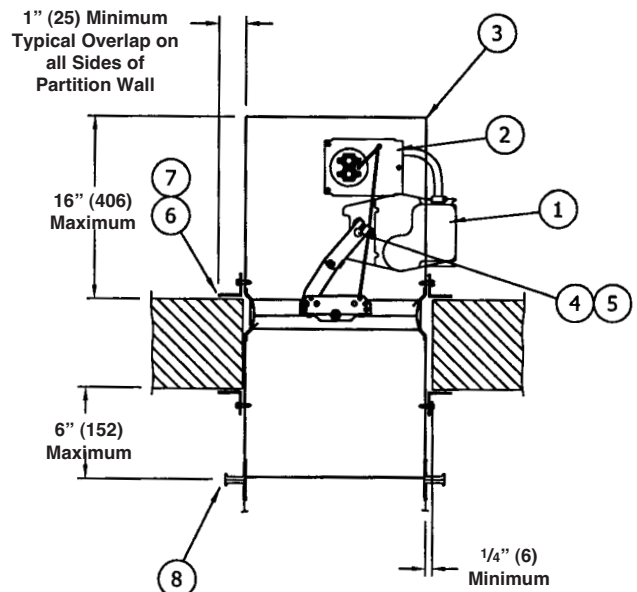
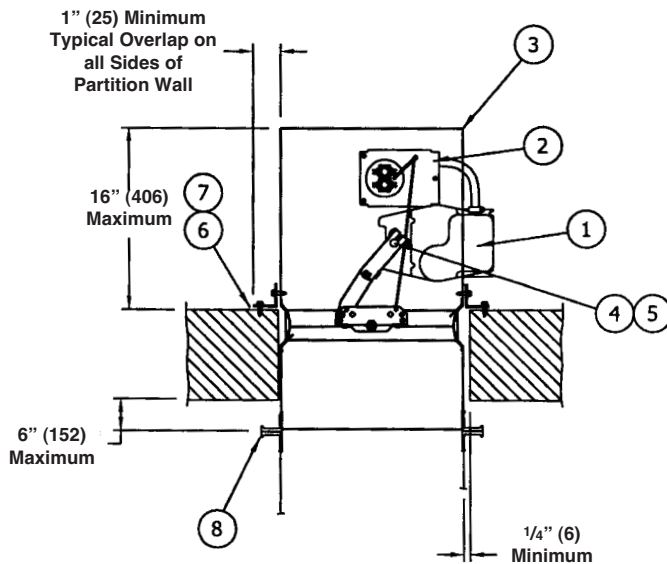
TWO ANGLE INSTALLATION
Angles are required on both sides of the partition.

- | 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.

FSDR25, FSDR60 and FSDR25SS COMBINATION FIRE/SMOKE DAMPERS

**TRUE ROUND ULTRA-LOW LEAKAGE
1 ½ HOUR RATED UL555 AND UL555S CLASS I**



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. w.g. (1 kPa).

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

Model FSDR25 series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3235-0245:0128) FSDR25(SS)
Listing (#3235-0245:0120) FSDR25C
- **New York City** (MEA 252-05-E)

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.
- **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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Blade Seal	Leakage Class	Hourly Rating
FSDR25 FSDR60	20 gauge (.9) galvanized steel. Standard 17" (432) long	Two-piece 14 gauge (1.9) equivalent thickness galvanized steel.	Stainless steel sleeve type, pressed into frame	Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).	1	1 ½
FSDR25SS	20 gauge (.9) 304 stainless steel. Standard 17" (432) long	Two-piece 14 gauge (1.9) equivalent thickness 304 stainless steel.	Stainless steel sleeve type, pressed into frame	Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).		

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
FSDR25, FSDR25SS	6" Dia. (152)	24" Dia. (609)

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INSTALLATION INSTRUCTIONS

FSDR60 COMBINATION FIRE AND SMOKE DAMPER

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

APPLICATION

The FSDR60 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

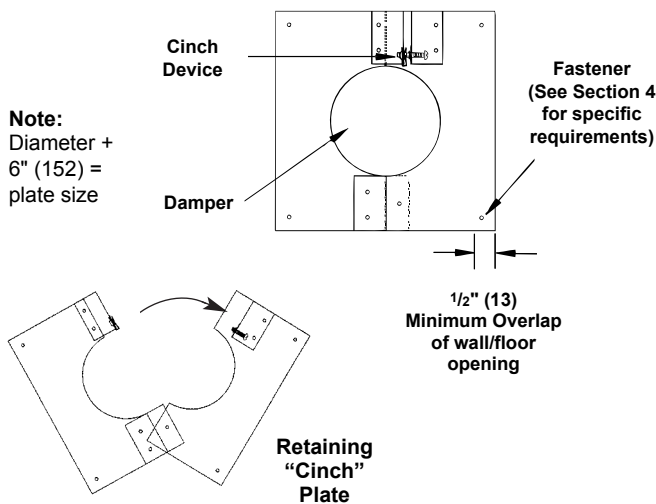
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:

- 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



SEE COMPLETE MARKING ON PRODUCT

California State Fire Marshal Listing No. FSDR25 - 3235-0245:0128

NYC Department Of Building MEA 252-05-E

II-FSDR60-316/Replaces II-FSDR60(SS)-814

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

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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 1/2" (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. 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, 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.

GENERAL INSTALLATION

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

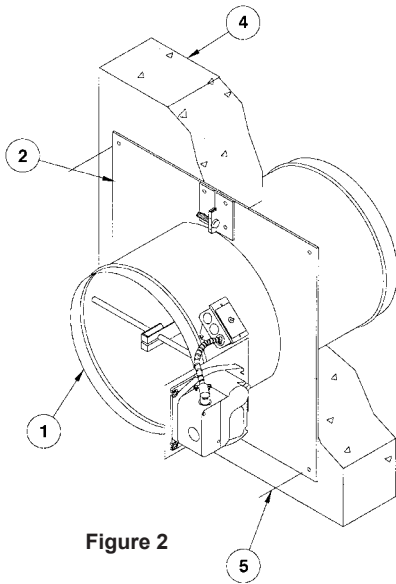


Figure 2

ITEM DESCRIPTION

- 1. FSDR60 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.

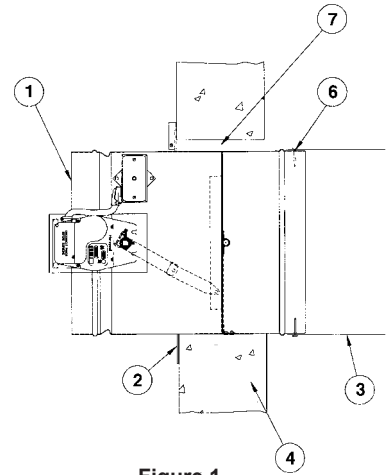
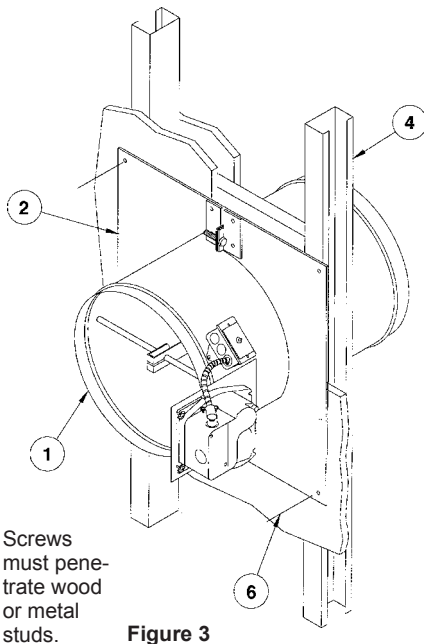


Figure 1

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



Screws must penetrate wood or metal studs.

Figure 3

ITEM DESCRIPTION

- 1. FSDR60 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.

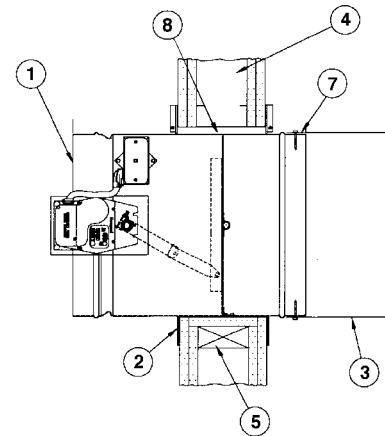
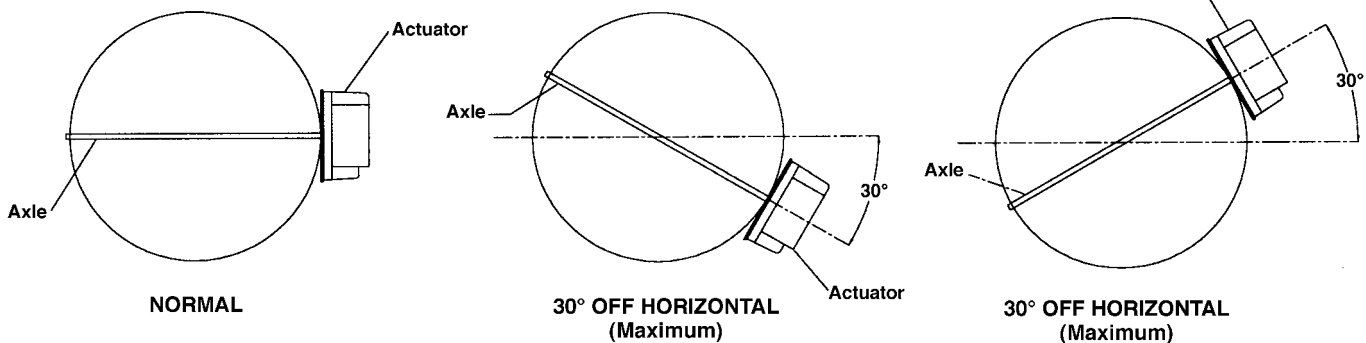


Figure 4

BLADE ORIENTATION



INSTALLATION INSTRUCTIONS

FSDR25 and FSDR25SS COMBINATION FIRE AND SMOKE DAMPER

1 1/2 HOUR UL555 RATED UL555S LEAKAGE CLASS I 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

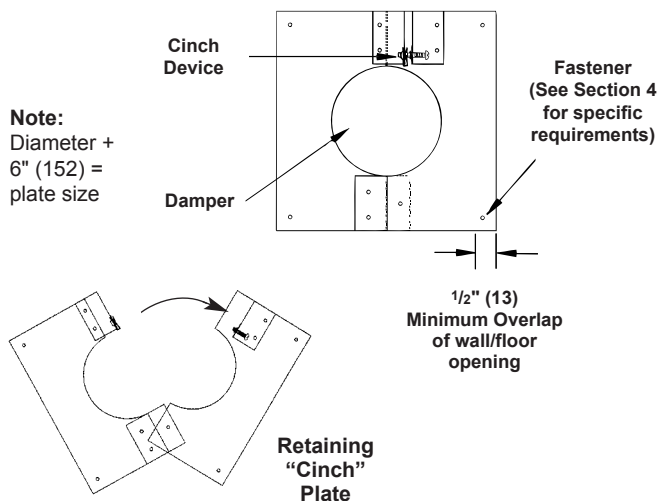
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:

- 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

RETAINING "CINCH" PLATE



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 gauge 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 1/2" (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 Polymeric - 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, 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.



SEE COMPLETE MARKING ON PRODUCT

California State Fire Marshal Listing No. FSDR25 - 3235-0245:0128

NYC Department Of Building MEA 252-05-E

GENERAL INSTALLATION

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

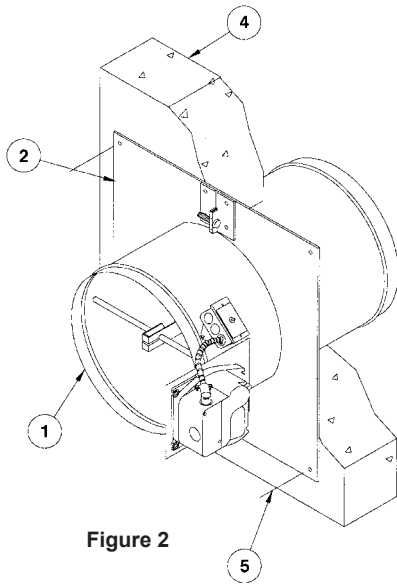


Figure 2

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 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.

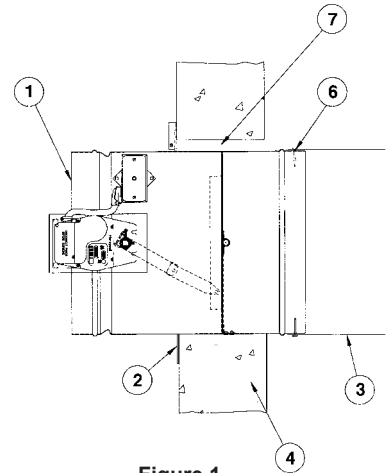
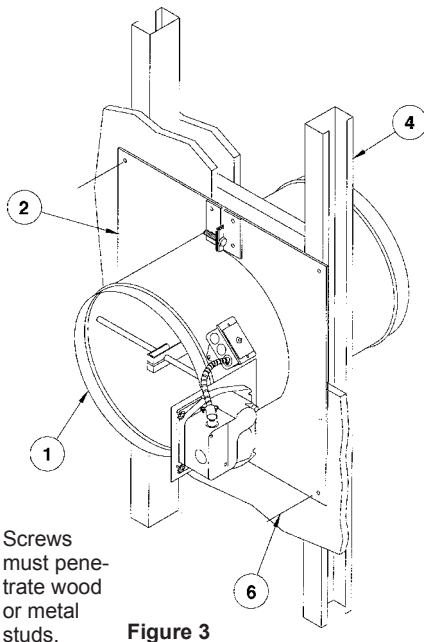


Figure 1

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



Screws must penetrate wood or metal studs.

Figure 3

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.

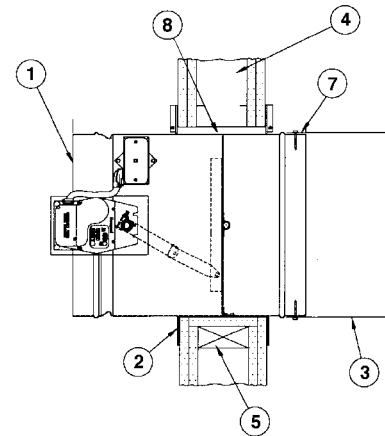
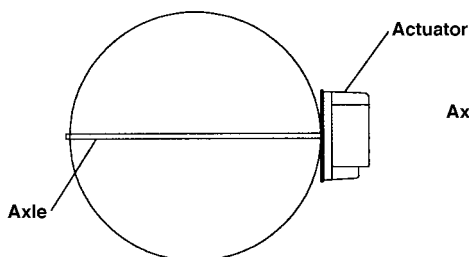
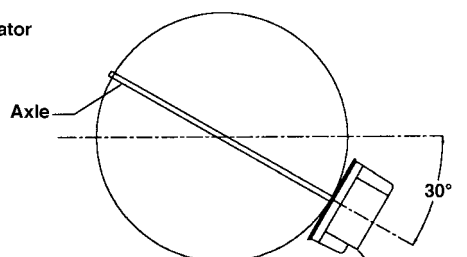


Figure 4

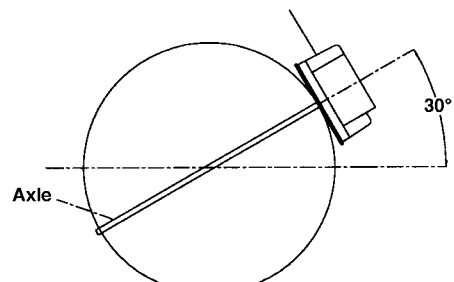
BLADE ORIENTATION



NORMAL



30° OFF HORIZONTAL
(Maximum)



30° OFF HORIZONTAL
(Maximum)

FSD60 and FSD60-2 COMBINATION FIRE/SMOKE DAMPER

HIGH PERFORMANCE/ULTRA-LOW LEAKAGE

1½ HOUR UL555 RATED

UL555S CLASS I and II



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. w.g. (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.

Model FSD60 series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association NFPA Standards 80, 90A, 92A, 92B, 101 and 105.**
- **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) 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.
- **DSDFD/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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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
FSD60-2							2	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD60 FSD60-2	8"w x 6"h (203 x 152)	32"w x 48"h (813 x 1219)	30"w x 48"h (762 x 1219)	120"w x 96"h (3048 x 2438)	144"w x 96"h (3658 x 2438)

*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.

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FSD60V COMBINATION FIRE/SMOKE DAMPER

VERTICAL BLADE

1½ HOUR UL555 RATED

UL555S CLASS II



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. w.g. (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.

Model FSD60V series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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) 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.
- **DSD/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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60V	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, 6" (152) wide and 14 (2.0) gauge 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.	2	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD60V	6"w x 8"h (152 x 203)	48"w x 32"h (1219 x 813)	48"w x 30"h (1219 x 762)	N/A	N/A

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

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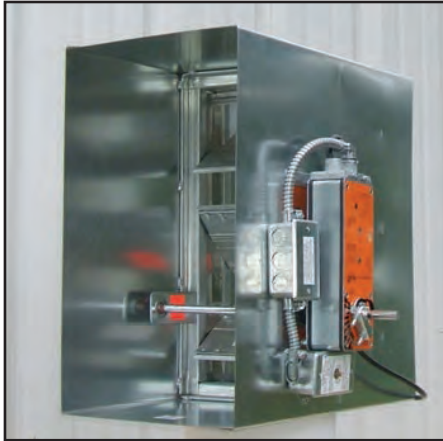
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FSD60M COMBINATION FIRE/SMOKE DAMPER

MODULATING, ULTRA-LOW LEAKAGE

1½ HOUR UL555 RATED

UL555S CLASS I



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.

Model FSD60M series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association NFPA Standards 80, 90A, 92A, 92B, 101 and 105.**
- **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).
- 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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60M	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section*	
		Vertical	Horizontal	Vertical	Horizontal**
FSD60M	8"w x 6"h (203 x 152)	32"w x 48"h (813 x 1219)	30"w x 48"h (762 x 1219)	120"w x 48"h (3048 x 1219) Or 64"w x 96"h (1626 x 2438)	120"w x 48"h (3048 x 1219) Or 60"w x 96"h (1524 x 2438)

RUSKIN®



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FSD60-XP COMBINATION FIRE/SMOKE DAMPER

HAZARDOUS LOCATION

1½ HOUR UL555 RATED

UL555S CLASS I



APPLICATION

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 gauges 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 gauges also for one-side or two-side installation.

Model FSD60XP series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3235-0245:0126)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60XP	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD60XP	8"w x 6"h (203 x 152)	32"w x 48"h (813 x 1219)	30"w x 48"h (762 x 1219)	64"w x 48"h (1626 x 1219)	60"w x 48"h (1524 x 1219)

RUSKIN®



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INSTALLATION INSTRUCTIONS

FSD60, FSD60-2, FSD60-V, FSD60XP, and FSD60M

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, 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).
- Multiple sections horizontal – 120"w x 48"h (3048 x 1219) or 60"w x 96"h (1524 x 2438).

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 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



SEE COMPLETE MARKING
ON PRODUCT

California State Fire Marshal Listing No.

FSD60, 60-2, 60M, 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 1/8" 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

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 1/8" (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 gauge 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 (1.5) for dampers up to 36" (914) wide by 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

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 1/2" x 1 1/2" x 20 gauge 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 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" (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

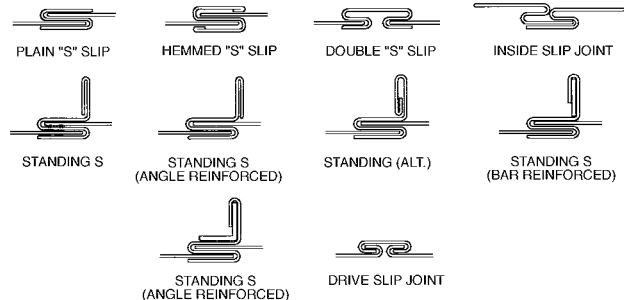
For one angle installations the sleeve fasteners shall be spaced at 6" (152) o.c. and the wall or floor fasteners shall be spaced at 12" (305) o.c. with a minimum of 2 fasteners on each side, top and bottom. Screw fasteners used in metal stud must engage

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 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:



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 91" (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 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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers 36" (914) wide x 24" (610) high.

7. Actuator Connections

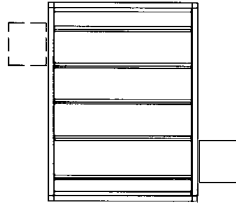
Electric and pneumatic actuators are to be connected in accordance with applicable codes, ordinances and regulations. Damper assemblies having more than one actuator must have all actuators wired to a single heat actuated device. This is required for simultaneous closure of all sections. Refer to the EFL, TS150, EFL/SP100 or PFL Operation Instructions Supplement for wiring and piping diagrams.

8. Installation and Maintenance

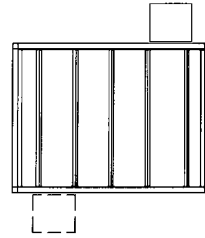
Each fire/smoke damper should be examined on a regular basis to ensure it is not rusted or blocked. In addition, each damper should be tested periodically, (NFPA recommends annually or semiannually, depending on the application) to ensure it will perform as intended. Care should be exercised to ensure that such tests are performed safely and do not cause system damage.

ORIENTATION

Motor Location
FSD60, FSD60-2, FSD60M,
FSD60XP

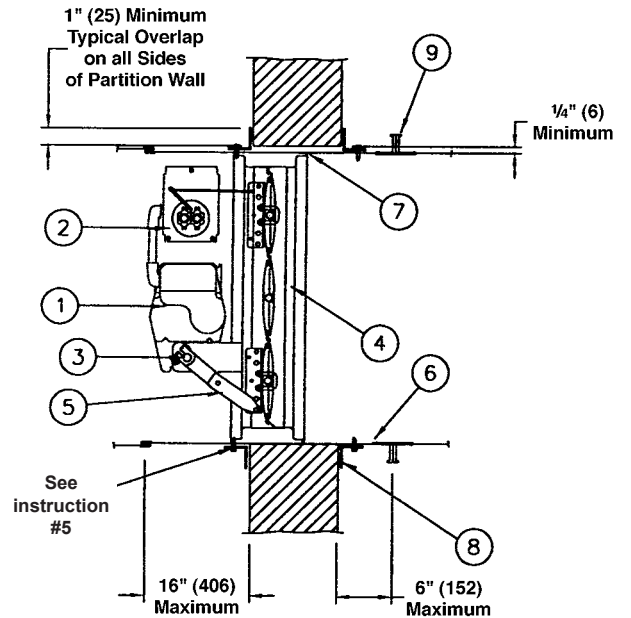
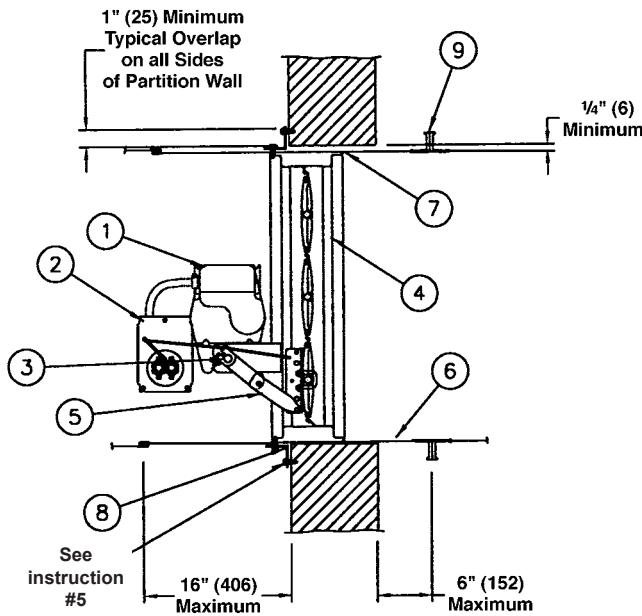


Motor Location
FSD60-V



VERTICAL INSTALLATION

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



FAST ANGLE (ONE ANGLE) INSTALLATION
Angle may be installed on either side of the partition.

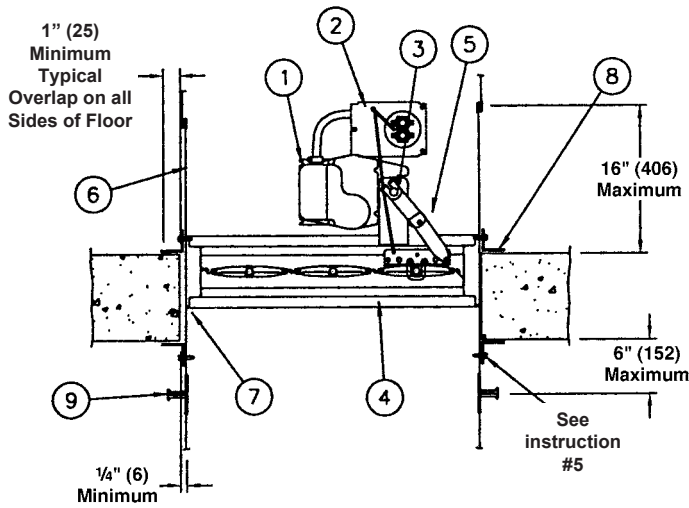
TWO ANGLE INSTALLATION
Angles are required on both sides of the partition.

ITEM DESCRIPTION

1. Actuator (location may vary).
2. Optional FireStat or SP100.
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)
9. Duct/sleeve connection.

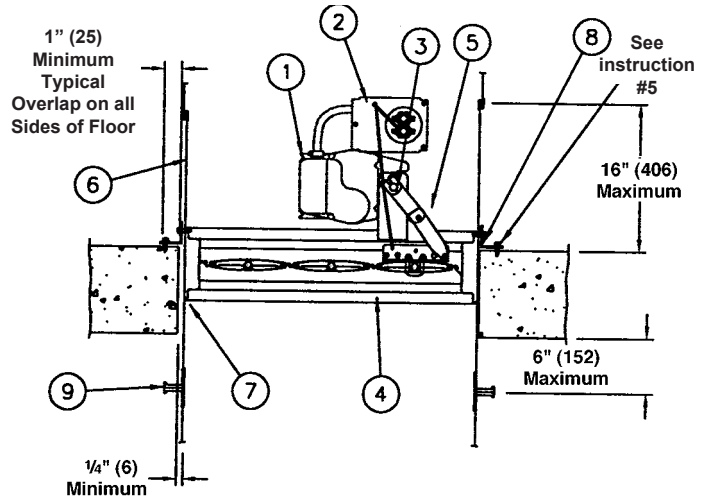
HORIZONTAL INSTALLATION

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.

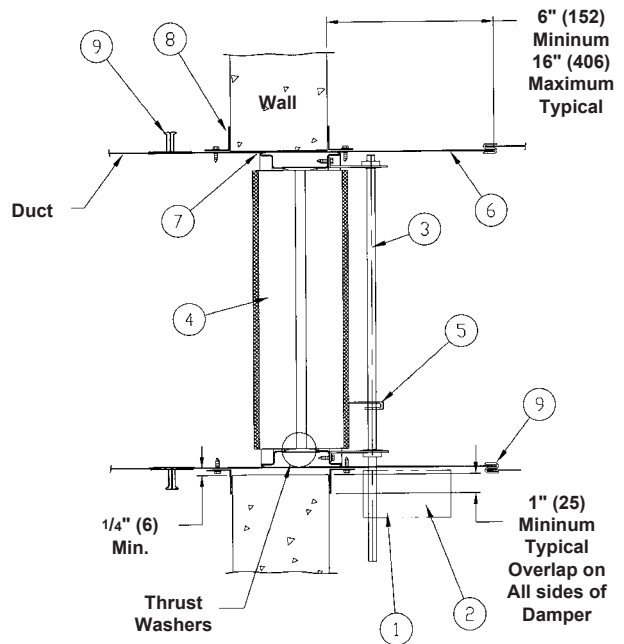


FAST ANGLE (ONE ANGLE) INSTALLATION

Angle must be installed on top of floor.

ITEM	DESCRIPTION
1.	Actuator (location may vary).
2.	Optional FireStat or SP100.
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)
9.	Duct/sleeve connection.

FSD60-V INSTALLATION (VERTICAL ONLY)



RECOMMENDED FRAMING FOR OPENINGS IN WOOD AND METAL STUD WALLS

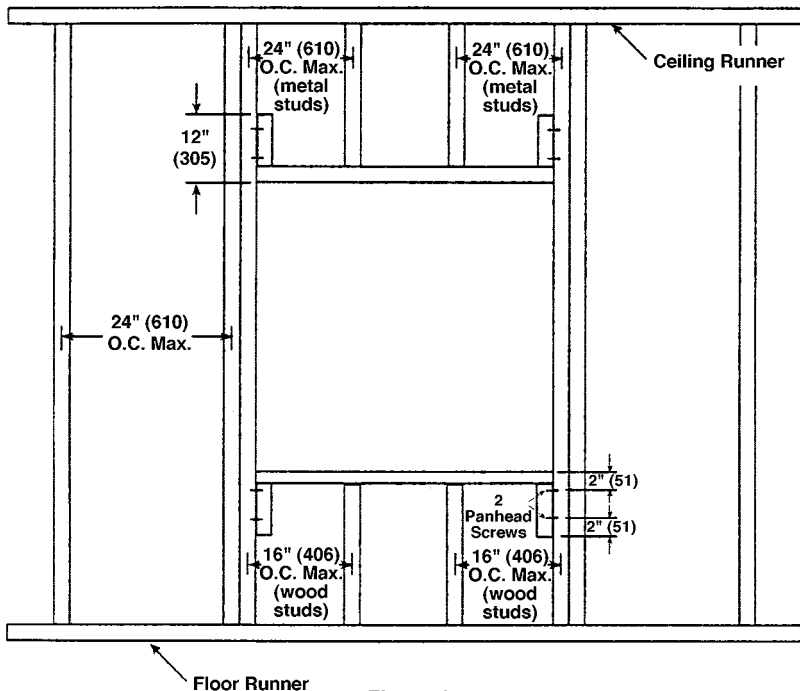


Figure 1

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.

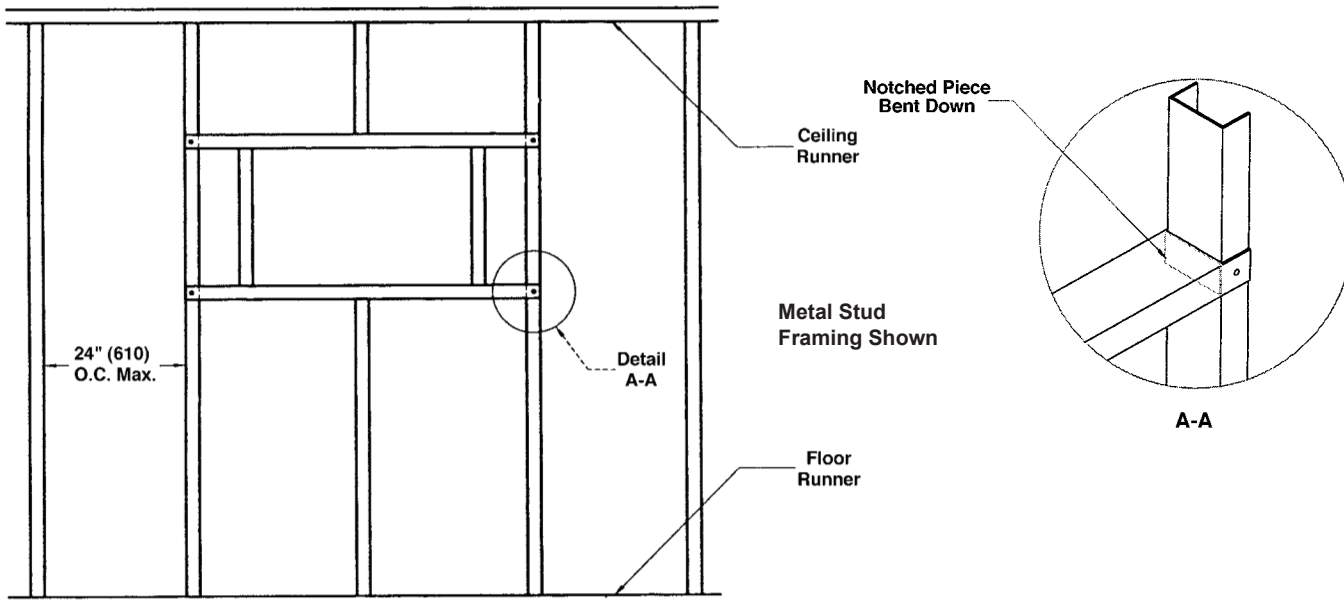
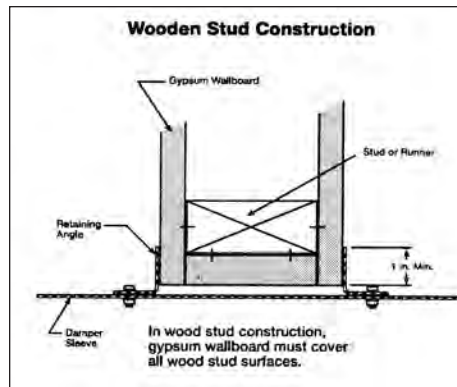
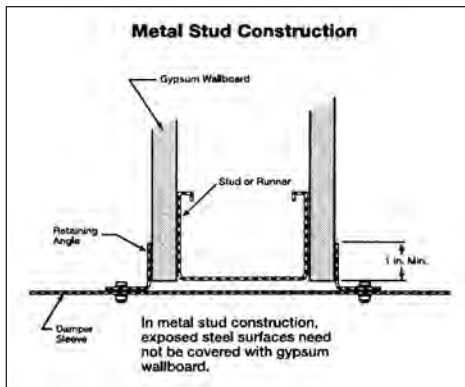


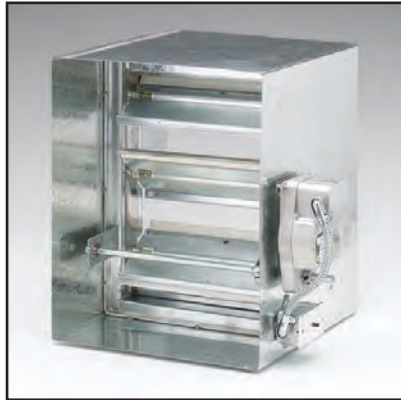
Figure 2



FSD35, FSD36 and FSD37 COMBINATION FIRE/SMOKE DAMPERS

1½ HOUR UL555 RATED

UL555S CLASS I, II, and III



APPLICATION

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) gauge 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. w.g. (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.

Model FSD36 series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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)

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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD35	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge galvanized steel.	Stainless steel sleeve type, pressed into frame	Stainless steel flexible metal compression type.	N/A	Concealed in frame.	3	1 ½
FSD36					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.		2	
FSD37							1	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD35	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	36"w x 48"h (914 x 1219)	120"w x 96"h (3048 x 2438)	144"w x 96"h (3658 x 2438)
FSD36		32"w x 48"h (813 x 1219)	30"w x 48"h (762 x 1219)	120"w x 96"h (3048 x 2438)	
FSD37					

RUSKIN®



Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

INSTALLATION INSTRUCTIONS
FSD35, FSD36 AND FSD37 COMBINATION
FIRE and SMOKE DAMPERS

1 1/2 HOUR UL555 RATED UL555S LEAKAGE RATED CLASS I, II, and III

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



SEE COMPLETE MARKING
ON PRODUCT

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" 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

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 1/8" (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 gauge 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 by 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

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 1/2" x 1 1/2" 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

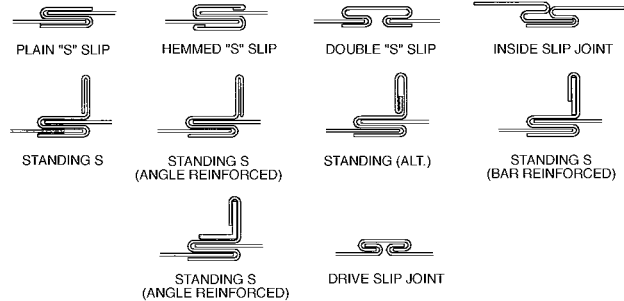
For one angle installations the sleeve fasteners shall be spaced at 6" (152) o.c. and the wall fasteners shall be spaced at 12" (305) o.c. with a minimum of 2 on each side, top and bottom. Screw fasteners used in metal stud must engage the metal stud

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 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



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

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

7. Actuator Connections

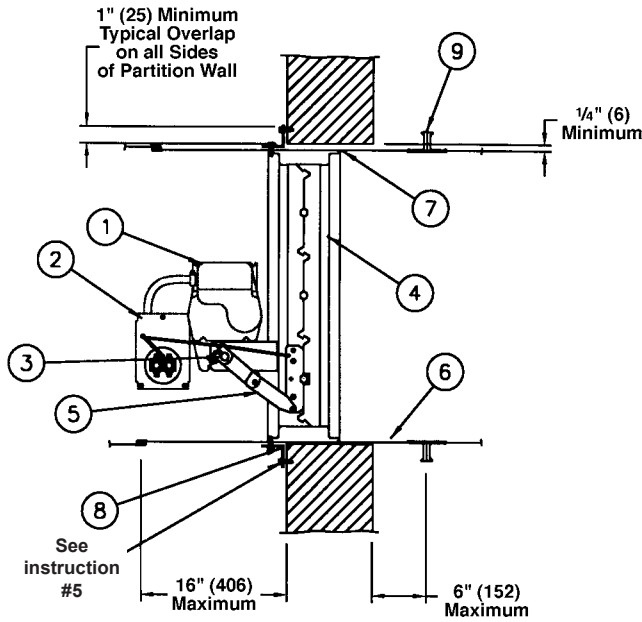
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

8. Installation and Maintenance

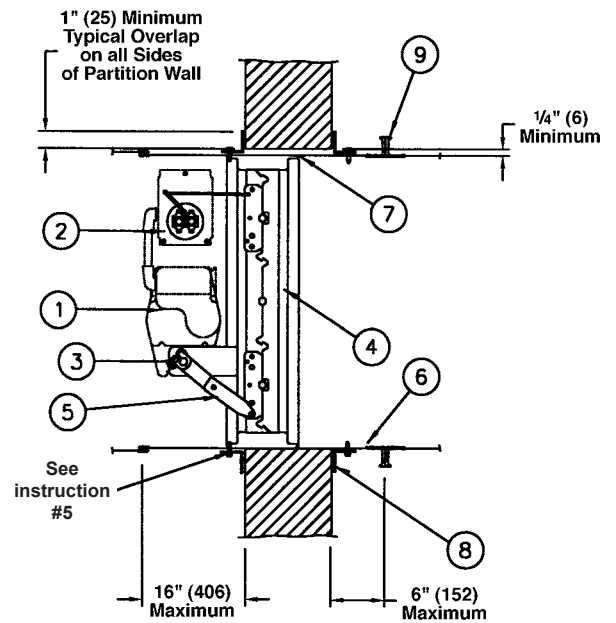
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire/smoke damper should be maintained, cycled and tested at intervals not less than every six months and in accordance with the latest editions of NFPA 90A, 92A, UL864, local codes and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

VERTICAL INSTALLATION

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



FAST ANGLE (ONE ANGLE) INSTALLATION
Angle may be installed on either side of the partition.



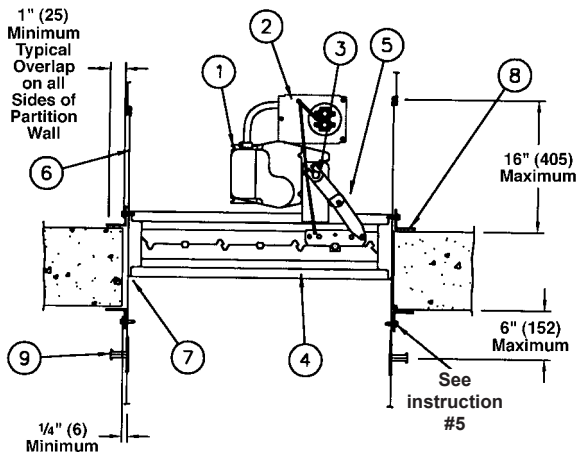
TWO ANGLE INSTALLATION
Angles are required on both sides of the partition.

ITEM	DESCRIPTION
1.	Actuator (location may vary).
2.	Optional FireStat or SP100.
3.	Auxiliary Operating Jackshaft
4.	Damper
5.	Over-Center Link

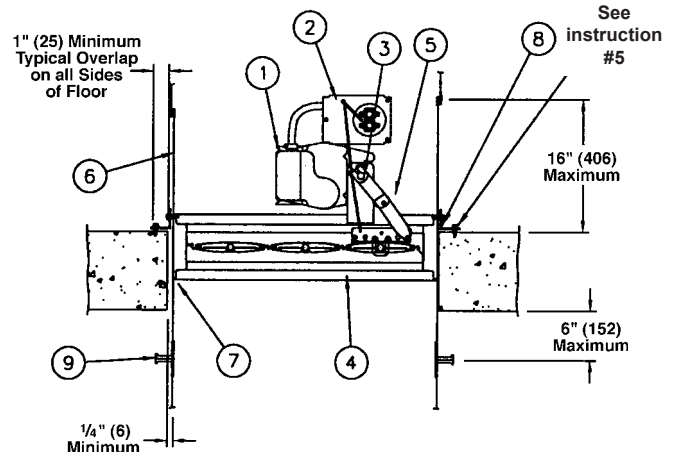
ITEM	DESCRIPTION
6.	Sleeve
7.	Caulking Material (may be on either side of damper frame).
8.	Mounting Angles (PFMA, FAST, or conventional angles)
9.	Duct/sleeve connection.

HORIZONTAL INSTALLATION

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

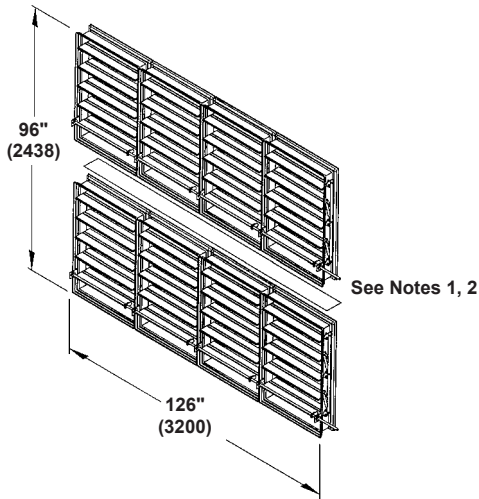


TWO ANGLE INSTALLATION
Angles are required on both sides of the floor.

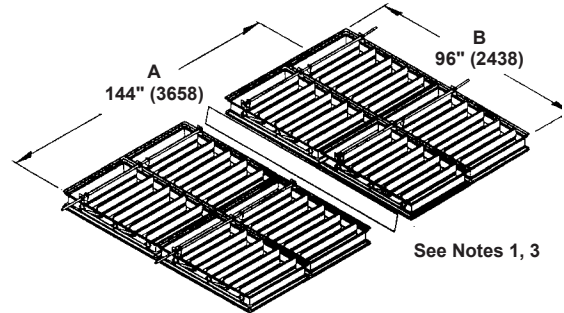


FAST ANGLE (ONE ANGLE) INSTALLATION
Angle may be installed on top of floor.

**MAXIMUM UL CLASSIFIED SIZE
(Vertical Installation)
FSD36**



**MAXIMUM UL CLASSIFIED SIZE
(Horizontal Installation)
FSD36**



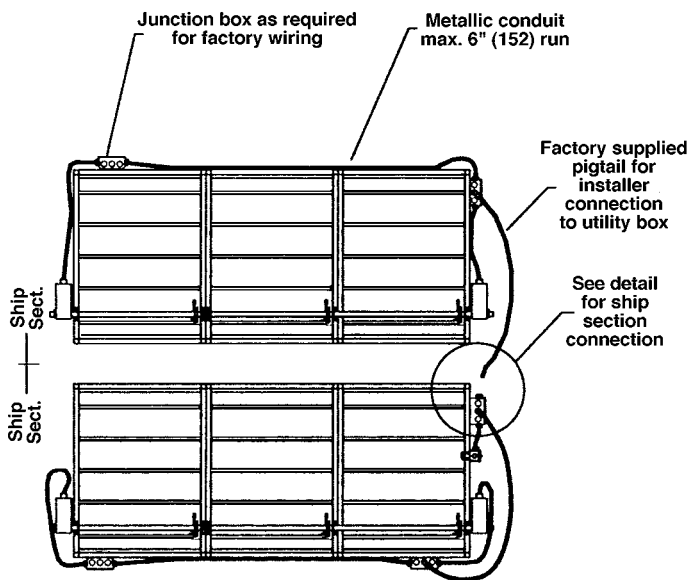
Notes:

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 gauge 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 gauge reinforcing plate. When using two individually sleeved units, the sleeve acts as the reinforcing plate, therefore no plate is required.

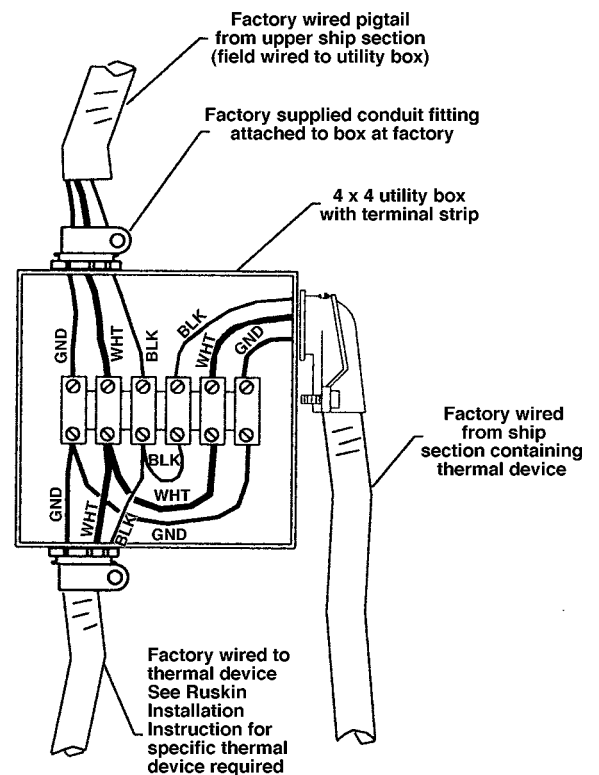
MULTIPLE ACTUATOR DAMPER ASSEMBLIES

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.

FSD60-3 and FSD60-3M FIRE/SMOKE DAMPERS

**HIGH PERFORMANCE/ULTRA-LOW LEAKAGE
3 HOUR RATED UL555 UL555S CLASS I**



APPLICATION

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. w.g. (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.

Model FSD60-3 series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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) 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.
- **DSD/DFD** 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 gauges 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 gauges also for one-side or two-side installation

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60-3 and (-3M)	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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	3

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section*	
		Vertical	Horizontal	Vertical	Horizontal**
FSD60-3	8"w x 6"h (203 x 152)	30"w x 48"h (762 x 1219)	30"w x 48"h (762 x 1219)	120"w x 96"h (3048 x 2438)	120"w x 96"h (3048 x 2438)
FSD60-3M				120"w x 48"h (3048 x 1219) Or 64"w x 96"h (1626 x 2438)	120"w x 48"h (3048 x 1219) Or 60"w x 96"h (1524 x 2438)

* 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.

RUSKIN®



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INSTALLATION INSTRUCTIONS

FSD60-3 and FSD60-3M COMBINATION FIRE AND SMOKE DAMPER

3 HOUR UL555 RATED UL555S LEAKAGE CLASS 1 RATED

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)
60"w x 96"h (1524 x 2438)
- Multiple sections horizontal – 120"w x 96"h (3048 x 2438)
60"w x 96"h (1524 x 2438)

Note: 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
- 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
- DSDF Flow Rated Duct Smoke Detector
- DSDN No-Flow Rated Duct Smoke Detector



SEE COMPLETE
MARKING ON PRODUCT

California State Fire Marshal Listing No.
FSD60-3 and 60-3M - 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. 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.

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 1/8" (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 gauge 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 by 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

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 1 1/2" x 1 1/2" x 20 gauge 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 tack welds or 3/16" (3) diameter steel rivets.

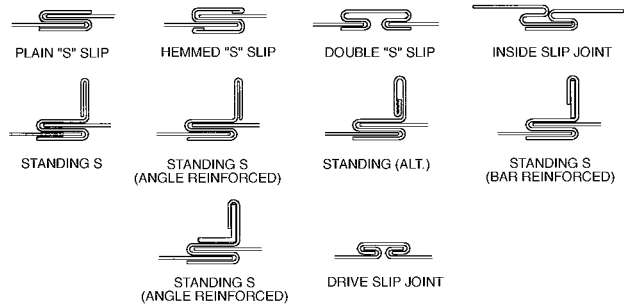
b. Mounting Angle Fastener Spacing

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:



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.

d. Non-Break-away Duct/Sleeve Connections

If other duct/sleeve connections are 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 (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.

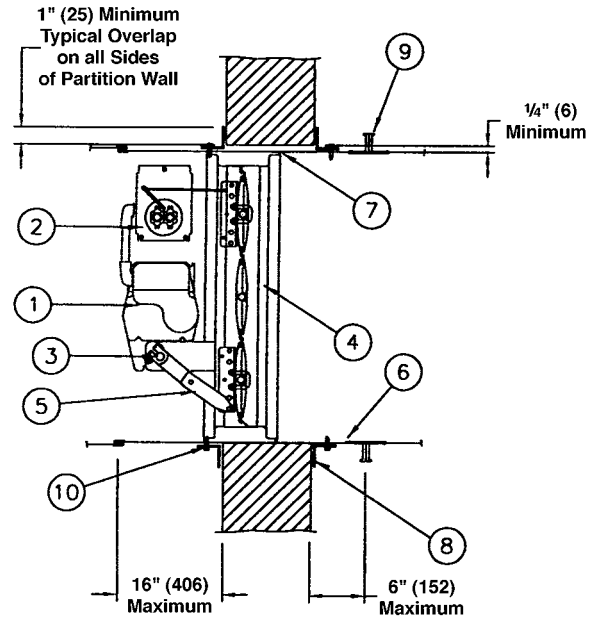
8. Installation and Maintenance

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.

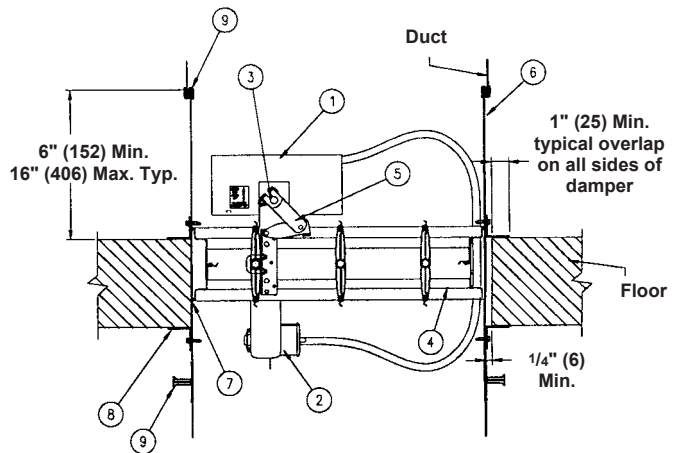
ITEM	DESCRIPTION
1.	Actuator (location may vary).
2.	Optional FireStat or SP-100.
3.	Auxiliary Operating Jackshaft
4.	Damper
5.	Over-Center Link
6.	Sleeve
7.	Caulking Material (may be on either side of damper frame).
8.	Mounting Angles (PFMA, FAST or conventional angles)
9.	Duct/sleeve connection.



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.

ITEM	DESCRIPTION
1.	Actuator
2.	EFL or PFL as required (optional TS150 or SP100)
3.	Auxiliary Operating Jackshaft
4.	Damper
5.	Over-Center Lock
6.	Sleeve
7.	Caulking Material (may be on either side of damper frame).
8.	PFMA mounting angles
9.	Duct/sleeve connection.



RECOMMENDED FRAMING FOR OPENINGS IN WOOD AND METAL STUD WALLS

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.

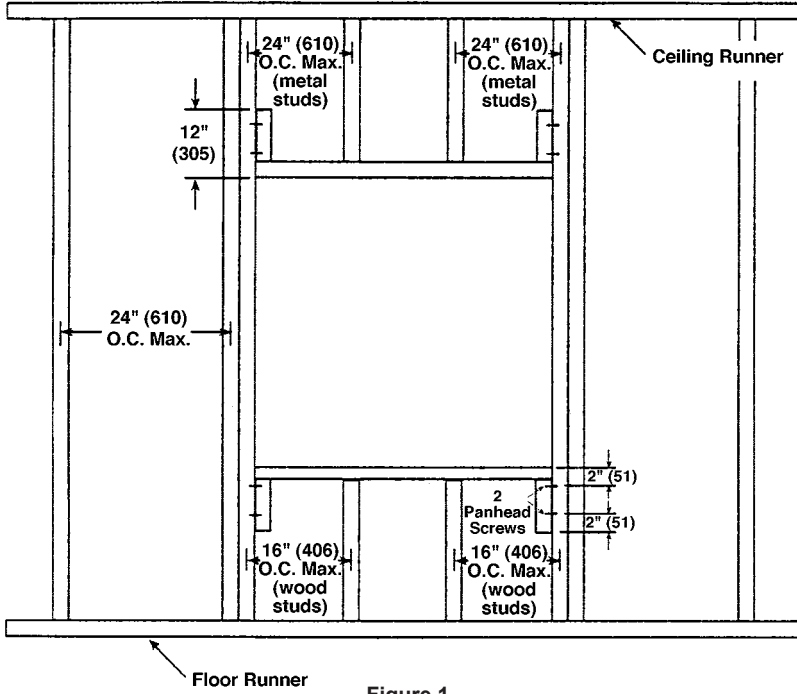


Figure 1

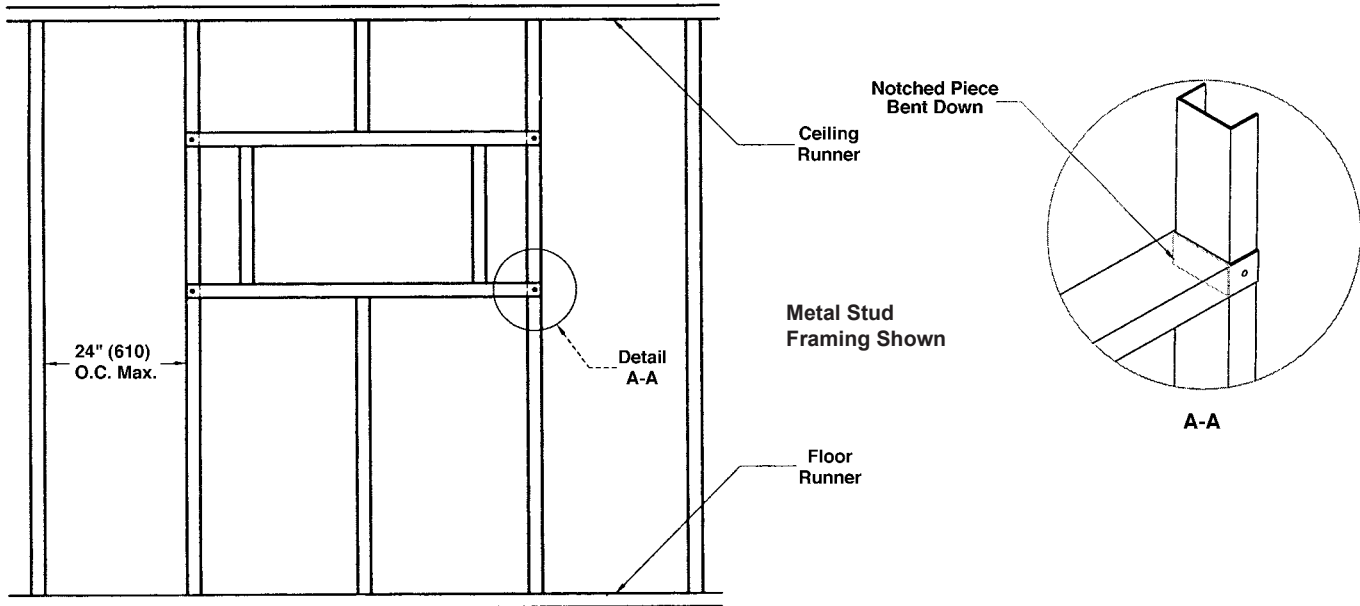
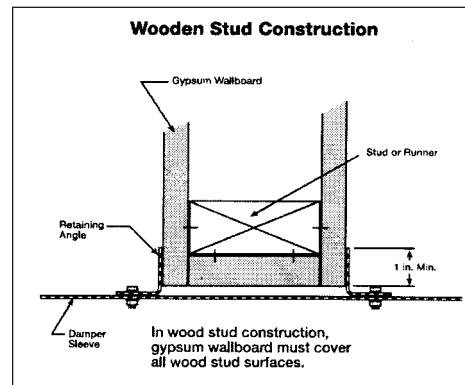
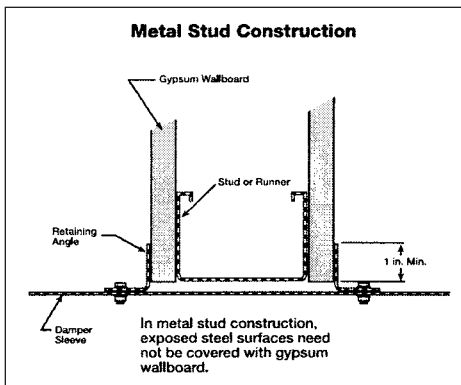


Figure 2



FSD35SS, FSD36SS and FSD37SS FIRE/SMOKE DAMPERS

STAINLESS STEEL

1½ HOUR UL555 RATED

UL555S CLASS I, II, and III



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) gauge 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. w.g. (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.

Model FSD36SS series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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)

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 airstream) or internal (in airstream) 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.
- **DSD/DSND** 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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD35SS	5" x 16 gauge (127 x 1.6) stainless steel, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge stainless steel.	Stainless steel sleeve type, pressed into frame	Stainless steel flexible metal compression type.	N/A	Concealed in frame.	3	1 ½
FSD36SS					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.		2	
FSD37SS							1	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD35SS	8"w x 6"h (203 x 152)	30"w x 48"h (762 x 1219)	30"w x 48"h (762 x 1219)	90"w x 48"h (2286 x 1219)	90"w x 48"h (2286 x 1219)
FSD36SS					
FSD37SS	12"w x 6"h (305 x 152)	24"w x 32"h (610 x 813)	24"w x 32"h (610 x 813)	90"w x 32"h (2286 x 813)	90"w x 32"h (2286 x 813)

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

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INSTALLATION INSTRUCTIONS

FSD35SS, FSD36SS AND FSD37SS

COMBINATION FIRE AND SMOKE DAMPERS

1 1/2 HOUR UL555 RATED

UL555S LEAKAGE RATED CLASS I, II, and III

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 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 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



SEE COMPLETE MARKING
ON PRODUCT

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

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 $\frac{3}{16}$ " per foot (5 per 305) larger than the overall size of the damper/sleeve assembly. The maximum opening size shall not exceed $\frac{3}{16}$ " 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 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 1/8" (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 gauge 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 by 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

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 $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x 20 gauge 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, $\frac{3}{16}$ " (3) steel rivets or 1/2" (13) long welds.

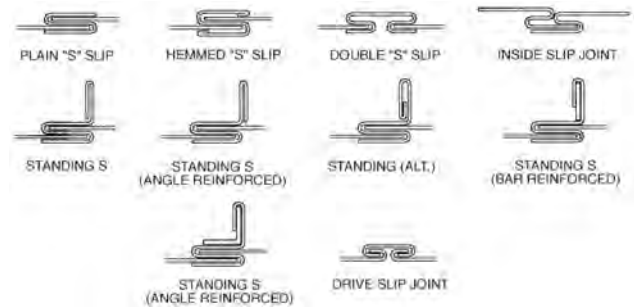
b. Mounting Angle Fastener Spacing

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 Polymerics – 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 $\frac{3}{8}$ " (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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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.

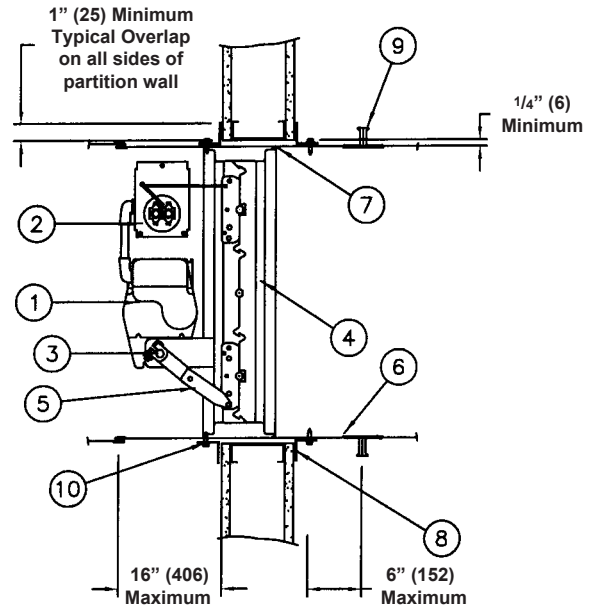
VERTICAL INSTALLATION

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)

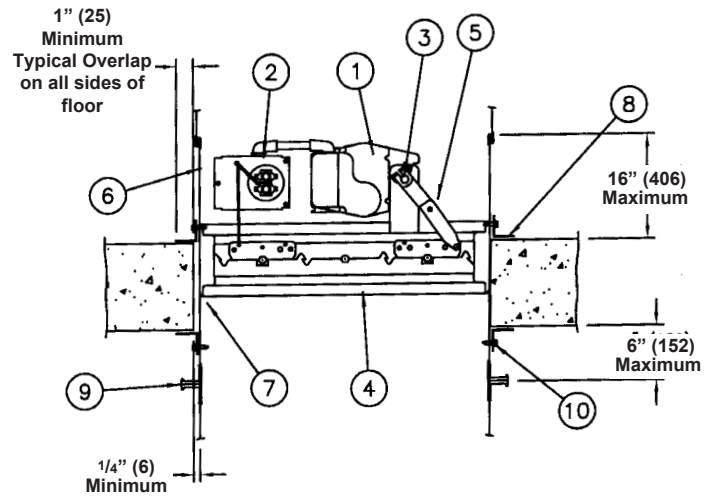
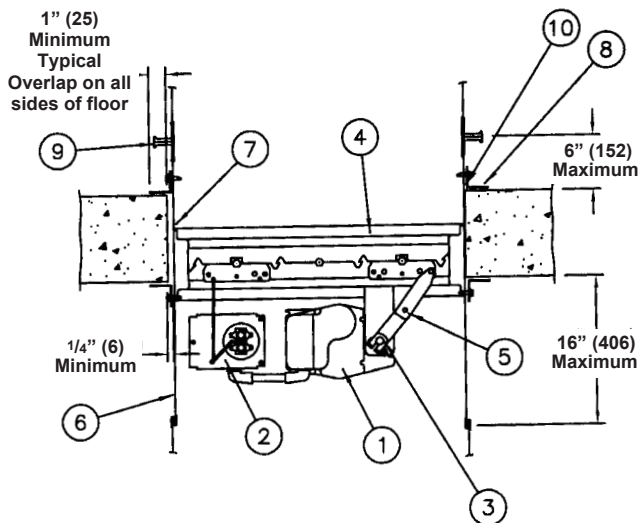


HORIZONTAL INSTALLATION

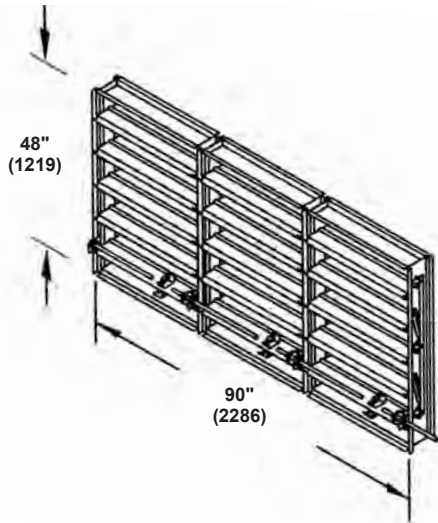
Damper may be installed with actuator on either side of the floor in accordance with the mounting label on the damper.

TWO ANGLE INSTALLATION

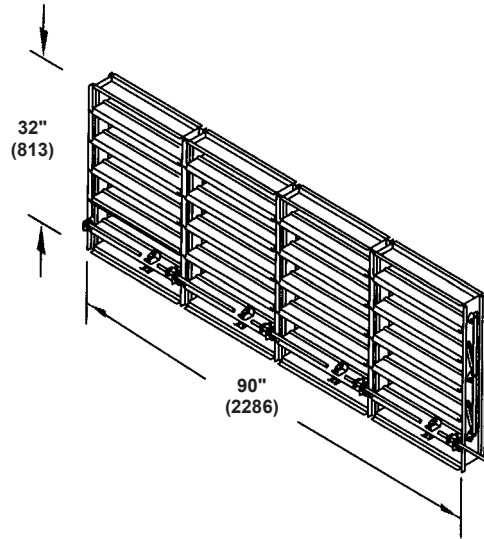
Angles are required on both sides of the floor.



**MAXIMUM UL CLASSIFIED SIZE
FSD35SS and FSD36SS**



**MAXIMUM UL CLASSIFIED SIZE
FSD37SS**



NOTE

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

FSD60FA and FSD36FA “FRONT ACCESS FIRE/SMOKE DAMPERS

LOW LEAKAGE

1 1/2 HOUR UL555

UL555S CLASS I and II



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.

Model FSD60FA and FSD36FA series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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)

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

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60FA	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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 1/2
FSD36FA	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge galvanized steel.	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.	2	1 1/2

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD60FA	12"w x 8"h (305 x 203)	48"w x 48"h (1219 x 1219)	N/A	N/A	N/A
FSD36FA		36"w x 36"h (914 x 914)			

RUSKIN®



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INSTALLATION INSTRUCTIONS
FSD60FA, FSD36FA, and FSD60FA-M
FRONT ACCESS COMBINATION FIRE AND SMOKE DAMPER
1 1/2 HOUR UL555 AND UL555S CLASS I OR CLASS II CLASSIFIED

APPLICATION

Model FSD60FA, FSD60FA-M 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 and FSD60FA-M

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)

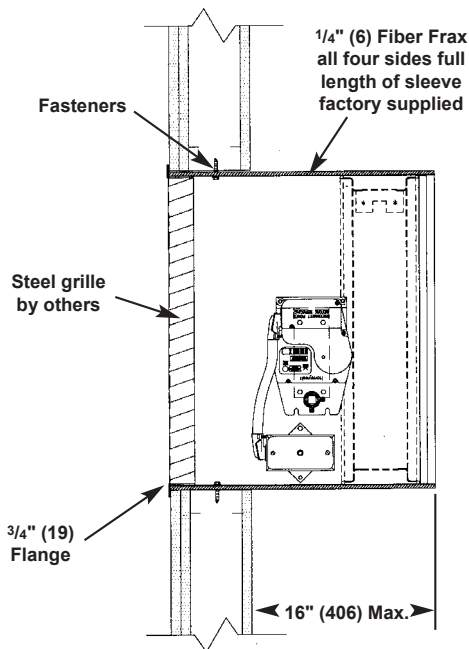
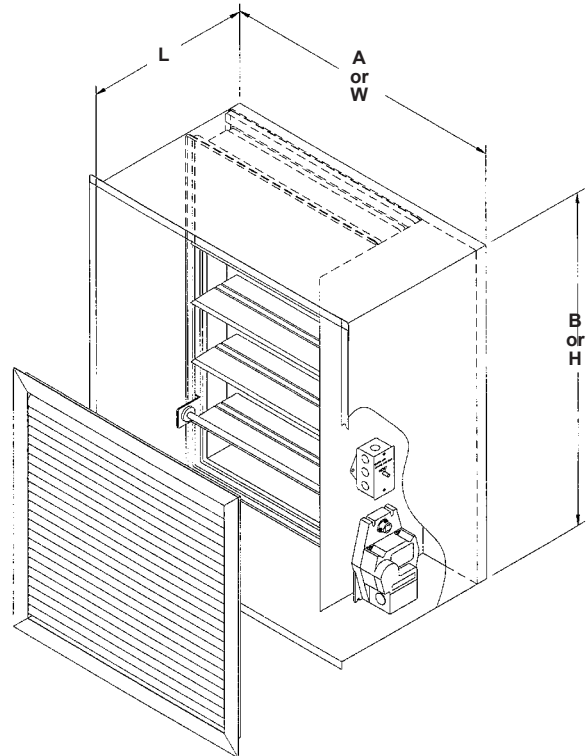
Duct Connection: 30"w x 36"h (726 x 914)

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.



California State Fire Marshal Listing No.

FSD36FA – 3225-0245:0124

FSD60FA – 3230-0245:0126

TYPICAL FSD60FA or FSD36FA INSTALLATION

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 gauge 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 by 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 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

- 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
- 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).

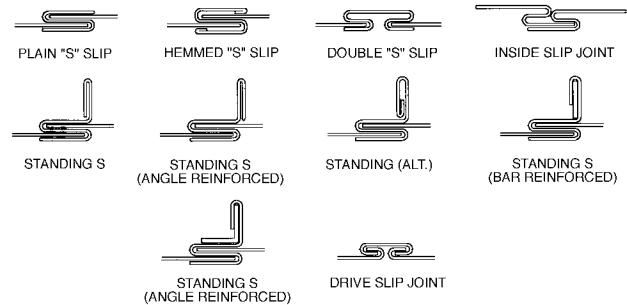
6. Mounting Angles

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 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 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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

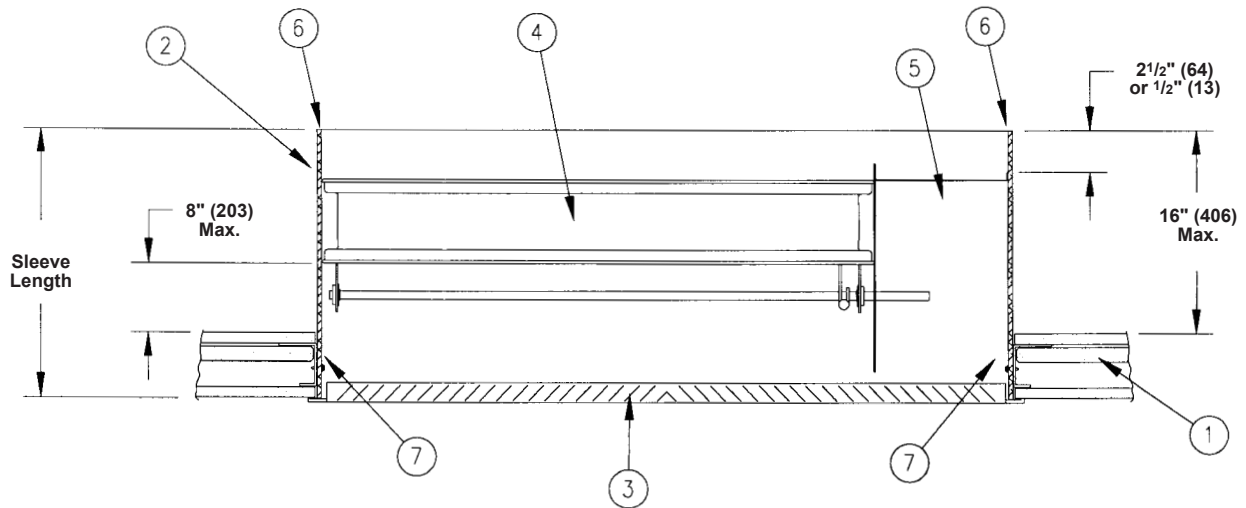
8. Actuator Connections

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

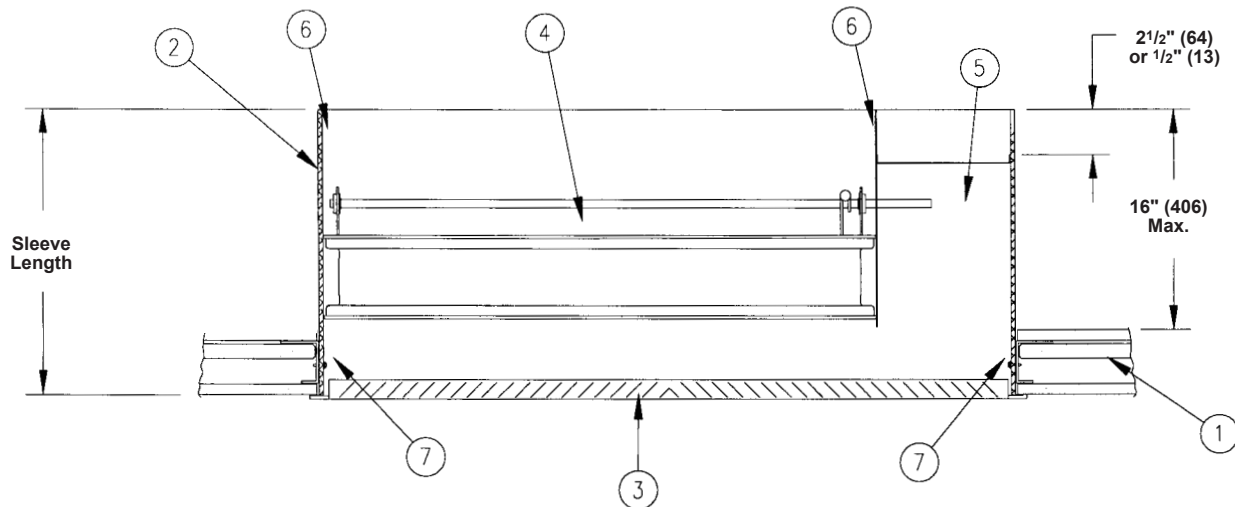
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Lift or handle dampers using the sleeve or frame. Do not lift dampers using the blades or actuators. Dampers and their actuator(s) must be maintained, cycled, and tested in accordance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

FSD60FA, FSD60FA-M, and FSD36FA
Units 36" x 36" and Under



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-M and FSD36FA
Units Above 36" x 36"



FSD36FA and FSD60FA ACTUATOR REPLACEMENT AND WIRING ACCESSIBILITY OPERATIONS INSTRUCTIONS SUPPLEMENT

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

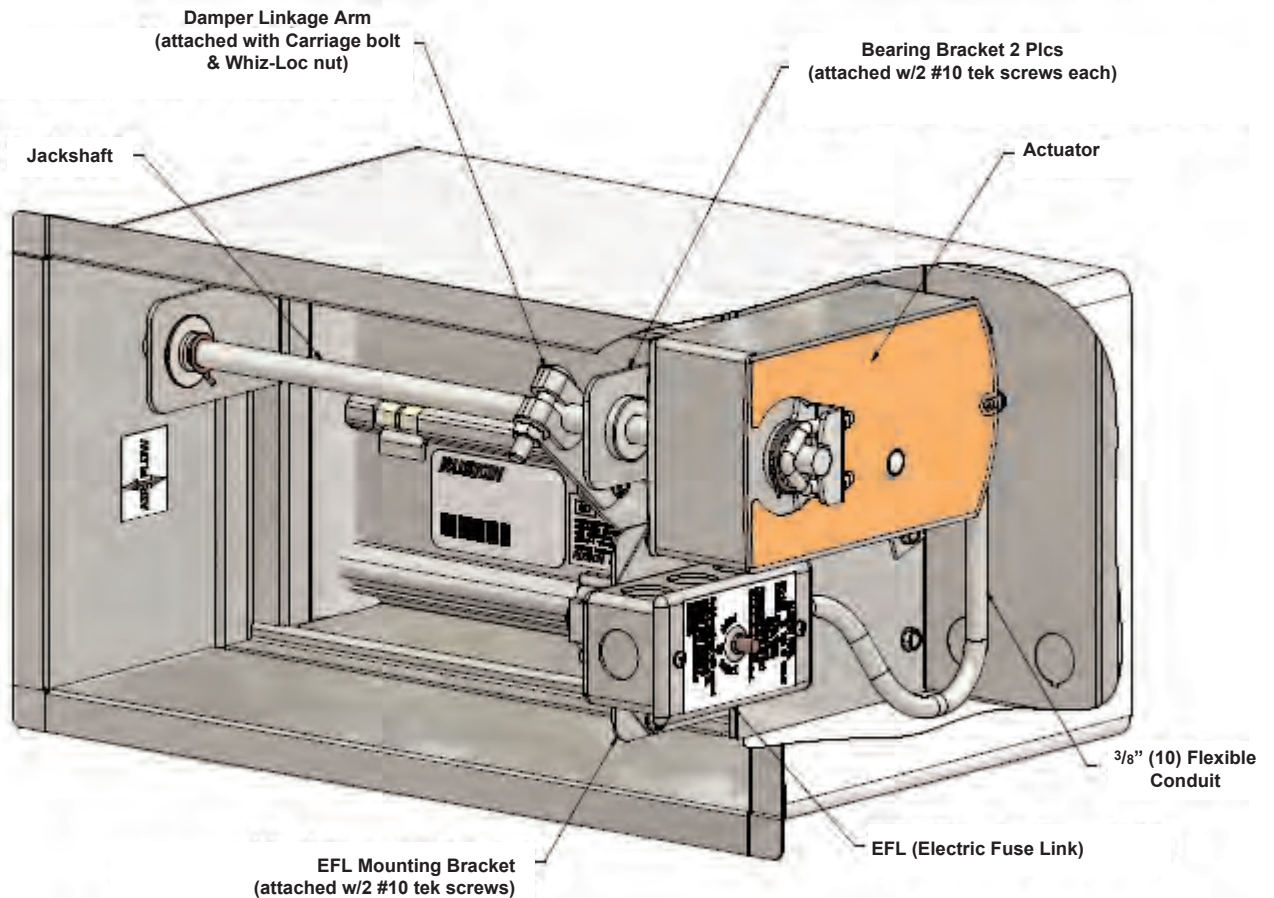
Actuator Assembly Removal

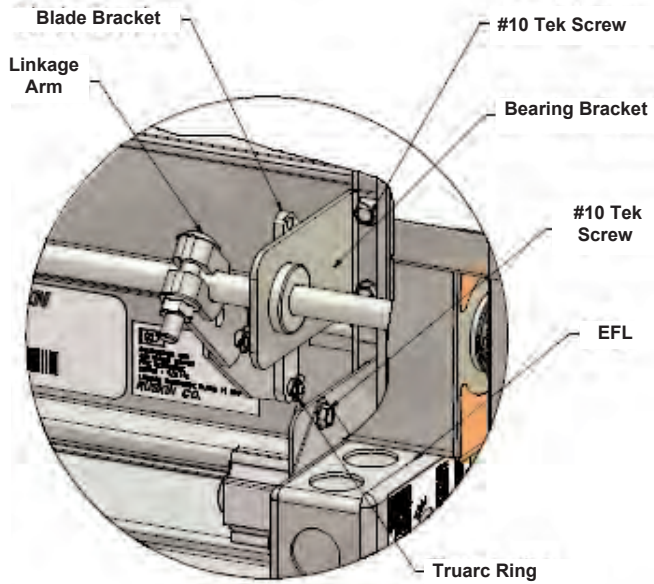
1. Disconnect the power to the EFL (Electronic Fuse Link).
2. Loosen the bolt on the linkage arm.
3. Remove the truarc ring connecting the linkage arm to the blade bracket.
4. Remove the screws from the bearing brackets and the EFL bracket.
(The complete jackshaft assembly with the actuator and EFL will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

To Reinstall the Actuator Assembly

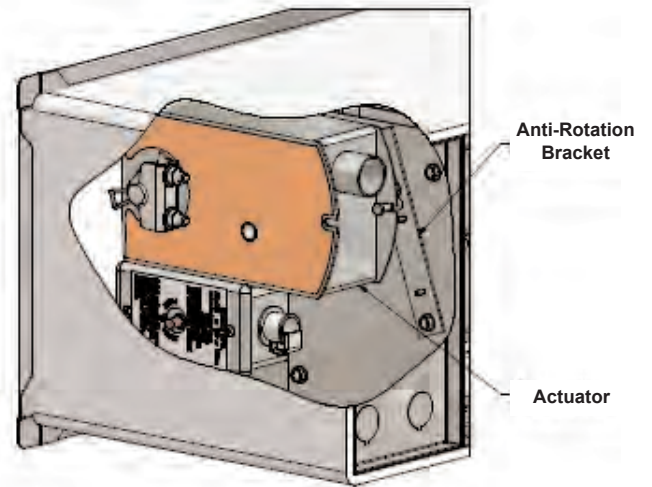
1. Make sure the actuator clamp is tight on to the jackshaft.
2. Slide the jackshaft assembly with the actuator, bearing brackets and the EFL attached to the damper housing.
Caution: When sliding the assembly into the cabinet, make sure the actuator slides onto the pin on the anti-rotation bracket.
3. 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 arc.
6. Reconnect the power.
7. Cycle the damper to verify the damper opens and closes.

Note: Dimensions shown in parentheses () indicate millimeters.

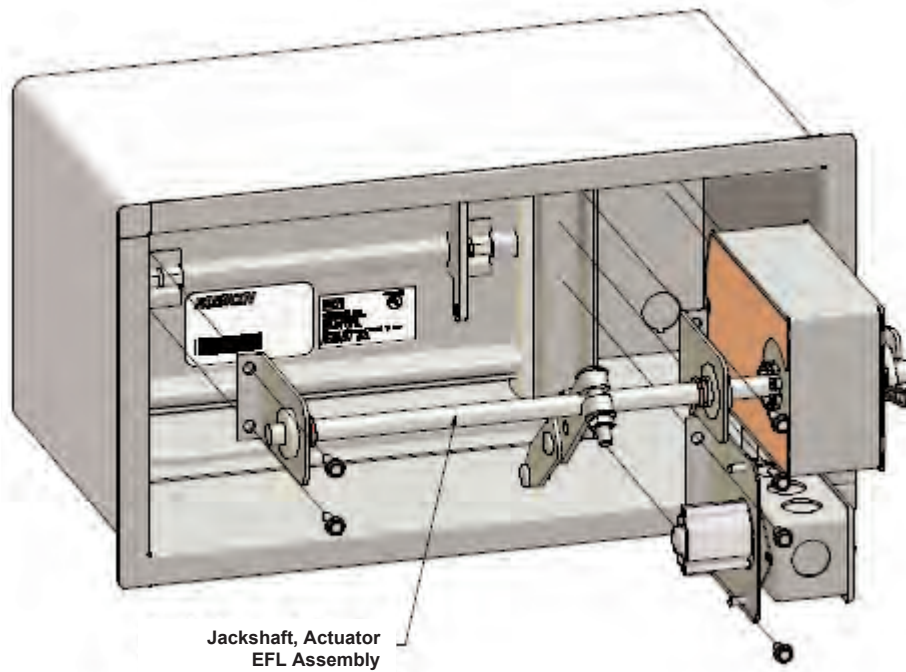




Linkage, Bearing Bracket and EFL Detail



Anti-Rotation Strap Detail



Removal and Installation Detail

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FSDxxGA "Grille Access" COMBINATION FIRE/SMOKE DAMPERS

1½ HOUR UL555

UL555S CLASS I and II



APPLICATION

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.

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

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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)

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

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60GA	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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
FSD60-2GA							2	1 ½
FSD60VGA							2	1 ½
FSD35GA	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge galvanized steel.	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.	3	1 ½
FSD36GA							2	
FSD35SS/GA	5" x 16 gauge (127 x 1.6) stainless steel, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge stainless steel.	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.	3	1 ½
FSD36SS/GA							2	
FSD37SS/GA							1	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
All Models	12"w x 10"h (305 x 254)	36"w x 36"h (914 x 914)	N/A	N/A	N/A

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INSTALLATION INSTRUCTIONS

FSD35GA, FSD36GA, FSD60GA, FSD60-2GA, FSD35SSGA, FSD36SSGA AND FSD37SSGA COMBINATION FIRE AND SMOKE DAMPERS

1½ HOUR UL555 RATED UL555S LEAKAGE RATED CLASS I, II, and III

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

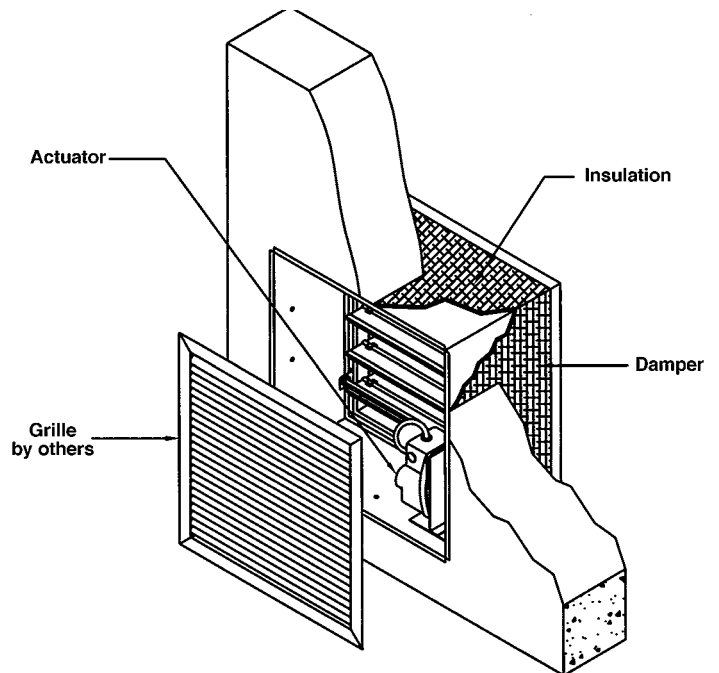
Vertical installation – 32"w x 36"h (813 x 914)

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



SEE COMPLETE MARKING
ON PRODUCT

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 wall-board 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 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 gauge 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 by 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 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).

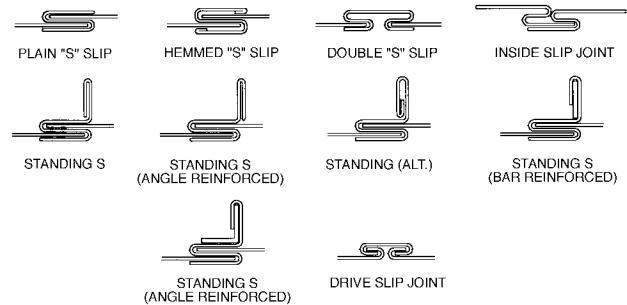
6. Mounting Angles

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 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 detail.

d. Non-Break-Away Duct/Sleeve Connections

If other duct/sleeve connections are 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 (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.

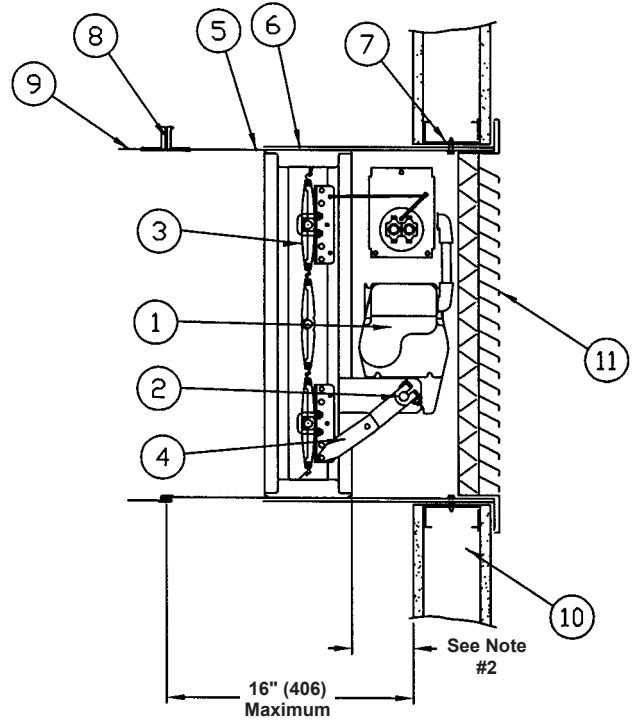
9. Installation and Maintenance

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.

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.



FSDXX/OW "Out of Wall" COMBINATION FIRE/SMOKE DAMPERS

1½ HOUR UL555

UL555S CLASS I



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.

Model FSD60/OW and FSD36/OW series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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)

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
- 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.
- **DSD/DSN** 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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD60/OW	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge 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
FSD60-2/OW							2	1 ½
FSD60V/OW							2	1 ½
FSD35/OW	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge galvanized steel.	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.	3	1 ½
FSD36/OW							2	
FSD35SS/OW	5" x 16 gauge (127 x 1.6) stainless steel, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge stainless steel.	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.	3	1 ½
FSD36SS/OW							2	
FSD37SS/OW							1	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
All Models	8" w x 6" h (195 x 152)	36" w x 36" h (914 x 914)	N/A	N/A	N/A

RUSKIN®



Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

INSTALLATION INSTRUCTIONS

FSD35/OW, FSD36/OW, FSD60/OW, FSD60-2/OW, FSD35SS/OW, FSD36SS/OW, FSD37SS/OW, FSD60V/OW COMBINATION FIRE SMOKE DAMPERS

1½ HOUR UL555 RATED UL555S LEAKAGE RATED CLASS I, II, and III

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)

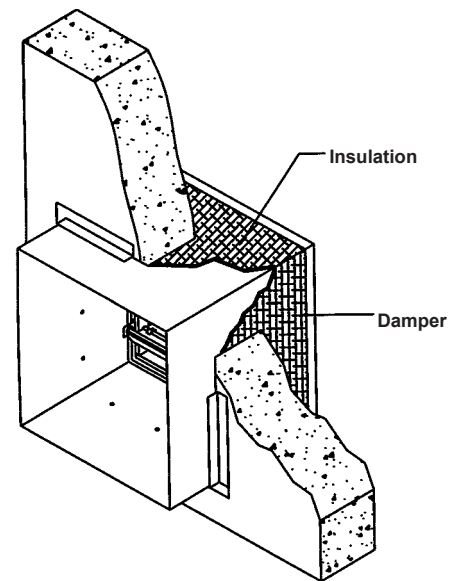
FSD60OW and FSD60-2/OW MAXIMUM UL CLASSIFIED SIZE – OPPOSED BLADE

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 gauge 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 by 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 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

- 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
- 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 1/2" (38).
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).
- 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

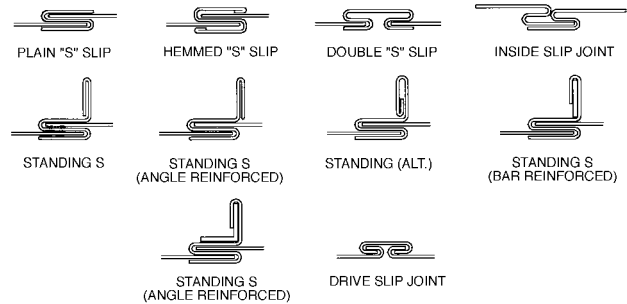
- Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 gauge steel (38 x 38 x 1.0). Ruskin "FAST" angle or only a single conventional mounting angle is required on side opposite of the damper and fastened to the damper sleeve and wall or floor. Do not weld or fasten conventional angles together at the corners of damper.
- 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.
- 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.

- 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, 1 1/2" x 1 1/2" x 20 gauge 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 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 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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

8. Actuator Connection

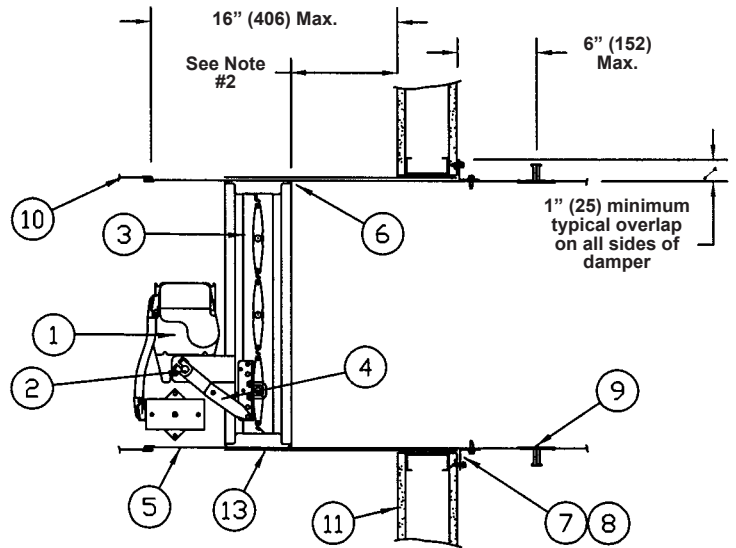
Electric and pneumatic actuators are to be connected in accordance with wiring and piping diagrams developed in compliance with applicable codes, ordinances and regulations.

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

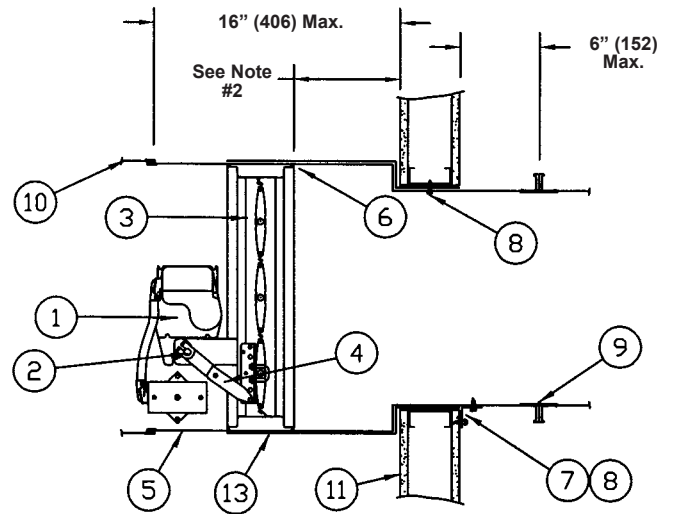
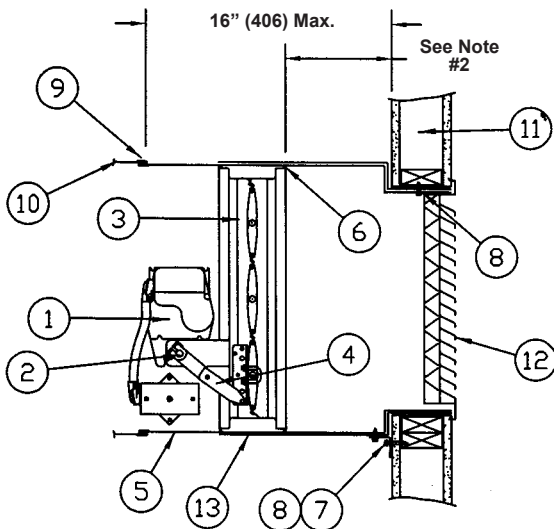
- | ITEM | DESCRIPTION |
|------|--|
| 1. | Actuator (location may vary). |
| 2. | Auxiliary Operating Jackshaft |
| 3. | Damper |
| 4. | Over-Center Link |
| 5. | Sleeve |
| 6. | Caulking Material (may be on either side of damper frame). |
| 7. | Mounting Angle (See Note #6) |
| 8. | Fasteners – (See 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

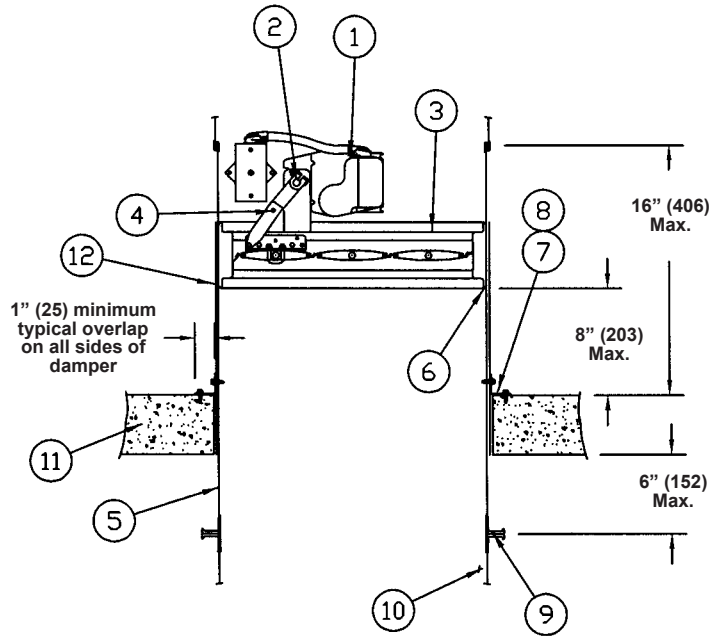
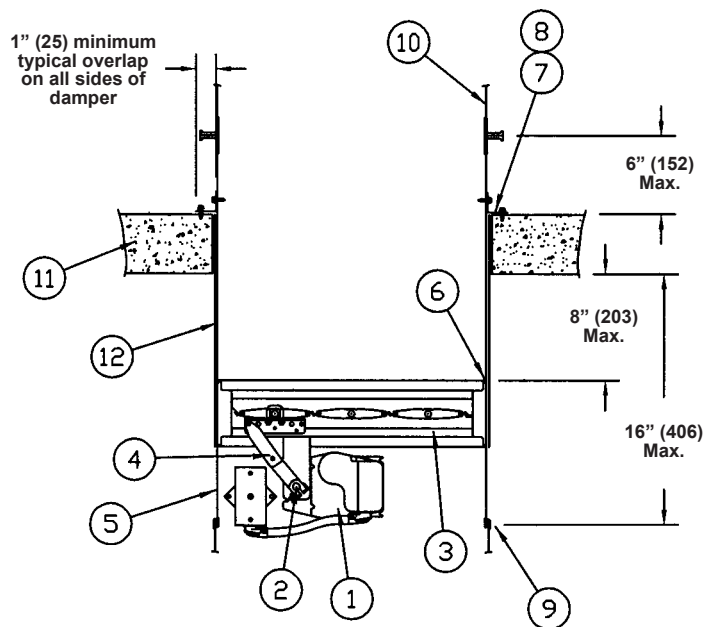
Installation shows the combination fire and smoke damper is larger than the opening in the wall partition with the sleeve penetrating through the partition. These units can be used for a through penetra-

tion or duct termination. Retaining angles are not required but are optional.



HORIZONTAL INSTALLATION

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

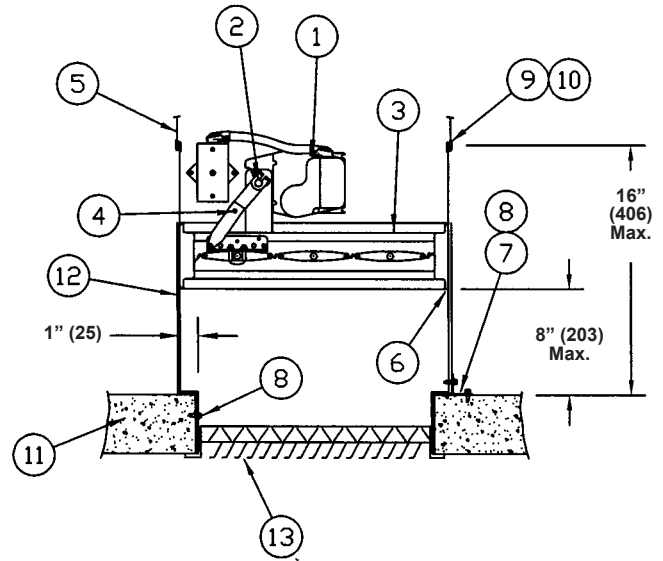
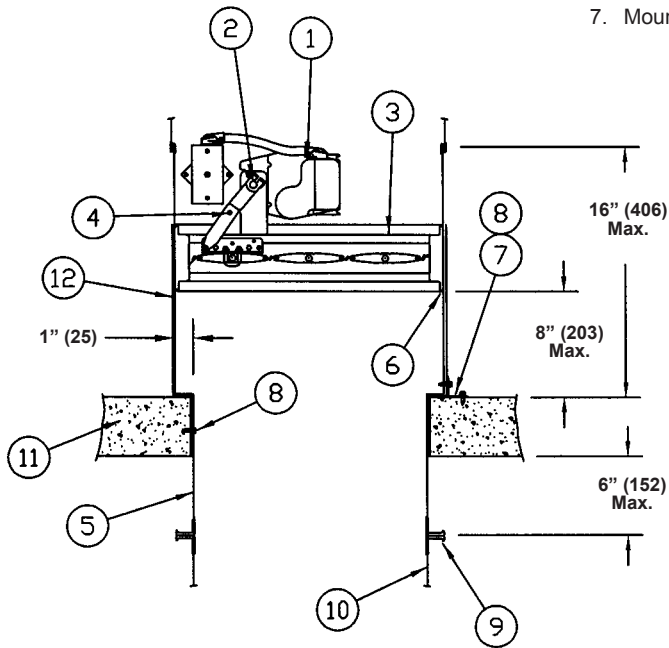



OPTIONAL HORIZONTAL INSTALLATION

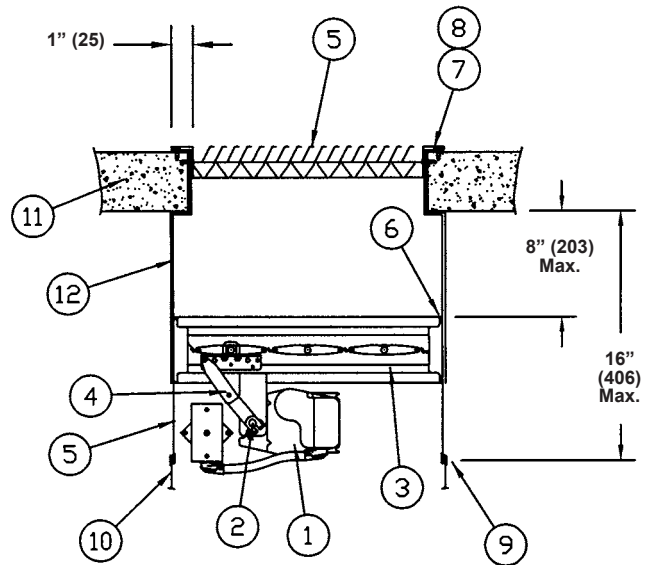
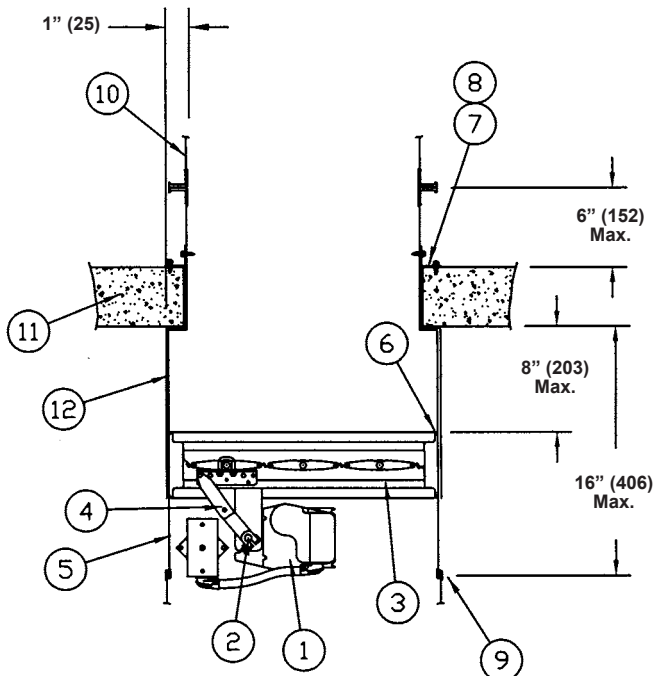
Optional installation shows the combination fire and smoke damper is larger than the opening in the floor with the sleeve penetrating through the floor. These units can be used for a through penetration or duct termination. Retaining angles are not required when the damper is positioned on top of the 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) |

- | ITEM | DESCRIPTION |
|------|---|
| 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

FSD36C and FSD60C CORRIDOR FIRE/SMOKE DAMPER

TUNNEL CORRIDOR APPLICATION

1½ HOUR UL555 RATED

UL555S CLASS I and II



APPLICATION

Ruskin FSD36C and FSD60C are two dampers in one. They are one hour fire rated, UL labeled Corridor Damper and 1½ 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 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. w.g. (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:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **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 airstream) or internal (in airstream) 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.
- **DSD/DSND** 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 gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class	Hourly Rating
FSD36C	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge galvanized steel	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.	2	1 Hour Corridor or 1 ½ Hour Fire/Smoke
FSD60C		One-piece airfoil, 6" (152) wide and 14 (2.0) gauge galvanized steel equivalent thickness.					1	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
FSD36C	8"w x 6"h (203 x 152)	24"w x 24"h (576 x 576)	24"w x 24"h (576 x 576)	N/A	N/A
FSD60C					

RUSKIN®



Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

INSTALLATION INSTRUCTIONS
FSD60C(LP) AND FSD36C(LP) CORRIDOR DAMPER
1½ HOUR UL555 RATED **UL555S CLASS I and II**

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" 1½ hour combination fire/smoke damper in walls or floors (Refer to the FSD60 and FSD36 installation instructions when installing as a "standard" 1½ 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.



SEE COMPLETE MARKING ON PRODUCT

California State Fire Marshal Listing No.

FSD36C – 3225-0245:0122

FSD60C – 3230-0245:0121

APPLICATION ILLUSTRATIONS

**FSD60C(LP) AND FSD36C(LP)
C1 Installation**
Through Penetration of Corridor Ceiling
(Wood or Steel Stud Construction)

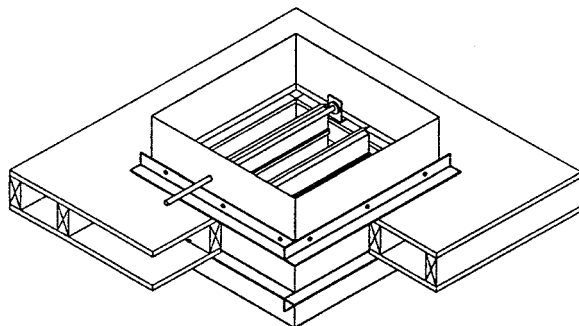


FIG. 1 - ACTUATOR ABOVE RATED CORRIDOR CEILING

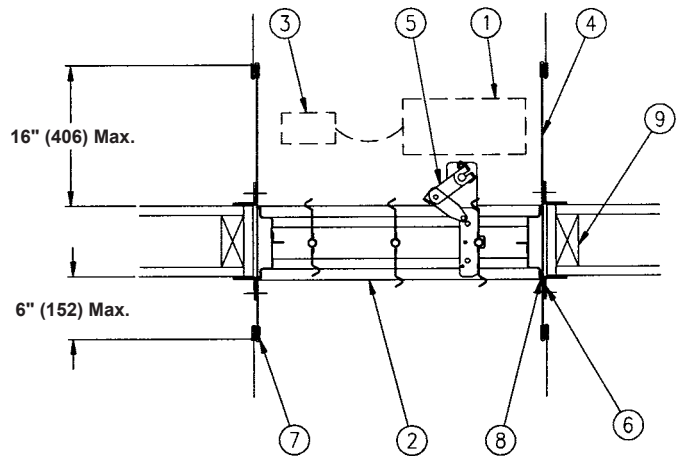
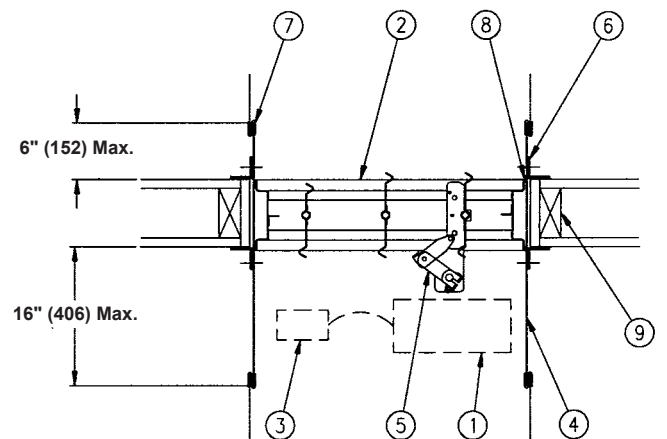


FIG. 2 - ACTUATOR BELOW RATED CORRIDOR CEILING



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)

GENERAL INSTALLATION

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 diffuser 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

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

Sleeve thickness must be equal to or thicker than the duct connected to it. Sleeve gauge 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). 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.

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 1 1/2" x 1 1/2" x 20 gauge (38 x 38 x 1.6) minimum and shall be fastened with minimum no. 10 (M5) bolts or screws, 3/16" (5) minimum diameter steel rivets or 1/2" (13) long tack 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 1 1/2" x 1 1/2" x 20 gauge (38 x 38 x .9) minimum and shall be fastened with minimum no. 10 (M5) bolts or screws, 3/16" (5) minimum diameter steel rivets or 1/2" (13) long tack 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 2 1/2" x 16 gauge (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 steel rivets or 1/2" (13) long tack 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 15/8" (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

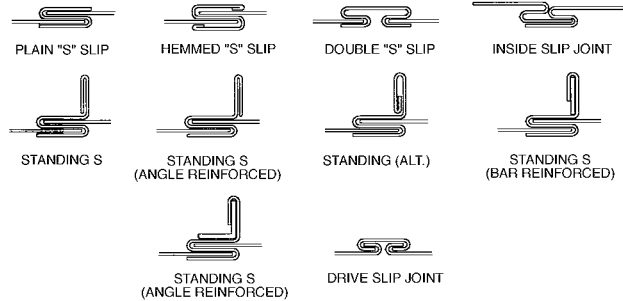
Rectangular ducts must use one or more of the connections depicted below:

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 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 System Breakaway Connections Supplement.

TDC and TDF roll-formed flanged connections using 3/8" (10) steel bolts, nuts, and metal cleats as depicted and 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 gauge (1.6) for dampers up to 36" (914) wide and 24" (610) high and 14 gauge (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.

ILLUSTRATIONS (CON'T)

**FSD60C AND FSD36C
C2 Installation
V-Frame Grille Application
(Wood or Steel Stud Construction)**

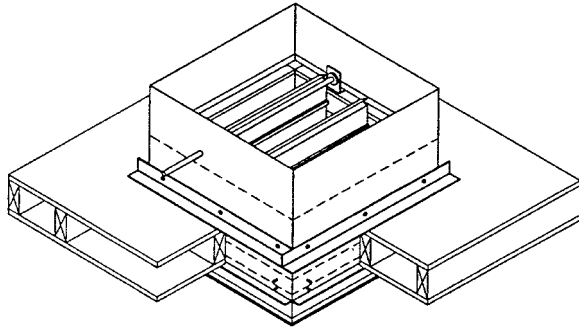
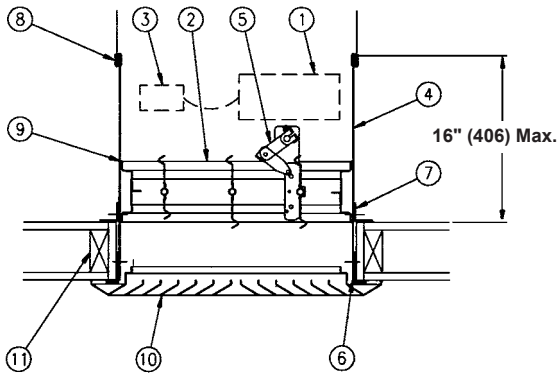
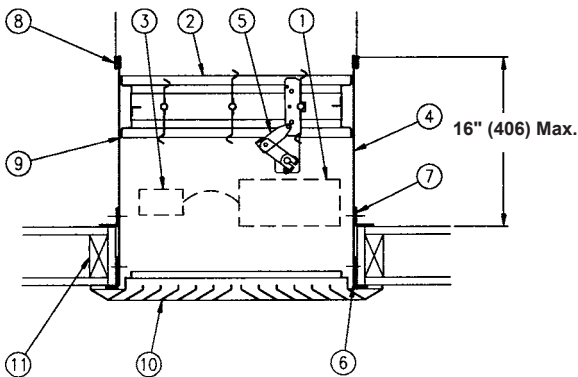


FIG. 3 - DAMPER WITH ACTUATOR MOUNTED EXTERNALLY



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



- | 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. |

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

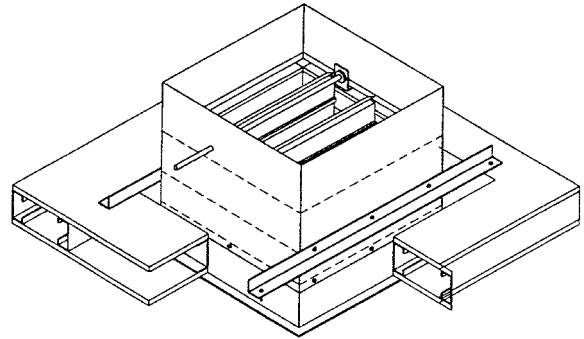
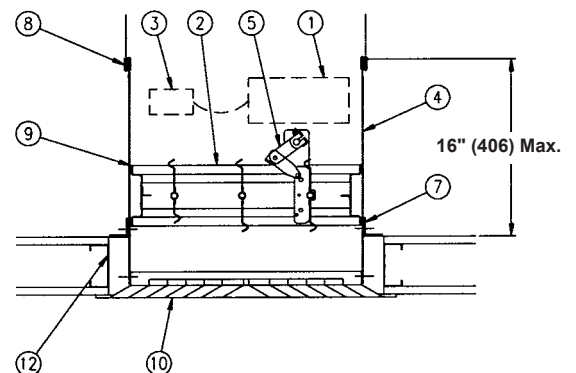
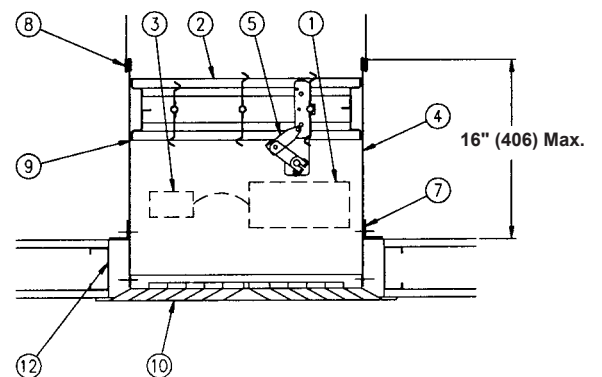


FIG. 5 - DAMPER WITH ACTUATOR MOUNTED EXTERNALLY



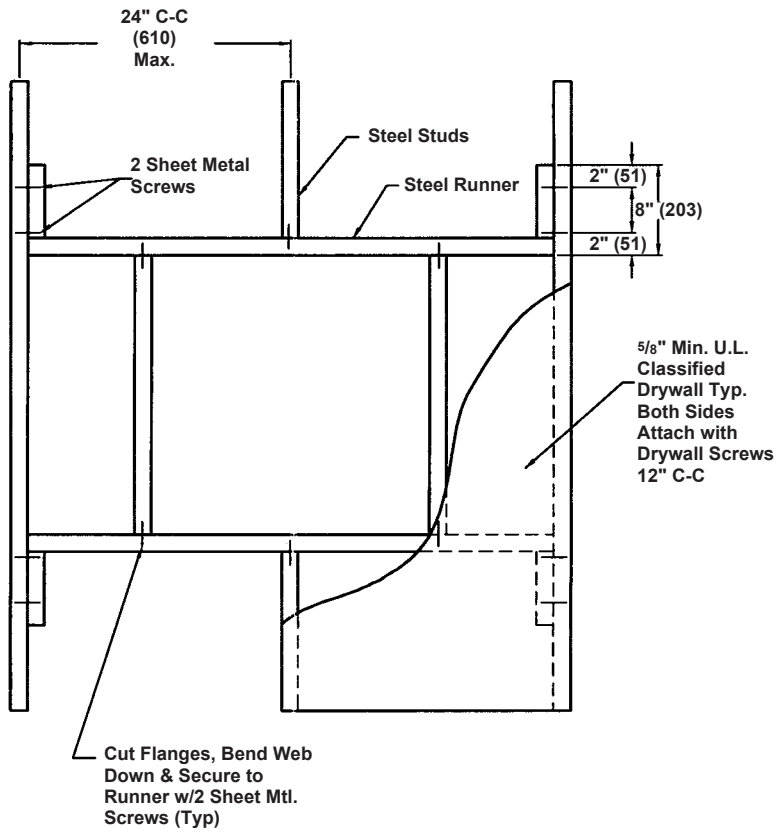
**FIG. 6 - DAMPER WITH ACTUATOR MOUNTED INTERNALLY
(Allows access to the actuator through the diffuser)**



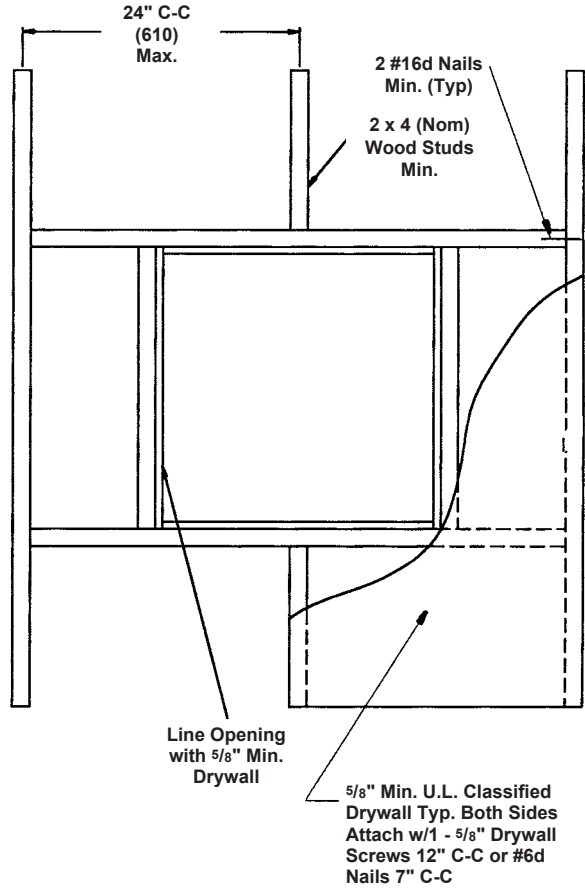
- | ITEM | DESCRIPTION |
|------|---|
| 7. | Mounting Angles 1 1/2 x 1 1/2 x 16 gauge min. |
| 8. | Joint, Sleeve to Duct – Break-Away Connections |
| 9. | Caulking Material |
| 10. | Steel Grille/Diffuser (by others) |
| 11. | Steel or Wood Stud Construction (single studs only) |
| 12. | Steel Construction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

FRAMING DETAILS (STANDARD)

Steel Stud Construction



Wood Stud Construction



3900 Dr. Greaves Rd.
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 www.ruskin.com

FSDR60C AND FSDR25C COMBINATION FIRE/SMOKE DAMPERS

TRUE ROUND ULTRA-LOW LEAKAGE CORRIDOR TUNNEL APPLICATION

1½ HOUR UL555

UL555S CLASS I



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 a 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. w.g. (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 gauges to ensure field compliance with UL installation requirements.

Model FSDR60C series meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3235-0245:0128) FSDR25(SS)
Listing (#3235-0245:0120) FSDR25C
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Blade Seal	Leakage Class	Hourly Rating
FSDR25C FSDR60C	20 gauge (.9) galvanized steel. Standard 17" (432) long	Two-piece 14 gauge (1.9) equivalent thickness galvanized steel.	Stainless steel sleeve type, pressed into frame	Silicone edge type sandwiched between two piece blade. Full circumference smoke seal to 450°F (232°C).	1	1

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
FSDR60C, FSDR25C	6" Dia. (152)	24" Dia. (609)

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INSTALLATION INSTRUCTIONS MODEL FSDR60C ROUND CORRIDOR DAMPER CLASSIFIED UL555 1 HOUR UL555S CLASS I

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 gauge 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

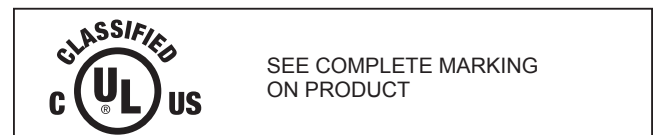
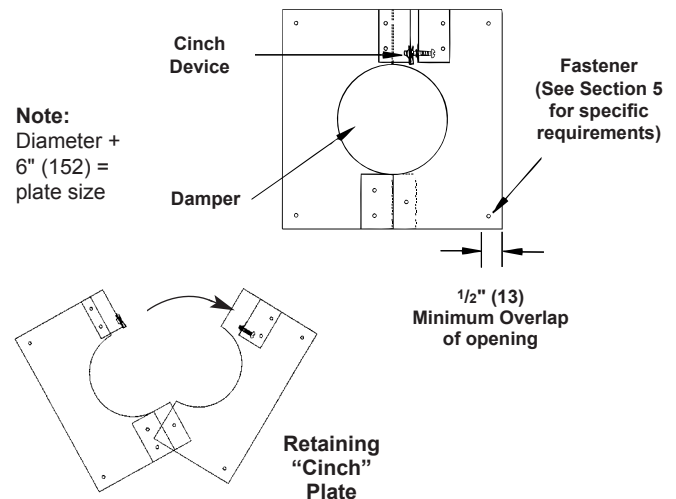
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:

- 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

RETAINING "CINCH" PLATE



GENERAL INSTALLATION

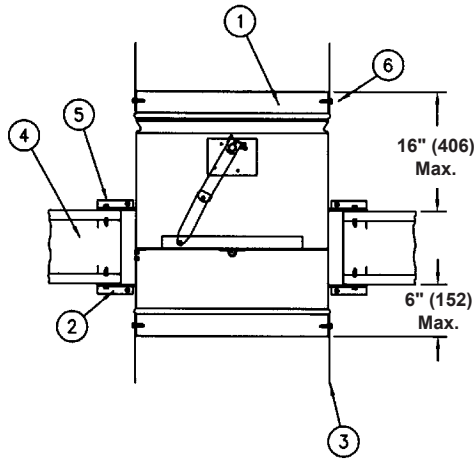


Figure 1

- | 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.

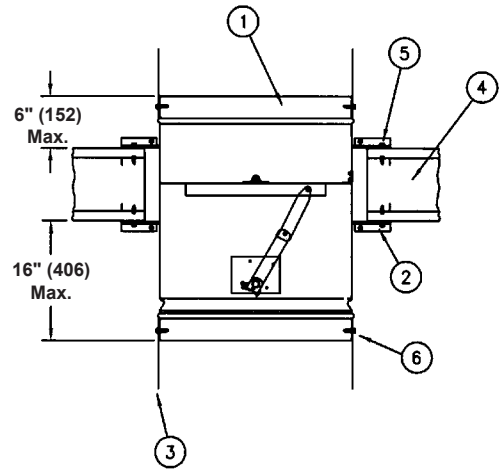
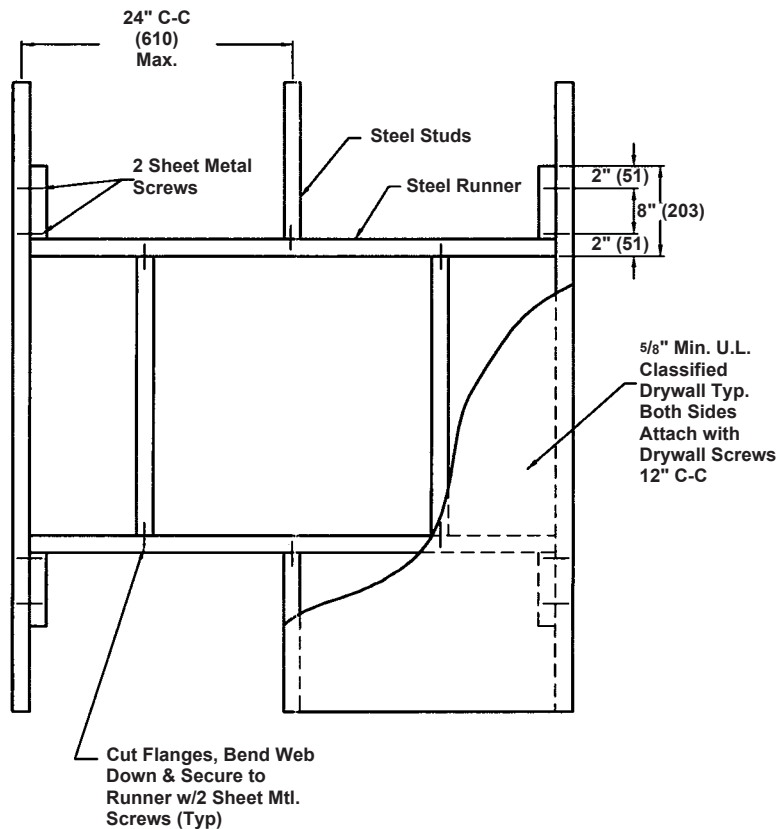


Figure 2

FRAMING DETAILS

Steel Stud Construction



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www.ruskin.com

INSTALLATION INSTRUCTIONS

MODEL FSDR25C and FSDR25SSC ROUND CORRIDOR DAMPER

CLASSIFIED UL555 1 HOUR UL555S CLASS I

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 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 gauge 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 Polymeric – 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

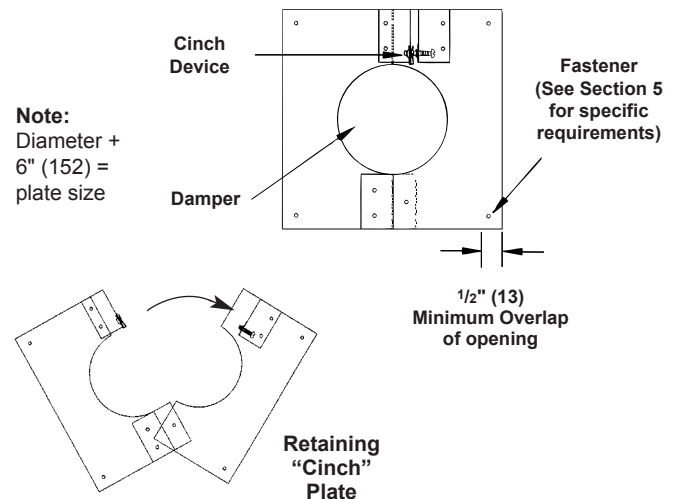
Refer to the appropriate Ruskin installation instructions supplements for additional information or special requirements:

- 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

RETAINING "CINCH" PLATE



SEE COMPLETE MARKING ON PRODUCT

GENERAL INSTALLATION

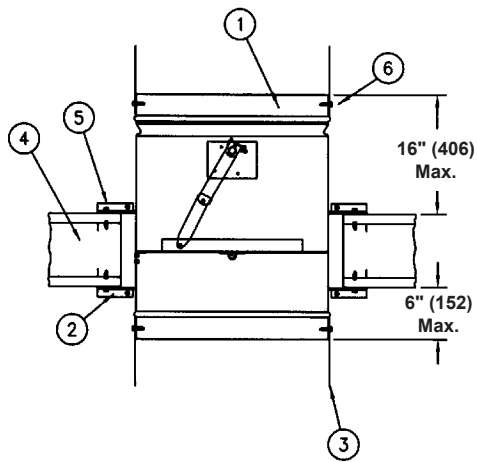


Figure 1

- | 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.

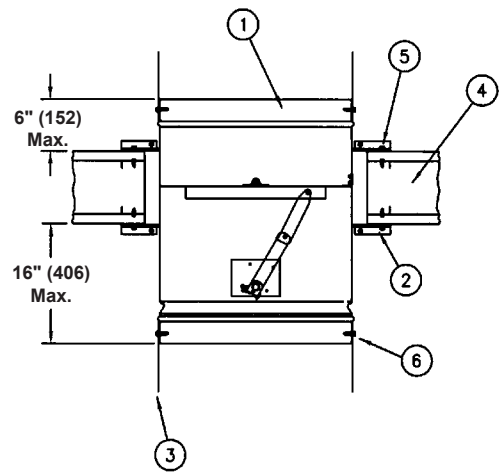
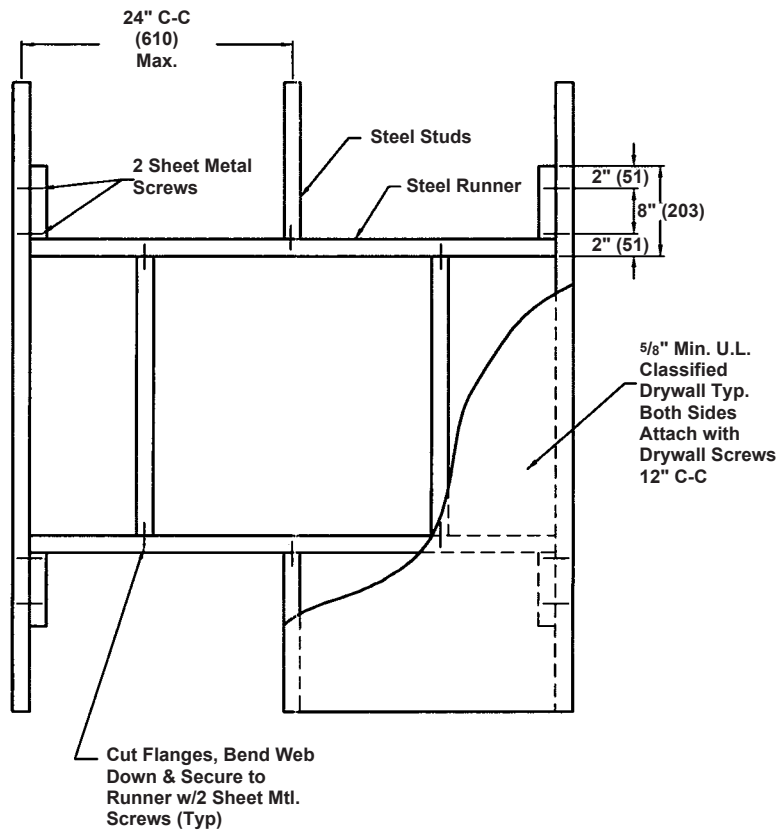


Figure 2

FRAMING DETAILS

Steel Stud Construction



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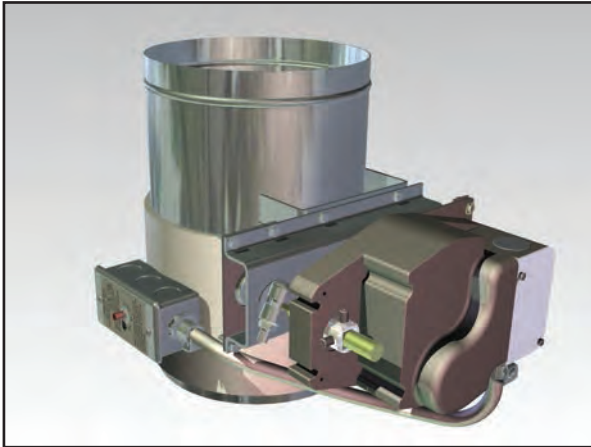
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(816) 761-7476
FAX (816) 765-8955
www.ruskin.com

DFSDR1 CORRIDOR FIRE SMOKE DAMPER

LAY-IN DIFFUSER CORRIDOR DAMPER

1 HOUR UL555 RATED

UL555S CLASS I



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).

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

- **National Fire protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building codes**
- **CSFM california State Fire Marshal**
Listing (#3235-0245:0114)
- **New York City** (MEA 252-05-E)

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 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

Damper	Frame	Blades	Bearings	Blade Seal	Leakage Class	Hourly Rating
DFSDR1	20 gauge (1.0) galvanized steel 12" (305) long	Two piece 14 gauge (1.9) equivalent thickness galvanized steel.	Stainless steel sleeve type, pressed into frame	Silicone edge type sandwich between two piece blades. Full circumference smoke seal to 450°F (232°C).	1	1 Hour Corridor

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
DFSDR1	6" Dia. (152)	12" Dia. (305)

RUSKIN®



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INSTALLATION INSTRUCTIONS MODEL DFSDR1 ROUND CORRIDOR DAMPER 1 HOUR UL555 CLASSIFIED

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 gauge (.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 gauge (.9) sleeve is integral to the damper and shall be equal to or heavier than the gauge 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 gauge (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 gauge 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

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.

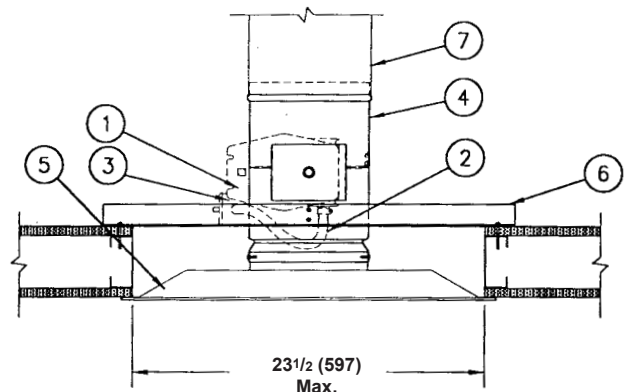
INSTALLATION SUPPLEMENTS

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

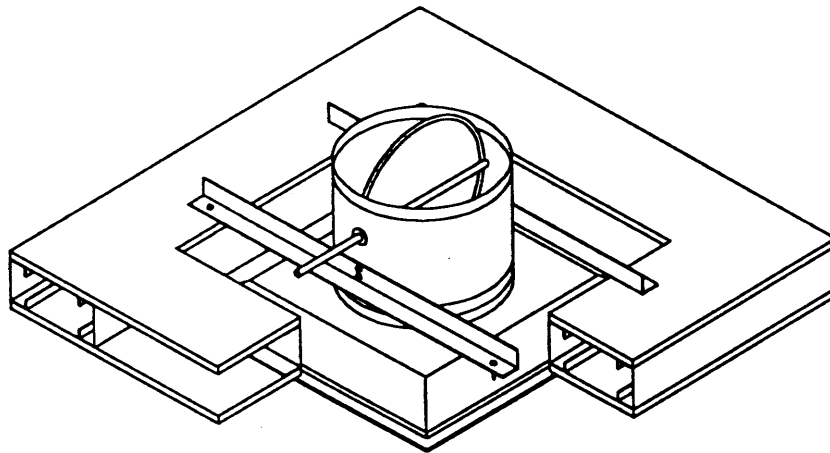
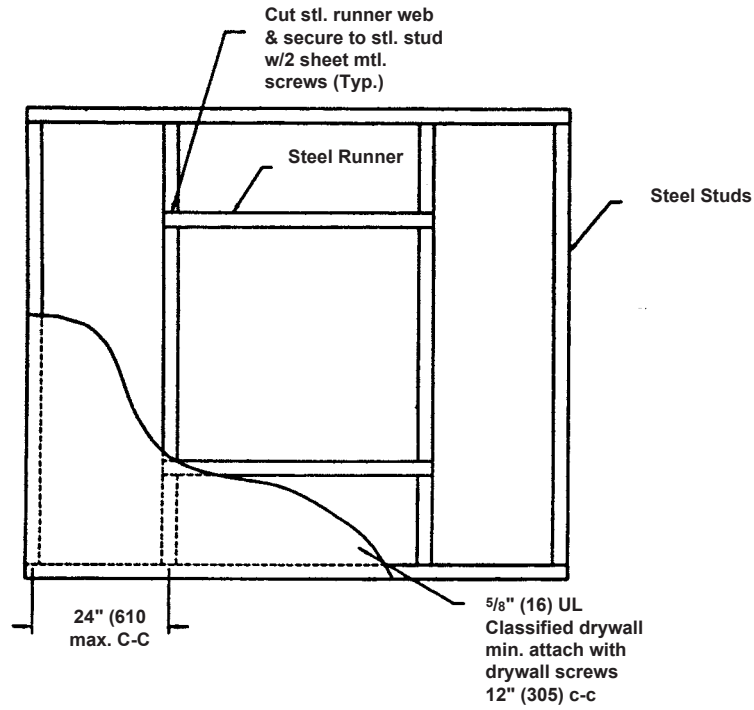
1. Actuator (location may vary)
2. Flex Conduit
3. TS150 FireStat, EFL (electric fuse link) or PFL (pneumatic fuse link) (**location may vary**)
4. Integral Sleeve Damper Frame
5. Steel Surface Mount Ceiling Diffuser (**supplied by others**)
6. Mounting Angles and Fasteners
7. Duct (Flexible or Hard)



California State Fire Marshal Listing No. 3225-0245:0101.

California State Fire Marshal Listing No. 3230-0245:0114.

STEEL STUD CONSTRUCTION



SMOKE DAMPERS

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:

MAXIMUM LEAKAGE IN CFM/SQ. FT.			
Leakage Class	@4" w.g.	@8" w.g.	@12" w.g.
Class I	8	11	14
Class II	20	28	35
Class III	80	112	140

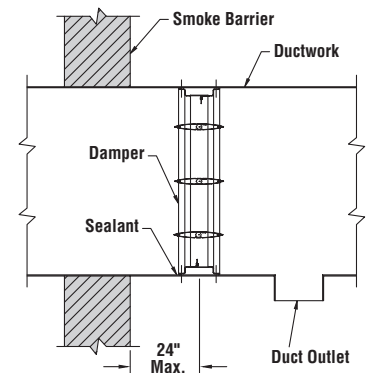
HVAC system designers are advised to select the lowest leakage class damper. However, there are some smoke control applications when a higher leakage class damper is acceptable.

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 (10.2 m/s) @ 4" w.g. (1.0 kPa) and 250°F (121°C). 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.

Smoke Damper Installation

The smoke damper must be installed no more than 24" from the smoke barrier it is intended to protect.

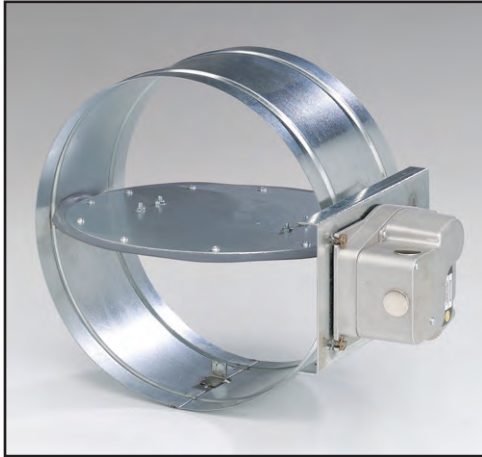


SMOKE DAMPERS MODELS							
MODEL	HOURLY RATING	LEAKAGE CLASS	BLADE TYPE/ DESCRIPTION	MAXIMUM VELOCITY* (FPM)	MAXIMUM PRESSURE* (IN. W.G.)	MAXIMUM ASSEMBLY TEMP. (°F)*	
Standard							
SD50	NA	I	Airfoil	2000	4	350	
SD60	NA	I	Airfoil	4000	4	350	
SD60V	NA	II	Airfoil	2000	4	350	
SD60-2	NA	II	Airfoil	4000	4	350	
SD37	NA	I	V-Groove	2000	4	350	
SD36	NA	II	V-Groove	2000	4	350	
SD35	NA	III	V-Groove	2000	4	350	
True Round							
SDRS25	NA	I	True Round	2000	4	350	
Stainless Steel							
SD37SS	NA	I	V-Groove	2000	4	350	
SD36SS	NA	II	V-Groove	2000	4	350	
SD35SS	NA	III	V-Groove	2000	4	350	
SDRS25SS	NA	I	True Round	2000	4	350	
Modulating & Balancing							
SD60M	NA	I	Airfoil	2000	4	250	
SD60-BAL	NA	I	Airfoil	2000	4	250	
Fan Isolation							
SD102	NA	II	Airfoil	2000	6	250	

SDRS25 and SDRS25SS SMOKE DAMPERS

TRUE ROUND ULTRA-LOW LEAKAGE

UL555S CLASS I LEAKAGE



APPLICATION

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. w.g. (1 kPa).

Model SDRS series meets the requirements for smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** - Listing (3230-0245:0108)
- **New York City** (MEA 252-05-E)

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.

SPECIFICATIONS

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

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
SDRS25, SDRS25SS	6" Dia. (152)	24" Dia. (609)

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SD50 ALUMINUM SMOKE DAMPER

HIGH PERFORMANCE/ULTRA-LOW UL555S CLASS I LEAKAGE



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. w.g. (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.

Model SD50 series meets the requirements for smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3230-0245:0130)
- **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.
- 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.
- **DSD/DSND** 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 gauges to ensure field compliance with UL installation requirements.

SPECIFICATIONS

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

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
SD50	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	144"w x 96"h (3658 x 2438) 288"w x 48"h (7315 x 1219) 72"w x 192"h (1829 x 4877)

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

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SD60 and SD60-2 GALVANIZED SMOKE DAMPERS

HIGH PERFORMANCE/ULTRA-LOW LEAKAGE UL555S CLASS I and II LEAKAGE



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. w.g. (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.

Model SD60 series meets the requirements for smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3230-0245:0131)
- **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.
- 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 airstream) or internal (in airstream) mounting location.

OPTIONS

- **FM Approvals** as Specification Tested Product.
- **DTS** (Damper Test Switch) test switch for cycle testing.
- **DSD/DSN** 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 gauges to ensure field compliance with UL installation requirements.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class
SD60	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil nominal 6" (152) wide and 14 (2.0) gauge 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) mechanically fastened to the blade edge.	Concealed in frame.	1
SD60-2							2

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
SD60	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	144"w x 96"h (3658 x 2438)
SD60-2			288"w x 48"h (7315 x 1219) 72"w x 192"h (1829 x 4877)

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

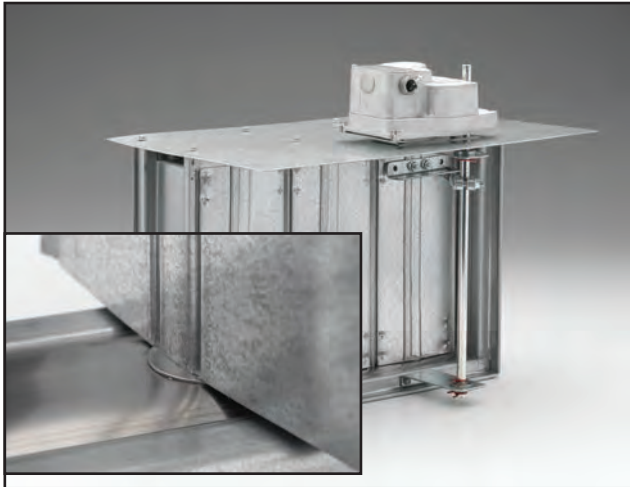
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SD60V VERTICAL BLADE SMOKE DAMPER

**HIGH PERFORMANCE/ULTRA-LOW LEAKAGE
UL555S CLASS II LEAKAGE**



APPLICATION

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. w.g. (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.

Model SD60V series meets the requirements for smoke dampers established by:

- **National Fire Protection Association NFPA Standards 80, 90A, 92A, 92B, 101 and 105.**
- **ICC International Building Codes**
- **CSFM California State Fire Marshal Listing (#3230-0245:0131)**
- **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.
- 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 airstream) or internal (in airstream) 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 gauges to ensure field compliance with UL installation requirements.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class
SD60V	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil nominal 6" (152) wide and 14 (2.0) gauge 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) mechanically fastened to the blade edge.	Concealed in frame.	2

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
SD60V	6"w x 8"h (152 x 203)	48"w x 36"h (1219 x 914)	N/A

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

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SD35, SD36 and SD37 SMOKE DAMPERS

UL555S CLASS I, II, and III LEAKAGE



APPLICATION

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 in. 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.

Model SD36 series meets the requirements for smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3230-0245:0131)
- **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.
- 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 airstream) or internal (in airstream) mounting location.

OPTIONS

- **FM Approvals** as Specification Tested Product.
- **DTS** (Damper Test Switch) test switch for cycle testing.
- **DSD/DSND** 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 gauges to ensure field compliance with UL installation requirements.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class
SD35	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	16 (1.6) gauge galvanized steel, triple V-Groove shaped.	Stainless steel sleeve type, pressed into frame	Stainless steel flexible metal compression type.	N/A	Concealed in frame.	3
SD36					Silicone edge type for smoke seal to 450°F (232°C) mechanically fastened to the blade edge.		2
SD37							1

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
SD35	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	144"w x 96"h (3658 x 2438)
SD36			288"w x 48"h (7315 x 1219)
SD37			72"w x 192"h (1829 x 4877)

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

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SD35SS, SD36SS and SD37SS STAINLESS STEEL SMOKE DAMPERS

UL555S CLASS I, II, and III LEAKAGE



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 airstream) or internal (in airstream) mounting location.

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 in. 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:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3230-0245:0131)
- **New York City** (MEA 252-05-E)

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 gauges to ensure field compliance with UL installation requirements.

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class
SD35SS	5" x 16 gauge (127 x 1.6) stainless steel, single piece, hat-shaped channel	16 (1.6) gauge stainless steel, triple V-Groove shaped.	Stainless steel sleeve type, pressed into frame	Stainless steel flexible metal compression type.	N/A	Concealed in frame.	3
SD36SS					Silicone edge type for smoke seal to 450°F (232°C) mechanically fastened to the blade edge.		2
SD37SS							1

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
SD35	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	144"w x 96"h (3658 x 2438)
SD36			288"w x 48"h (7315 x 1219) 72"w x 192"h (1829 x 4877)
SD37	12"w x 6"h (305 x 152)	24"w x 32"h (610 x 813)	192"w x 32"h (4877 x 813) 96"w x 64"h (2438 x 1626) 48"w x 128"h (1219 x 3251)

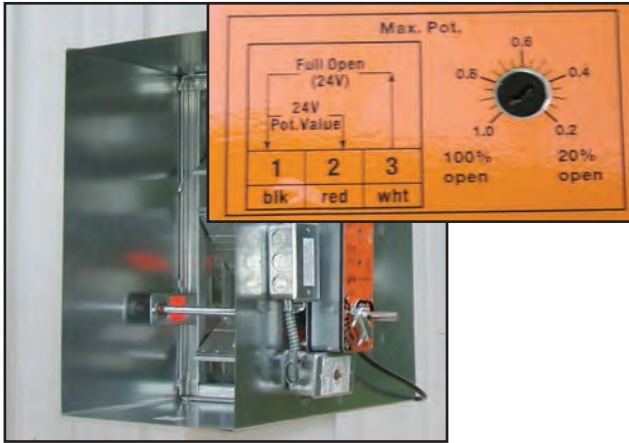
*Sizes listed above are for ratings of 2000 fpm (10.2 m/s) and 4 in. wg (1 kPa)

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SD60M SMOKE DAMPERS
HIGH PERFORMANCE/ULTRA-LOW LEAKAGE
UL555S CLASS I LEAKAGE



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.

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 airstream) or internal (in airstream) mounting location.

OPTIONS

- **FM Approvals** as Specification Tested Product.
- **DTS** (Damper Test Switch) test switch for cycle testing.
- **DSEF/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 gauges to ensure field compliance with UL installation requirements.

Model SD60M and SD60-BAL meets the requirements for dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** - Listing (#3230-0245:0131)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Jamb Seal	Blade Seal	Linkage	Leakage Class
SD60M	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge galvanized steel.	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

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
		Vertical or Horizontal	Vertical or Horizontal**
SD60M	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	120"w x 48"h (3048 x 1219) Or 64"w x 96"h (1626 x 2438)



Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)



INSTALLATION INSTRUCTIONS

SMOKE DAMPERS

**MODELS SD35, SD36, SD37, SD50, SD60(M), SD60-2, SD60V, SD35SS, SD36SS, SD37SS, SDRS25(M), SDRS25SS(M) and TFD30
UL555S LEAKAGE RATED CLASS I, II, and III**

APPLICATION

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)

Dimensions shown in parentheses () indicate millimeters.

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)

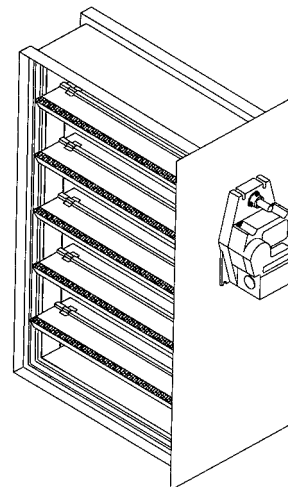
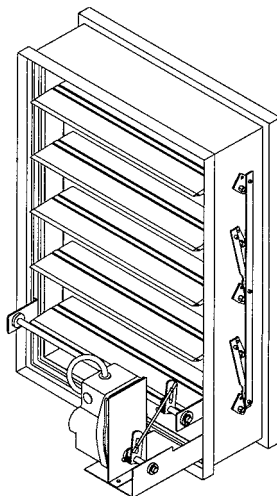
SDRS25(M) and SDRS25SS(M) MAXIMUM UL CLASSIFIED SIZES –

- Single Section (only) Vertical or Horizontal Installation – 24" (610) diameter.

TFD30 MAXIMUM UL CLASSIFIED SIZE -

OPPOSED BLADES

- Single Section (only) Vertical or Horizontal Installation - 39.37"w x 39.37"h (1000 x 1000)



SEE COMPLETE
MARKING ON PRODUCT

1. Location of Damper in Ductwork

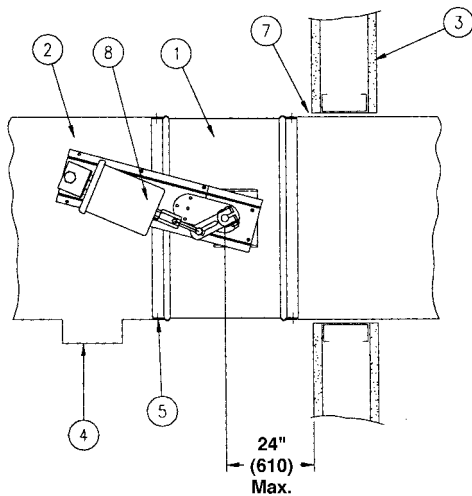
Smoke Dampers must be placed in the ductwork so the closed blades are within 24" (610) of the smoke barrier and before any duct inlets or outlets (access doors not included).

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.



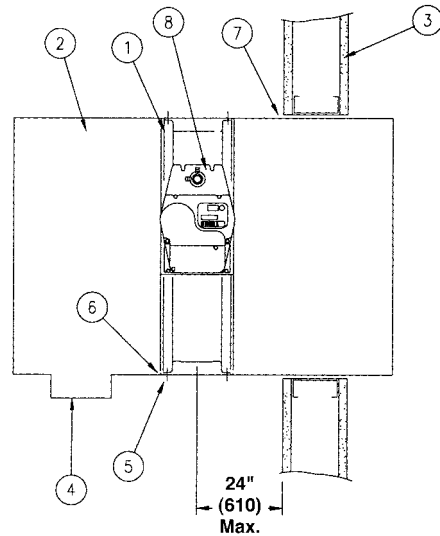
SDRS25 and SDRS25SS
Single Blade Round Smoke Damper
Installed within a Duct or Sleeve

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).

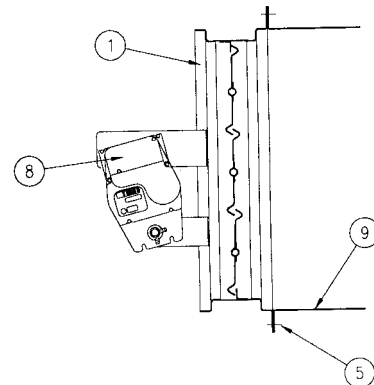
5. Installation and Maintenance

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.



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

ITEM	DESCRIPTION
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

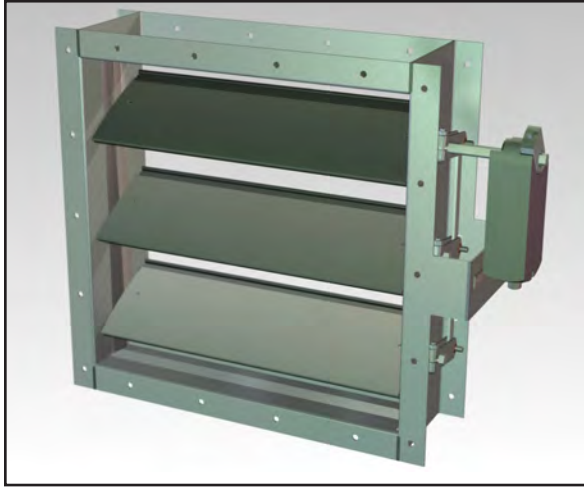


SD35, SD36, SD37, SD50, SD60, SD60-2
SD35SS, SD36SS and SD37SS
Multiple Blade Smoke Damper
Installed within a Flanged Frame or Flanged Sleeve



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Kansas City, MO 64030
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www.ruskin.com

SD102 SMOKE DAMPERS HIGH PERFORMANCE/LOW LEAKAGE UL555S CLASS II LEAKAGE



APPLICATION

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 in. w.g. (1.5 kPa), but is constructed and tested for velocities as high as 5,000 fpm and pressures as high as 24 in. w.g. (6 kPa).

Model SD102 meets the requirements for smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**

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.

SPECIFICATIONS

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

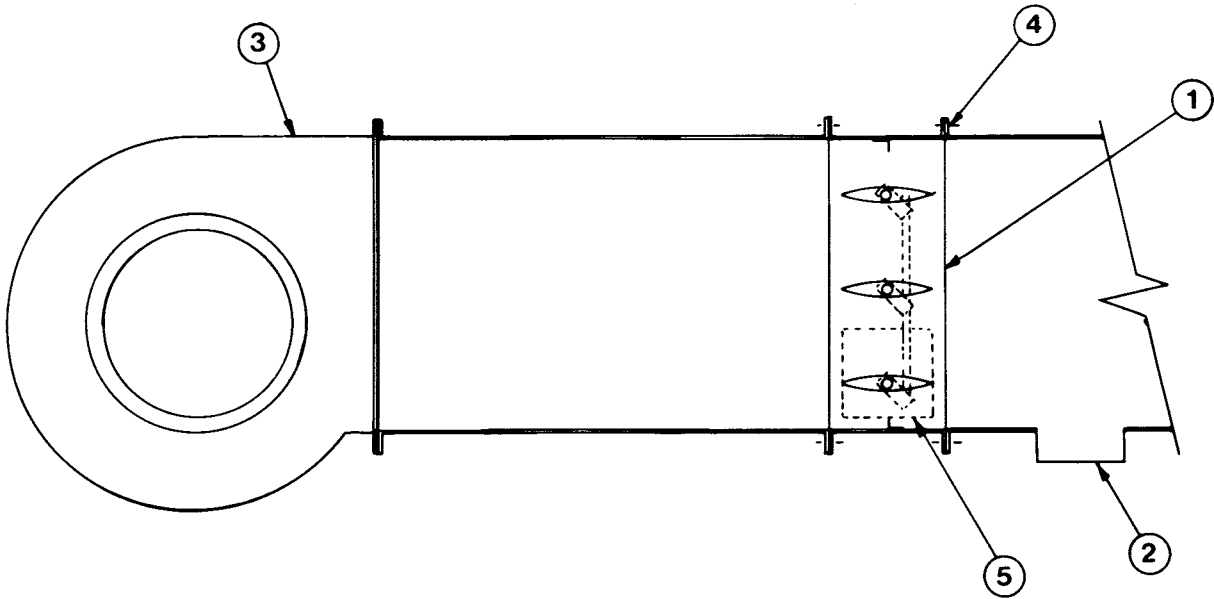
MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section	Maximum Multiple Section*
SD102	12"w x 6"h (305 x 152)	36"w x 48"h (914 x 1219)	72"w x 48"h (1829 x 1219)

RUSKIN®



INSTALLATION INSTRUCTIONS LEAKAGE RATED DAMPERS MODEL SD102



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

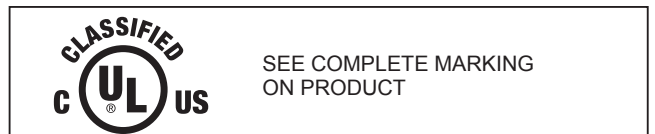
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Ruskin recommends that each smoke damper be maintained, cycled and tested every six months and in accordance with the latest editions of NFPA90A, 92A, UL864, local codes and in accordance 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 $\frac{3}{8}$ " (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.

Note: Dimensions shown in parentheses () indicate millimeters.

ITEM	DESCRIPTION
1.	Damper Frame
2.	Duct Outlet
3.	Fan
4.	$\frac{3}{8}$ " (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).



FIRE DAMPERS

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.

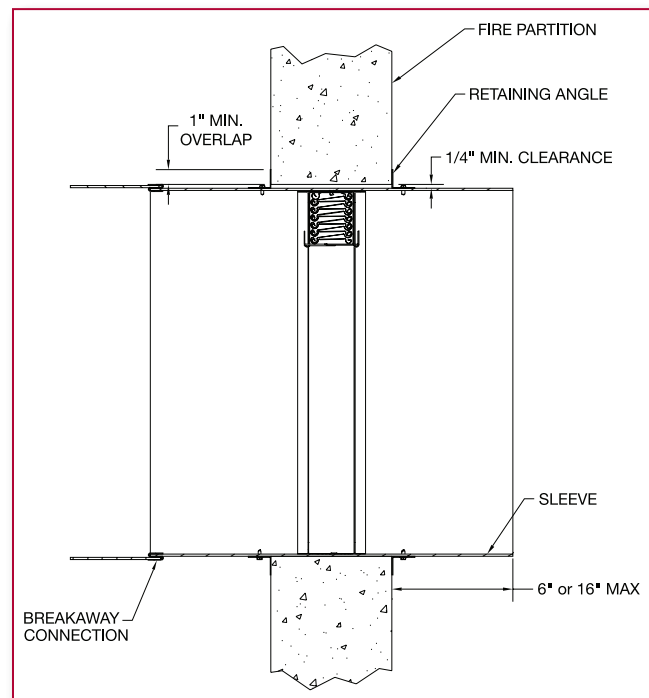


Curtain Type Fire Damper



Multiple Blade Fire Damper

Typical Fire Damper Installation (Fast Angle)



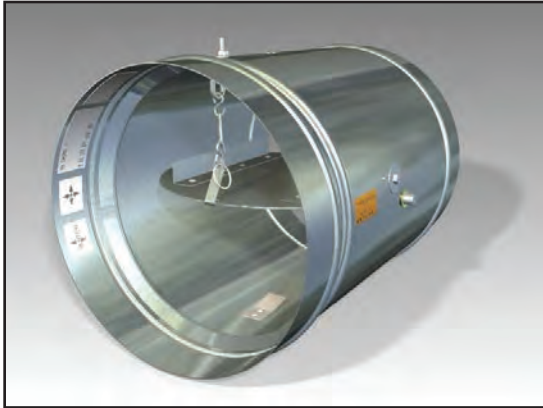
FIRE DAMPER MODELS

MODEL	HOURLY RATING	BLADE TYPE/DESCRIPTION	MAXIMUM VELOCITY** (FPM)	MAXIMUM PRESSURE* (IN. W.G.)
Dynamic 1-1/2 Hour Fire Dampers				
Standard				
DFD60	1-1/2	Airfoil Multi-blade	4000	8
DIBD2	1-1/2	Curtain type	4000	4
DIBD20	1-1/2	Curtain type, Factory Integral sleeve	4000	4
DIBD40	1-1/2	Curtain type, Factory Integral sleeve	4000	4
DIBD60	1-1/2	Curtain type, Factory Integral sleeve	4000	4
DFD35	1-1/2	Triple V-Groove Multi-blade	2000	4
Integral Access Door				
DIBD2-D	1-1/2	Curtain type, Factory Sleeve	3000	4
Grille & Grille Access				
DIBD2GA	1-1/2	Curtain type, Factory Integral sleeve	3000	4
DFD60GA	1-1/2	Airfoil Multi-blade	2000	4
DFD60OW	1-1/2	Airfoil Multi-blade	2000	4
DIBD20G	1-1/2	Curtain type, Factory Integral sleeve	2000	4
DIBD2G	1-1/2	Curtain type, Factory Integral sleeve	2000	4
DFD35GA	1-1/2	Triple V-Groove Multi-blade	2000	4
Out of Wall/Floor				
DIBD2OW	1-1/2	Curtain type, Factory Sleeve	3000	4
DFD35OW	1-1/2	Triple V-Groove Multi-blade, Factory Sleeve	3000	4
True Round				
FDR25(SS)	1-1/2	True Round	2000	4
Stainless Steel				
DIBD2SS	1-1/2	Curtain type	3000	4
DIBD2SSG	1-1/2	Curtain type, Grille mount, Factory Sleeve	3000	4
DFD35SS	1-1/2	Triple V-Groove Multi-blade	2000	4
DFD35SSOW	1-1/2	Triple V-Groove Multi-blade, Out of wall/floor, Factory Sleeve	2000	4
DFD35SSGA	1-1/2	Triple V-Groove Multi-blade, Out of wall/floor, Factory Sleeve	2000	4
Dynamic 3 Hour Fire Dampers				
Standard				
DFD60-3	3	Airfoil Multi-blade	4000	8
DIBD23	3	Curtain type	4000	4
DIBD230	3	Curtain type, Factory Integral sleeve	4000	4
DIBD430	3	Curtain type, Factory Integral sleeve	4000	4
DIBD630	3	Curtain type, Factory Integral sleeve	4000	4



FDR25 and FDR25SS DYNAMIC FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



APPLICATION

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. w.g. (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.
- **Factory Sleeves** of various lengths and gauges to ensure field compliance with UL installation requirements
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) or 285°F (141°C) are optional

Model FDR25 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3225-0245:0115)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Bearings	Hourly Rating
FDR25	20 gauge (.9) galvanized steel. Standard 17" (432) long	Two-piece 14 gauge (1.9) equivalent thickness galvanized steel.	Stainless steel sleeve type, pressed into frame	1 ½
FDR25SS	20 gauge (.9) 304 stainless steel. Standard 17" (432) long	Two-piece 14 gauge (1.9) equivalent thickness 304 stainless steel.	Stainless steel sleeve type, pressed into frame	

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
FDR25, FDR25SS	6" Dia. (152)	24" Dia. (609)

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INSTALLATION INSTRUCTIONS

FDR25 AND FDR25SS ROUND FIRE DAMPER

1½ HOUR UL555 CLASSIFIED

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.

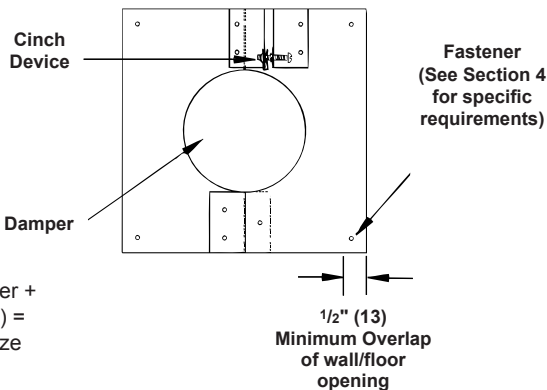
MAXIMUM UL CLASSIFIED SIZE

24" (610) diameter.

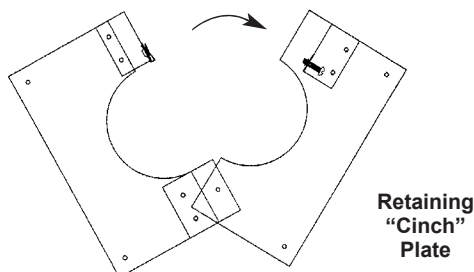
Dimensions shown in parenthesis () indicate millimeters.

RETAINING "CINCH" PLATES (see section 4)

RETAINING "CINCH" PLATE



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



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 2½" (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 2½" (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 gauge 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 air-flow 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 ¼" (6) #10 masonry screw.
- Masonry Floor – "Cinch" plate required on both sides of the floor fastened to the floor with a minimum of 1 ¼" (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 ½" (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 1½" (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.



SEE COMPLETE MARKING
ON PRODUCT

GENERAL INSTALLATION

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

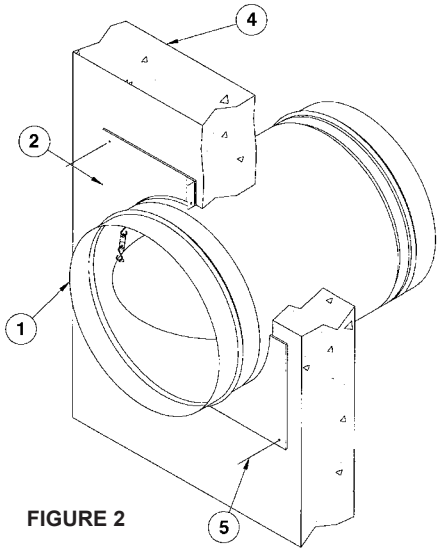


FIGURE 2

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.

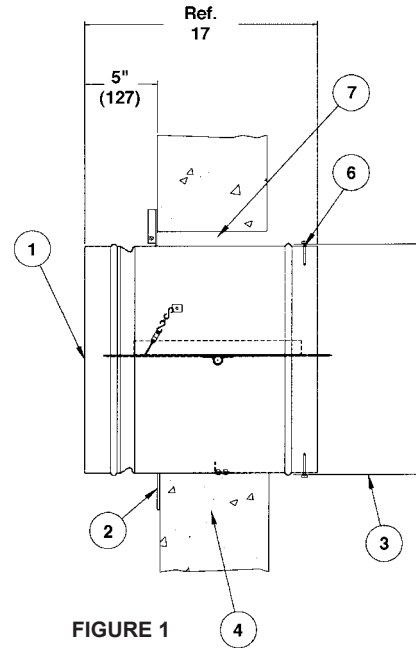
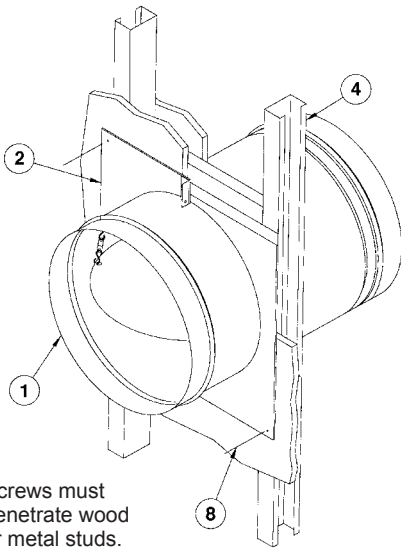


FIGURE 1

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



Screws must penetrate wood or metal studs.

FIGURE 4

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.

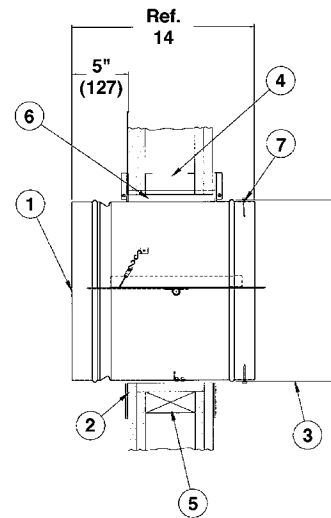
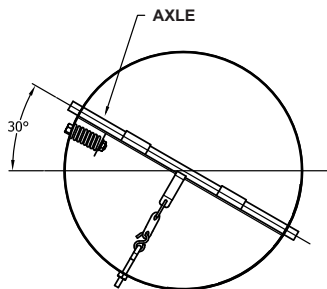
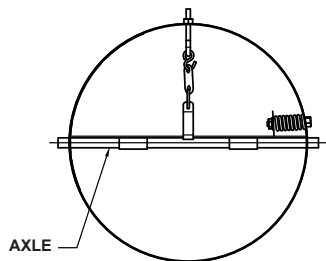


FIGURE 3

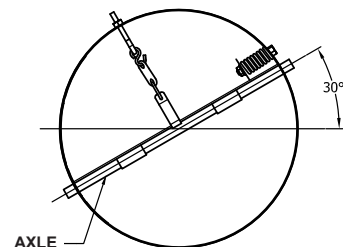
BLADE ORIENTATION



30 Deg. Off Horizontal
Maximum Axle Position



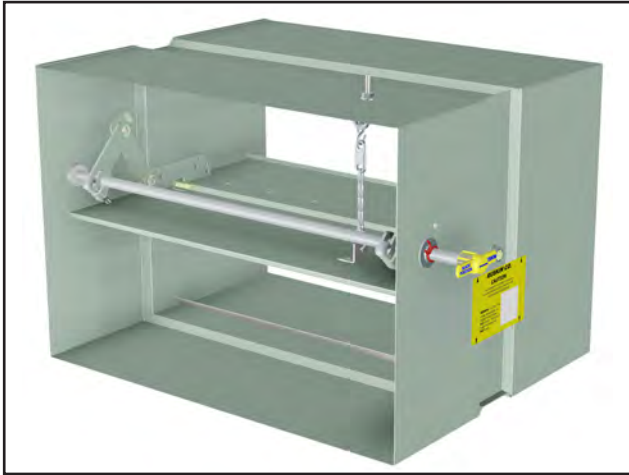
NORMAL
Axle In Horizontal Position



30 Deg. Off Horizontal
Maximum Axle Position

DFD-LP DYNAMIC FIRE DAMPERS

**LOW PRESSURE DROP
UL555 1½ HR. CLASSIFIED**



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 in. 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.

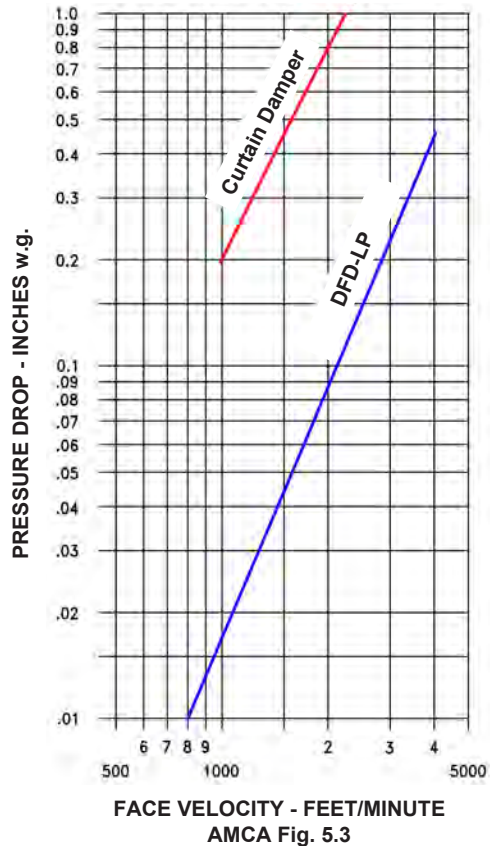
Model DFD-LP meets the requirements for fire dampers established by:

- **National Fire Protection Association NFPA Standards 80, 90A, 92A, 92B, and 101.**
- **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**



SPECIFICATIONS

Damper	Frame	Blades	Bearings	Hourly Rating
DFD-LP	14½" long intertal sleeve/frame 20 (1.0) gauge galvanized steel	Low profile aerodynamic shaped, double skin galvanized steel	Stainless steel sleeve type, pressed into frame	1½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
DFD-LP	6" x 6" (152 x 152)	24" x 14" (609 x 356)

RUSKIN®



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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

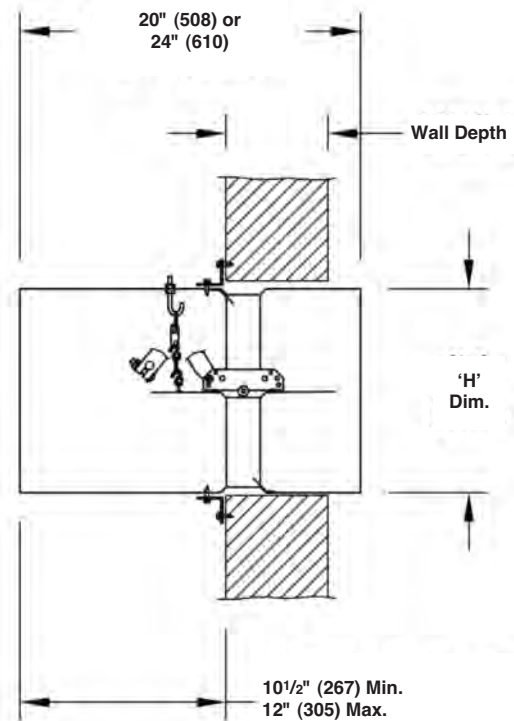
Single section vertical and horizontal installation
24"w x 14"h (610 x 356)

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

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 1/8" 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.

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 gauge 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 by 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

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 gauge 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.

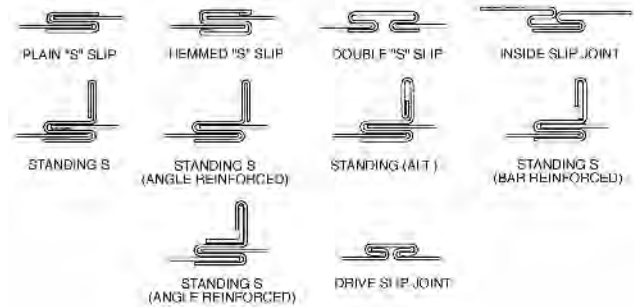
b. Mounting Angle Fastener Spacing

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:



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

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 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.

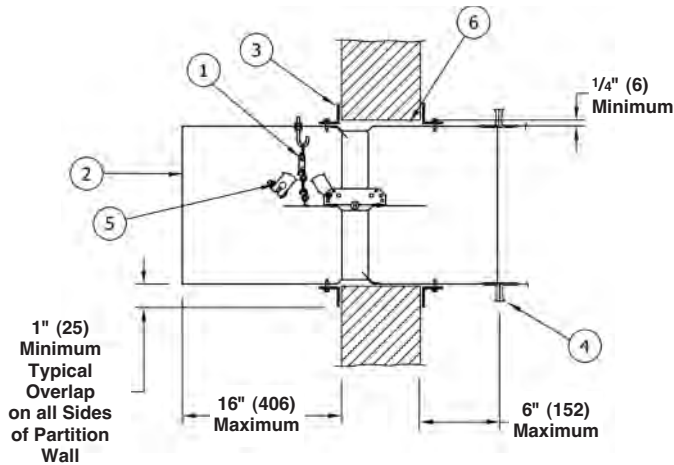
d. Non-Break-Away Duct/Sleeve Connections

If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers 36" (914) wide x 24" (610) high.

7. Installation and Maintenance

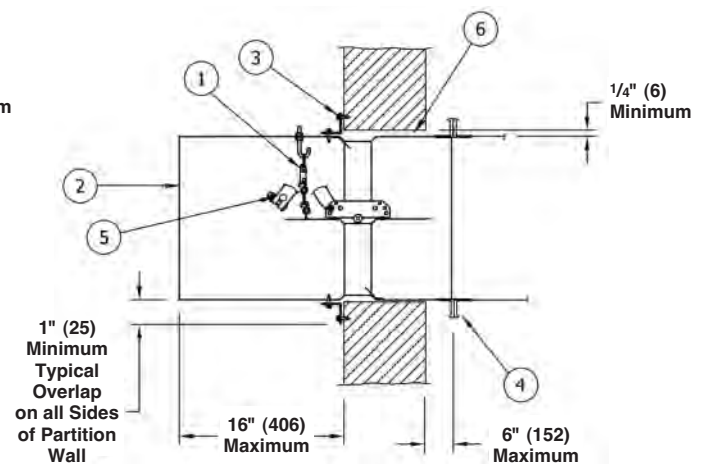
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Do not compress or stretch the damper frame into the duct or opening. Lift or handle the damper using sleeve or frame. Do not lift damper using blades or jackshaft. Dampers must be maintained, cycled and tested in accordance with the latest editions of NFPA 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.



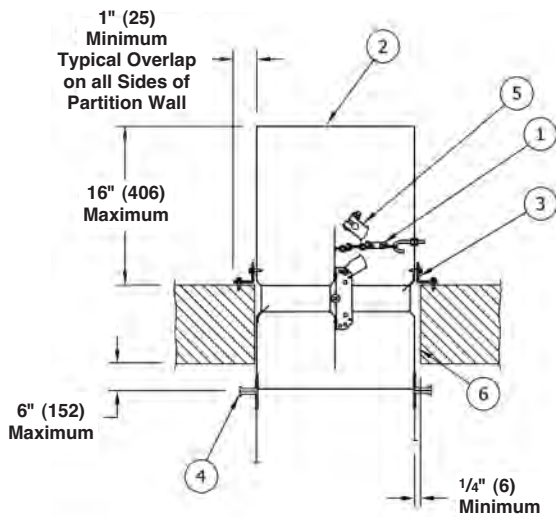
FAST ANGLE (ONE ANGLE) INSTALLATION

Angle may be installed on either side of the partition.

ITEM	DESCRIPTION
1.	Fusible Link Assembly
2.	Damper Frame/Sleeve
3.	Mounting Angles

ITEM	DESCRIPTION
4.	Breakaway Connection
5.	Over-center Link
6.	Opening Clearance

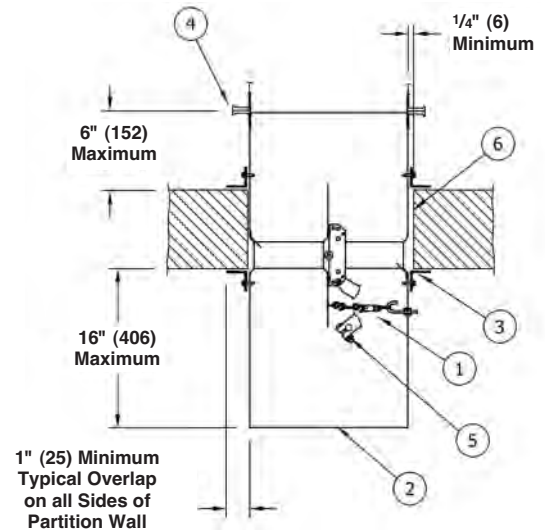
HORIZONTAL INSTALLATION



UNITS WITH ONE ANGLE TOP SIDE OF MASONRY FLOOR

Angles may be installed on top of the floor.

ITEM	DESCRIPTION
1.	Fusible Link Assembly
2.	Damper Frame/Sleeve
3.	Mounting Angles



UNITS WITH ANGLE BOTH SIDES MASONRY FLOOR

Angles are required on both sides of the floor.

ITEM	DESCRIPTION
4.	Breakaway Connection
5.	Over-center Link
6.	Opening Clearance

DIBD2 and DIBD2SS DYNAMIC CURTAIN DAMPERS

1½ HOUR UL555 CLASSIFIED



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 operation during a fire. The DIBD series has a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3225-0245:0005) 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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD2	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type	1 ½
DIBD2SS	304 Stainless Steel (in gauges required by UL listing R5531)	304 Stainless Steel (in gauges required by UL listing R5531)		

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

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal**
DIBD2	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24"w x 24"h (610 x 610)	72"w x 48"h (1829 x 1219)	36"w x 48"h (914 x 1219)
DIBD2SS	6"w x 6"h (152 x 152)		24"w x 24"h (610 x 610)		99"w x 24"h (2515 x 610)	48"w x 36"h (1219 x 914)
						N/A

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

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IBD2 and IBD2SS STATIC CURTAIN FIRE DAMPERS

1½ HOUR UL CLASSIFIED



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 has the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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
 - 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 air stream
 - 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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD2	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless steel constant force or spring clip type	1 ½
IBD2SS	304/316 Stainless Steel (in gauges required by UL listing R5531)	304/316 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD2	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 72"h (838 x 1829)	33"w x 38"h (838 x 965)	120"w x 72"h (3048 x 1829)	114"w x 38"h (2896 x 965)
IBD2SS			48"w x 30"h (1219 x 762)	30"w x 45"h (762 x 1143)		99"w x 72"h (2514 x 1829)

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

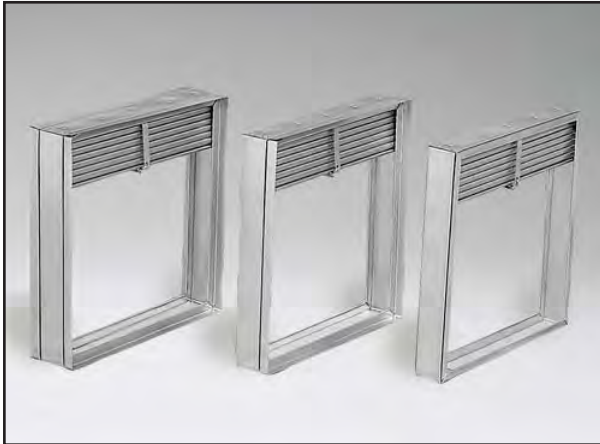
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IBDT, T1 AND T2 THIN LINE FRAME STATIC CURTAIN FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



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. IBT series dampers are classified as a static damper for use in an HVAC system that has the fans turn off during a fire. The narrow depth of the damper assembly makes the IBDT series dampers perfect for transfer openings.

Model IBDT series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (3225-0245:0005)
- **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
- **G Style** - Frame and blades in the airstream
 - o For grille applications
 - o Sleeve Required

OPTIONS

- **FM Approvals** as Specification Tested Product.
- **Factory Sleeves** of various lengths and gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBDT IBDT1 IBDT2	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless steel constant force or spring clip type	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBDT IBDT1 IBDT2	4w" x 4h" (102 x 102)	4w" x 4h" (102 x 102)	40w" x 48h" (1016 x 1219)	60"w x 12"h (1524 x 305)	N/A	N/A

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

RUSKIN®

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INSTALLATION INSTRUCTIONS 1 1/2 HOUR UL CLASSIFIED CURTAIN TYPE (D)IBD2, (D)IBD2SS AND IBDT 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 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, IBDT1 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 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 1/8" 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, 3/16" (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
Stainless steel dampers	6" (152) spacing
Horizontal Mount (In floor)	
All dampers	6" (152) spacing

Multiple section horizontal mount dampers require a 14 gauge 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 gauge 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 by 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 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 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 gauge 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 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

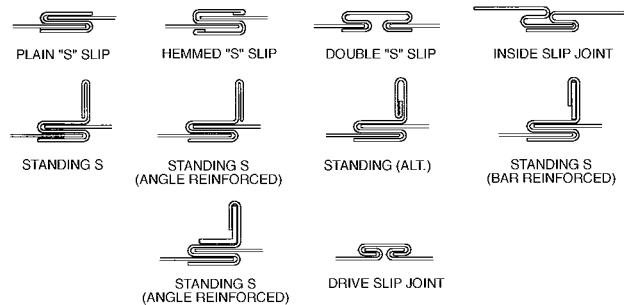
For one angle installations the sleeve fasteners shall be

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:



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

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.

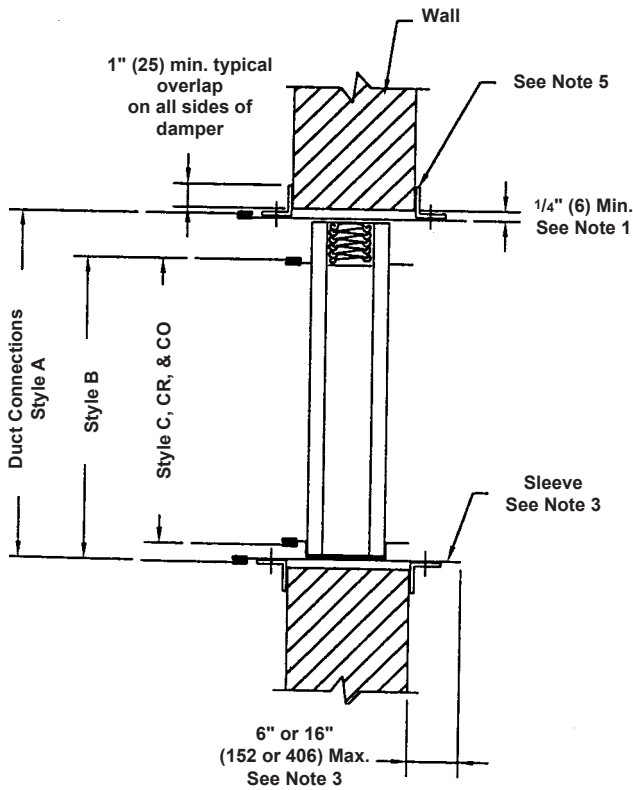
d. Non-Break-Away Duct/Sleeve Connections

If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

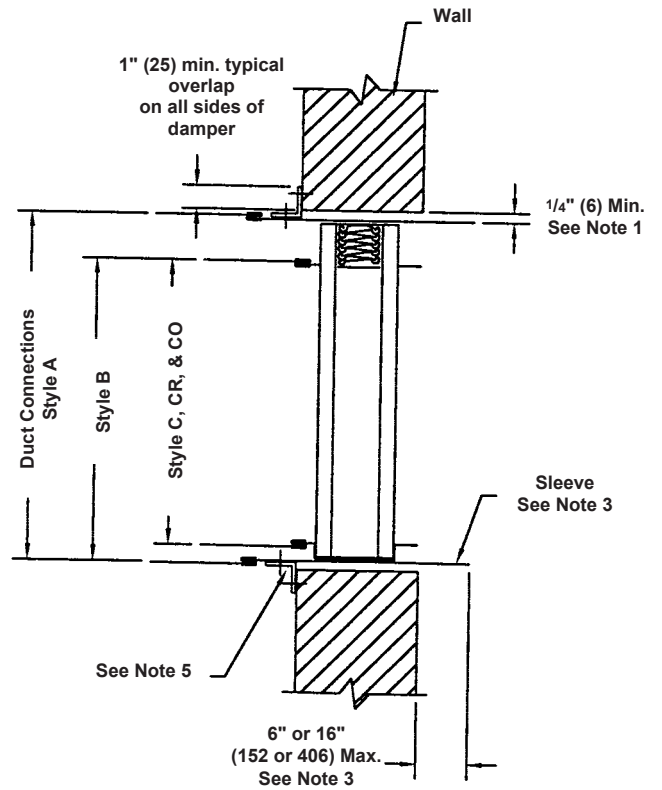
7. Installation and Maintenance

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



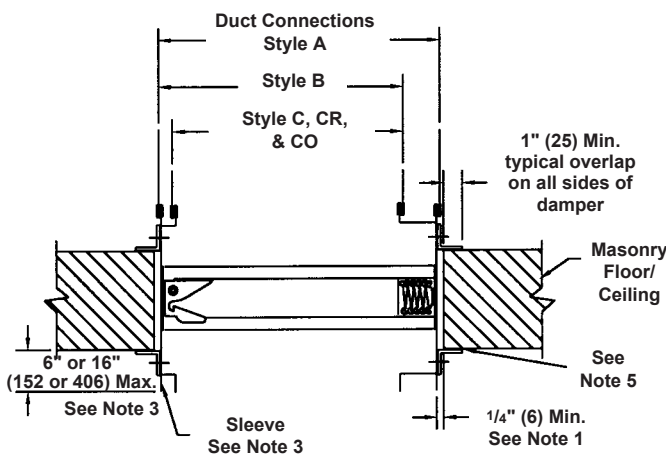
TWO ANGLE INSTALLATION



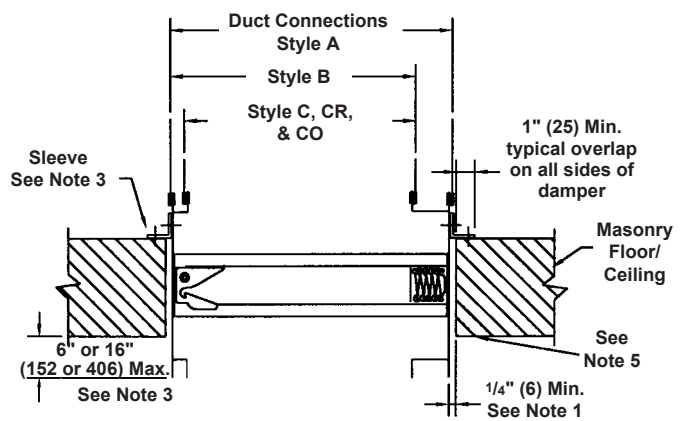
ONE ANGLE INSTALLATION

FIGURE 1

HORIZONTAL INSTALLATION



TWO ANGLE INSTALLATION



ONE ANGLE INSTALLATION

FIGURE 2

FASTENER SPACING

HORIZONTAL INSTALLATION

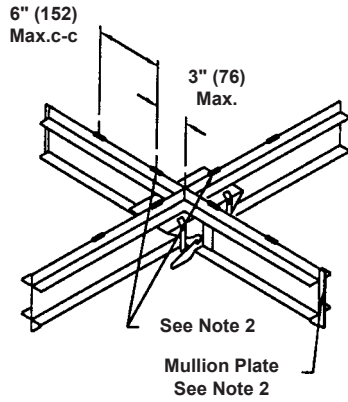


FIGURE 3

VERTICAL INSTALLATION

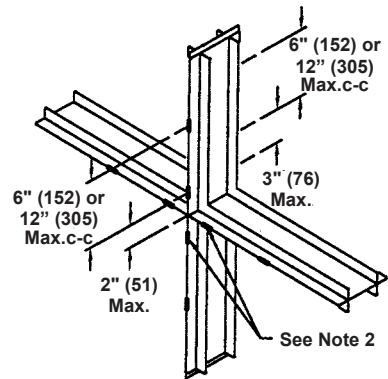


FIGURE 4

REINFORCING PLATE

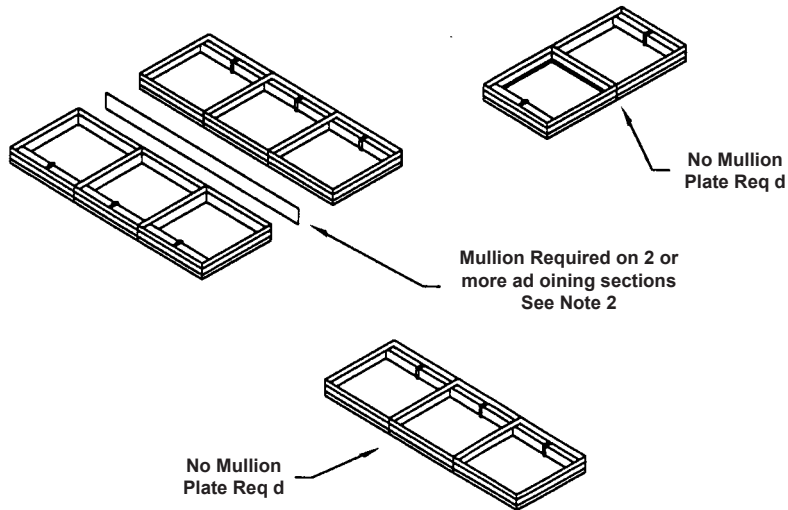


FIGURE 5

DIBD20, DIBD40 and DIBD60 DYNAMIC CURTAIN FIRE DAMPER

1½ HOUR UL555 CLASSIFIED



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 operation during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (3225-0245:0005) DIBD20, 40, and 60
- **New York City** (MEA 252-05-E)

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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD20 DIBD40 DIBD60	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless steel constant force or spring clip type	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
DIBD20 DIBD40 DIBD60	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24"w x 24"h (610 x 610)	54"w x 48"h (1372 x 1219) 48"w x 54"h (1219 x 1372)	36"w x 48"h (914 x 1219) 48"w x 36"h (1219 x 914)

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

RUSKIN®



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IBD20, IBD40 and IBD60 STATIC CURTAIN FIRE DAMPER

1½ HOUR UL555 CLASSIFIED



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 less than 3 hours. IBD series dampers are classified as a static damper for use in an HVAC system that has the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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

- Dynamic 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
 - 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 gauges also for one-side or two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) optional

SPECIFICATIONS

Damper	Frame	Blades		Hourly Rating
IBD20 IBD40 IBD60	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD20 IBD40 IBD60	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 54"h (838 x 1372) 48"w x 30"h (1219 x 762) 36"w x 36"h (914 x 914)	33"w x 38"h (838 x 965) 30"w x 45"h (762 x 1143)	54"w x 54"h (1372 x 1372)	54"w x 54"h (1372 x 1372)

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

RUSKIN®



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INSTALLATION INSTRUCTIONS 1½ 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 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, 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 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, 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.

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
- Mullions for Dampers in Oversized Wall Openings



SEE COMPLETE MARKING
ON PRODUCT

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 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 1/8" 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 16 ga (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 gauge 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 gauge 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 by 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 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 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 gauge 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 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 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

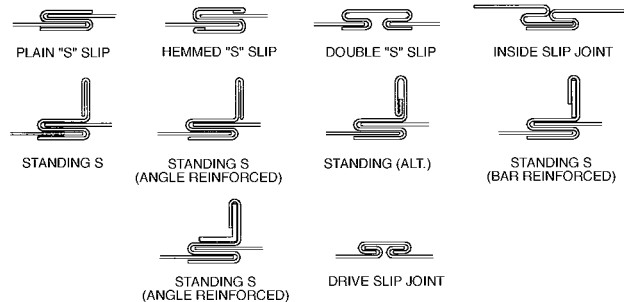
b. Mounting Angle Fastener Spacing

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:



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 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 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

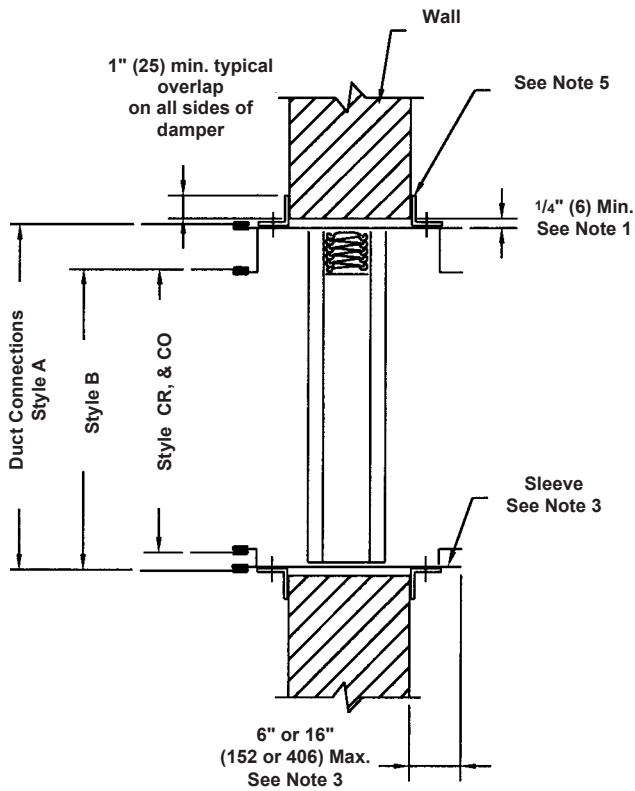
If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance

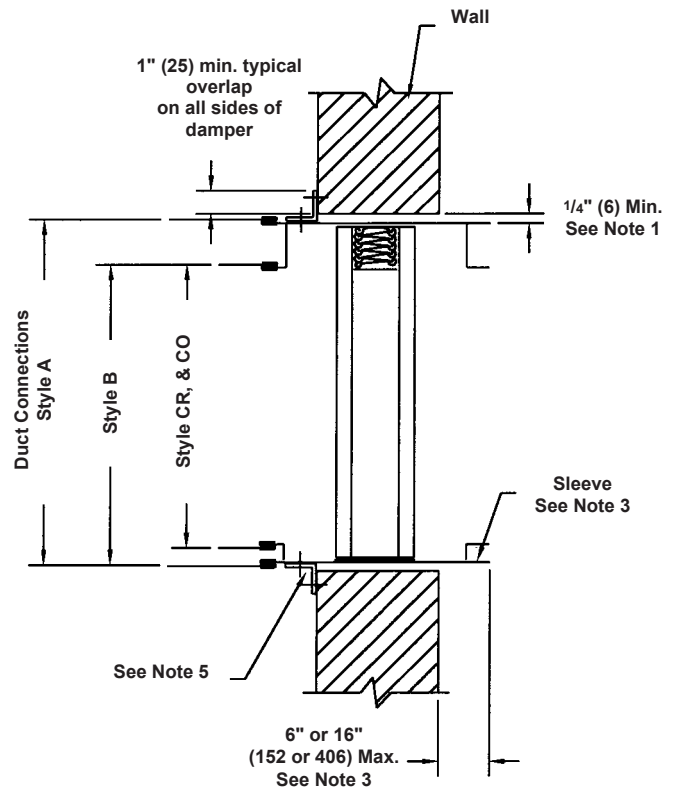
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests 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

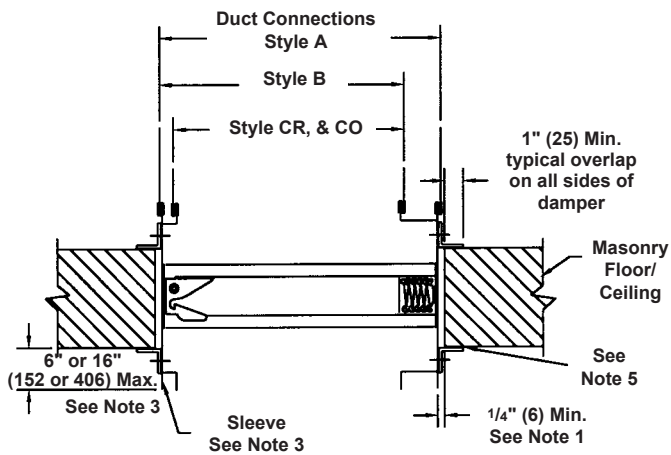


ONE ANGLE INSTALLATION

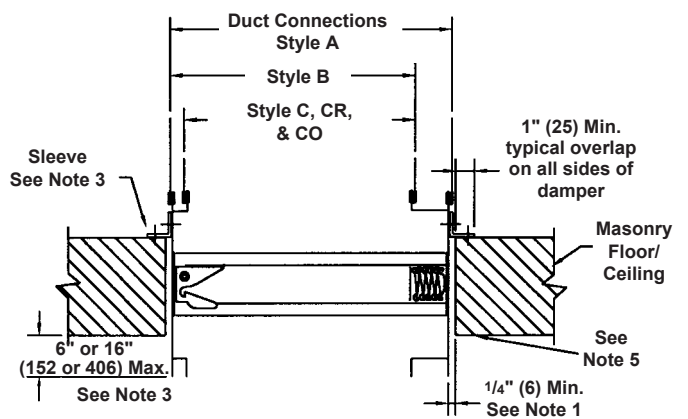
FIGURE 1

HORIZONTAL INSTALLATION

Damper is properly installed when leading edge of closed blades is within the wall.



TWO ANGLE INSTALLATION



ONE ANGLE INSTALLATION

FIGURE 2

FASTENER SPACING

VERTICAL INSTALLATION

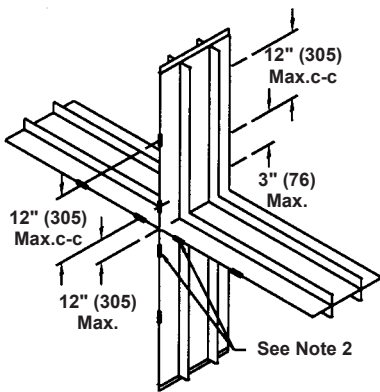


FIGURE 3

HORIZONTAL INSTALLATION

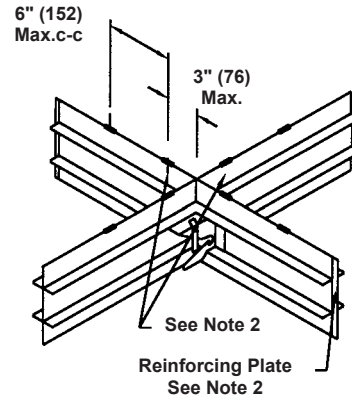


FIGURE 4

REINFORCING PLATE

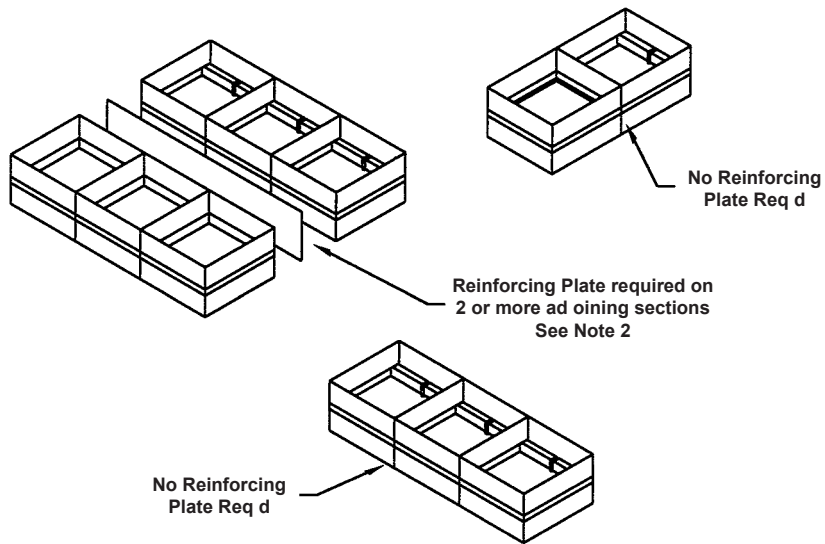
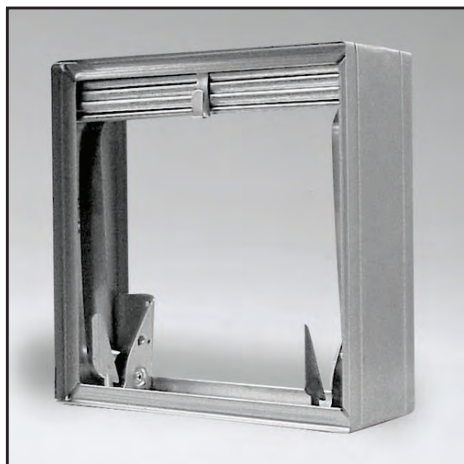


FIGURE 5

DIBD23 and DIBD23SS DYNAMIC CURTAIN FIRE DAMPERS

3 HOUR UL555 CLASSIFIED



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 operation during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association NFPA Standards 80, 90A, 92A, 92B, and 101.**
- **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
 - 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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD23	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type	3
DIBD23SS	304/316 Stainless Steel (in gauges required by UL listing R5531)	304/316 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal**
DIBD23	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24"w x 24"h (610 x 610)	72"w x 48"h (1829 x 1219)	36"w x 48"h (914 x 1219)
DIBD23SS			24"w x 24"h (610 x 610)		48"w x 72"h (1219 x 1829)	N/A

*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.

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IBD23(SS) STATIC CURTAIN FIRE DAMPERS

3 HOUR UL555 CLASSIFIED



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 has the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3225-0245:0004) IBD23 and IBD23SS
- **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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD23	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type	3
IBD23SS	304/316 Stainless Steel (in gauges required by UL listing R5531)	304/316 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD23 IBD23SS	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	36"w x 36"h (914 x 914)	30"w x 45"h (762 x 1143)	90"w x 72"w (2286 x 1829)	90"w x 91"h (2286 x 2311)

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

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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 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 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 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.

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



SEE COMPLETE MARKING
ON PRODUCT

California State Fire Marshal Listing No. 3225-245:004

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 1/8" 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

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 gauge 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 gauge 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 by 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 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 gauge 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

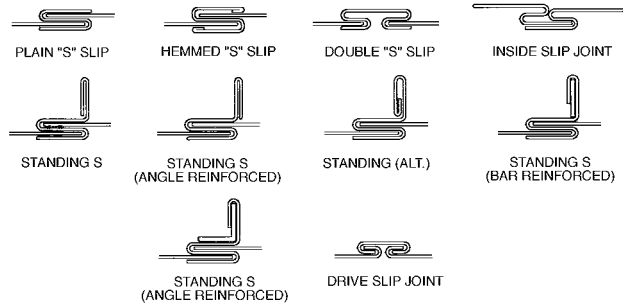
b. Mounting Angle Fastener Spacing

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:

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 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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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.

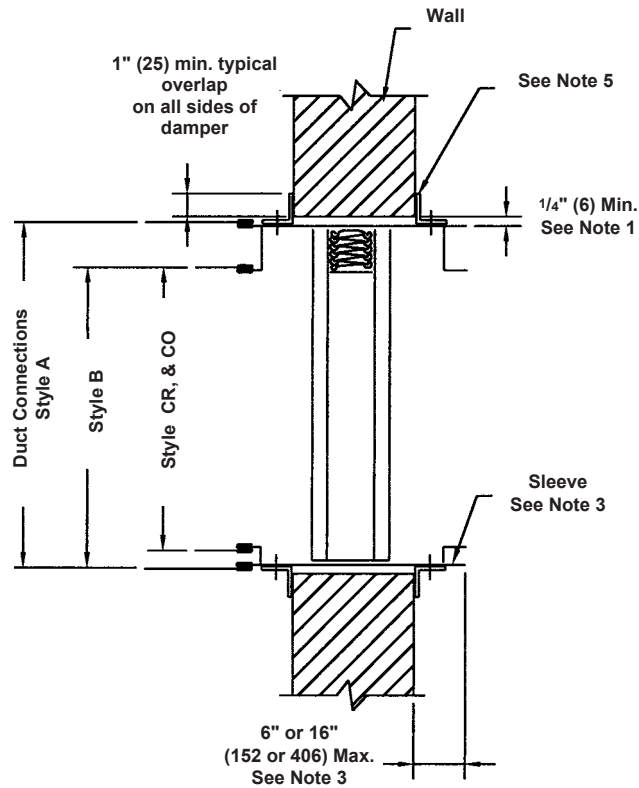


FIGURE 1

HORIZONTAL INSTALLATION

Damper is properly installed when leading edge of closed blades is within the floor.

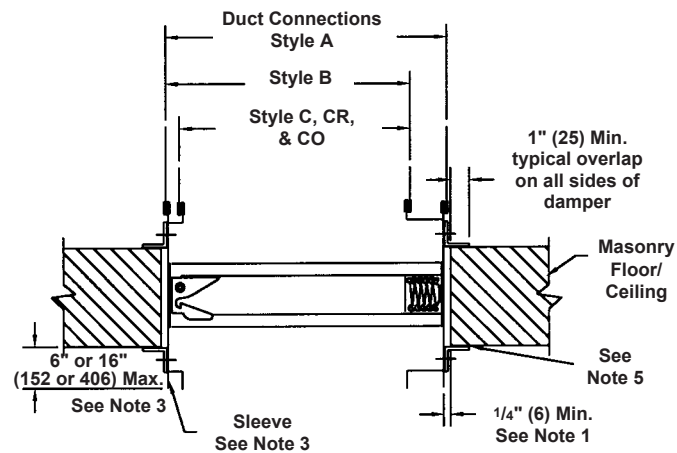


FIGURE 2

FASTENER SPACING

HORIZONTAL INSTALLATION

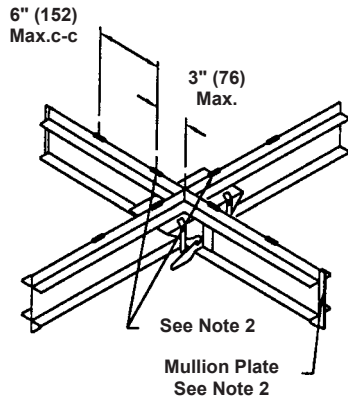


FIGURE 3

VERTICAL INSTALLATION

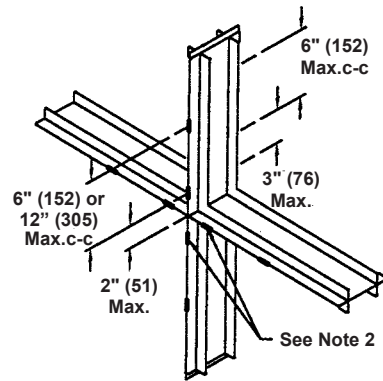


FIGURE 4

REINFORCING PLATE

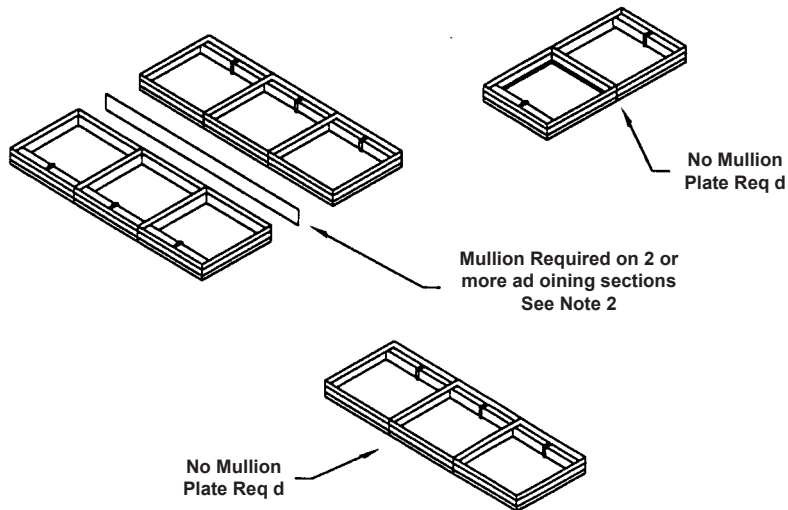


FIGURE 5

DIBD230, DIBD430 and DIBD630 DYNAMIC CURTAIN FIRE DAMPER

1½ HOUR UL555 CLASSIFIED



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 operational during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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.
- **FAST Angle** factory supplied for labor saving angle one-side installation. Other angles of various sizes and gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD230 DIBD430 DIBD630	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type	3

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
DIBD230 DIBD430 DIBD630	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24"w x 24"h (610 x 610)	54"w x 48"h (1372 x 1219) 48"w x 54"h (1219 x 1372)	36"w x 48"h (914 x 1219) 48"w x 36"h (1219 x 914)

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

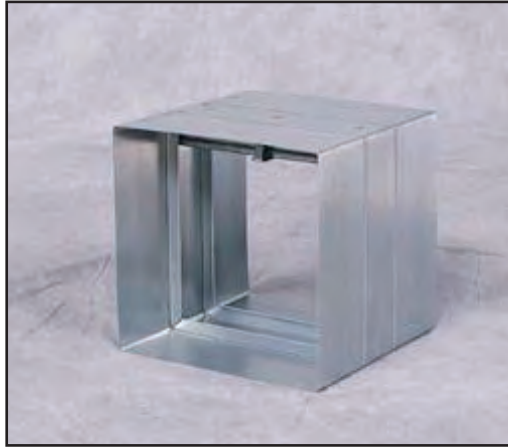
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IBD230 IBD430 and IBD630 STATIC CURTAIN FIRE DAMPER

3 HOUR UL555 CLASSIFIED



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:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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

- Dynamic 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
 - 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 gauges also for two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) optional.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD230 IBD430 IBD630	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type	3

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD230 IBD430 IBD630	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	36"w x 36"h (914 x 914)	30"w x 45"h (762 x 1156)	54"w x 54"h (1372 x 1372)	54"w x 54"h (1372 x 1372)

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

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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 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, 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

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 1/8" 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

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 gauge 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 gauge 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 by 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 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 gauge 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

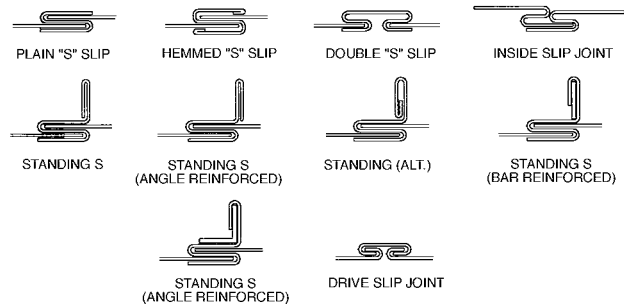
b. Mounting Angle Fastener Spacing

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:

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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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.

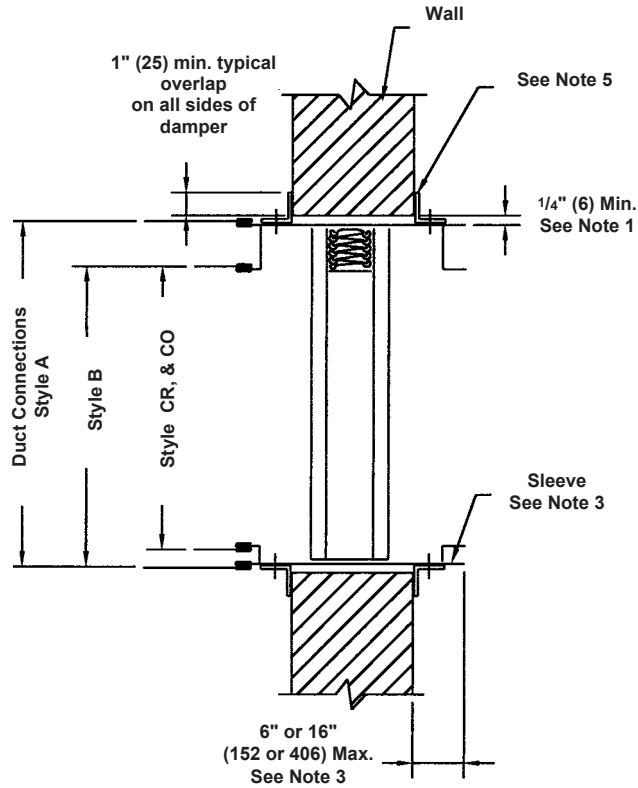


FIGURE 1

HORIZONTAL INSTALLATION

Damper is properly installed when leading edge of closed blade is within the wall.

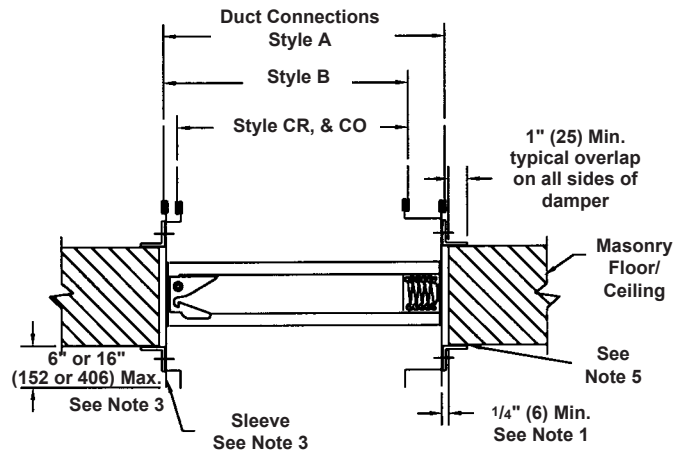


FIGURE 2

FASTENER SPACING

VERTICAL INSTALLATION

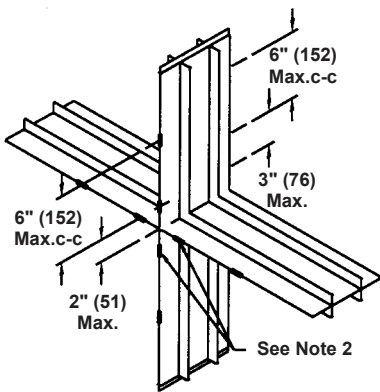


FIGURE 3

HORIZONTAL INSTALLATION

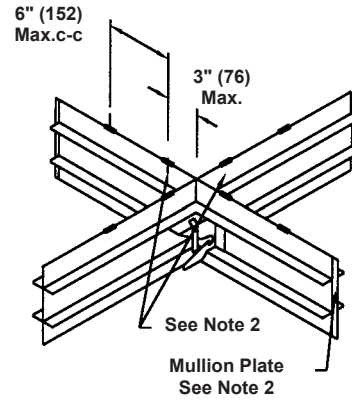


FIGURE 4

REINFORCING PLATE

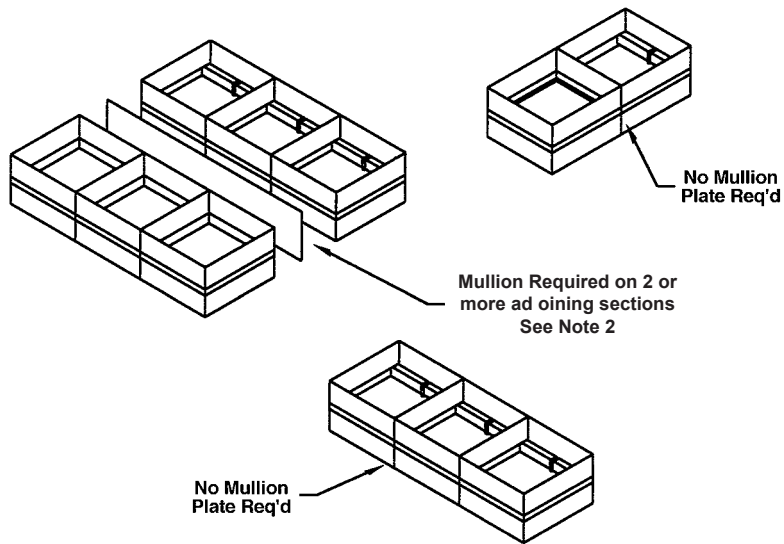


FIGURE 5

DFD60 HIGH PERFORMANCE DYNAMIC FIRED DAMPER

1½ HOUR UL555 CLASSIFIED



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 gauges 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 gauges 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 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 operation during a fire. DFD60 series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 8 in. w.g. (2 kPa).

Model DFD60 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3225-0245:0004)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
DFD60	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge galvanized steel equivalent thickness.	301 stainless steel	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal**
DFD60	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	32"w x 48"h (813 x 1219)	30"w x 48"h (762 x 1219)	64"w x 96"h (1626 x 2438) 120"w x 48"h (3048 x 1219)	60"w x 96"h (1524 x 2438) 120"w x 48"h (3048 x 1219)

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

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DFD35 DYNAMIC FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



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 gauges 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 gauges 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. w.g. (1 kPa).

Model DFD35 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3225-0245:0005)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
DFD35	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	6" (152) wide and 16 (1.6) gauge galvanized steel.	301 stainless steel	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section	Maximum Multiple Section
	Vertical	Horizontal	Vertical or Horizontal	Vertical or Horizontal
DFD35	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	36"w x 48"h (914 x 1219)	72"w x 96"h (1829 x 2438) 120"w x 48"h (3048 x 1219)

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

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FD60 STATIC FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



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 has the fans turn off during a fire.

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 gauges 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 gauges 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 FD60 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3225-0245:0004)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
FD60	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge galvanized steel equivalent thickness.	301 stainless steel	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
FD60	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	32"w x 48"h (813 x 1219)	30"w x 48"h (762 x 1219)	120"w x 96"h (3048 x 2438)	120"w x 96"h (3048 x 2438)

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FD35 STATIC FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



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 has the fans turn off during a fire.

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 gauges 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 gauges 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 FD35 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (#3225-0245:0005)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
FD35	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	6" (152) wide and 16 (1.6) gauge galvanized steel.	301 stainless steel	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section	Maximum Multiple Section
	Vertical	Horizontal	Vertical or Horizontal	Vertical or Horizontal
FD35	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	32"w x 48"h (914 x 1219)	120"w x 96"h (3048 x 2438)

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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

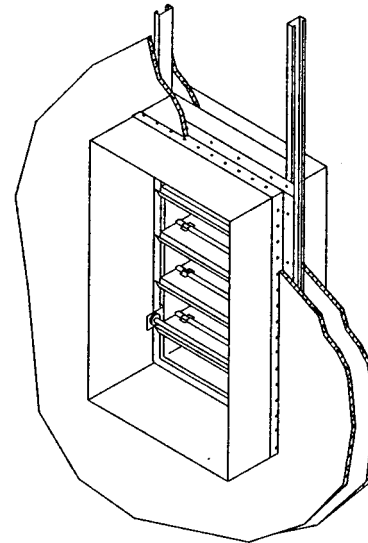
120" w x 96" h (3048 x 2438)

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
- FD35OW and FD60OW 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 $1/8$ " 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.

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 gauge 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 by 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

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 gauge 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

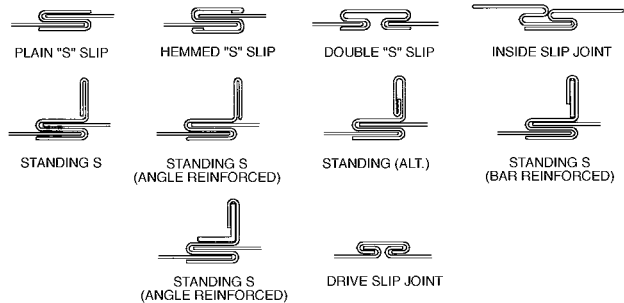
For one angle installations the sleeve fasteners shall be spaced at 6" (152) o.c. and the wall or floor fasteners shall be spaced at 12" (305) o.c. with a minimum of 2 fasteners on each side, top and bottom. Screw fasteners used in metal stud must engage the metal stud a minimum of $1/2$ " (13). Screw 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:



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

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.

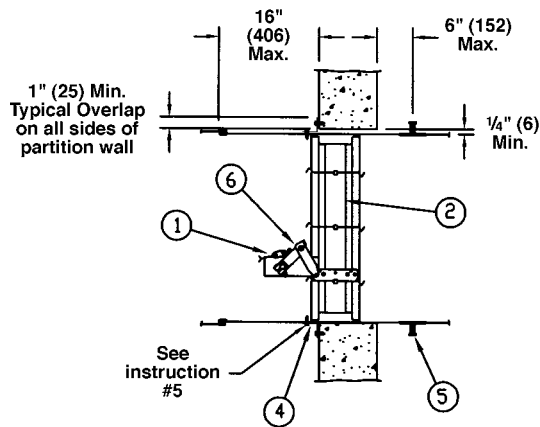
d. Non-Break-Away Duct/Sleeve Connections

If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers 36" (914) wide x 24" (610) high.

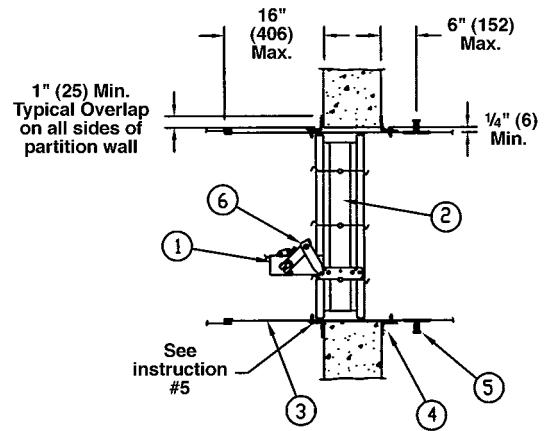
7. Installation and Maintenance

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 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



FAST ANGLE (ONE ANGLE) INSTALLATION
Angle may be installed on either side of the partition.

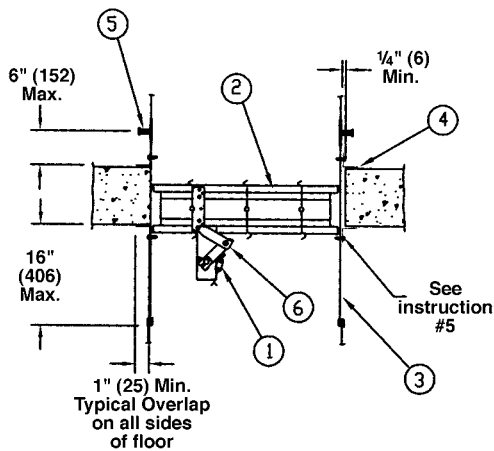


TWO ANGLE INSTALLATION
Angles are required on both sides of the partition.

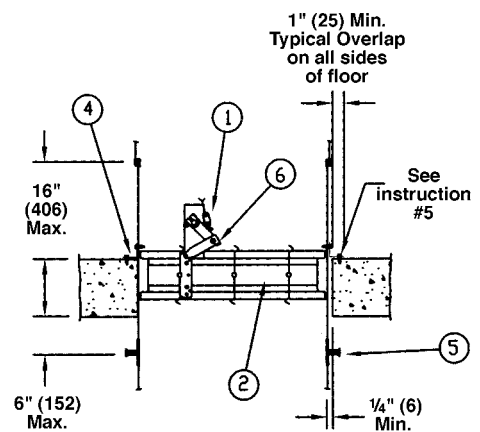
ITEM DESCRIPTION

1. Fusible Link
2. Damper Frame
3. Sleeve
4. Mounting Angles
5. Breakaway Connection
6. Over-center Link

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

DFD35SS AND FD35SS STATIC FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



APPLICATION

Ruskin DFD35SS dynamic or static fire dampers 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. FD35SS series dampers are classified as a static damper for use in an HVAC system that has the fans turn off during a fire.

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 gauges 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 gauges 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:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal** Listing (3225-0245:0005)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
DFD35SS FD35SS	5" x 16 gauge (127 x 1.6) 304/316 Stainless Steel, single piece, hat-shaped channel	6" (152) wide and 16 (1.6) gauge 304/316 Stainless Steel	301 Stainless Steel	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section	Maximum Multiple Section
	Vertical	Horizontal	Vertical or Horizontal	Vertical or Horizontal
DFD35SS	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	30"w x 48"h (762 x 1219)	60"w x 96"h (1524 x 2438)
FD35SS				90"w x 48"h (2286 x 1219)



INSTALLATION INSTRUCTIONS

FD35SS AND DFD35SS FIRE RATED MULTIPLE BLADE DAMPER

1½ HOUR RATING FOR USE IN DYNAMIC AND STATIC SYSTEMS

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)

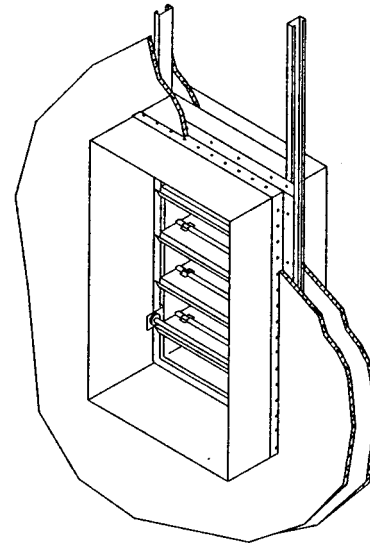
Multiple section assembly vertical and horizontal installation
90"w x 48"h (2286 x 1219)

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
- FD35OW and FD60OW 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)FD35SS 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 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 $\frac{3}{16}$ " 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 gauge 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 (1.5) for dampers up to 36" (914) wide by 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

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 $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x 20 gauge 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, $\frac{3}{16}$ " (3) steel rivets or $\frac{1}{2}$ " (13) long welds.

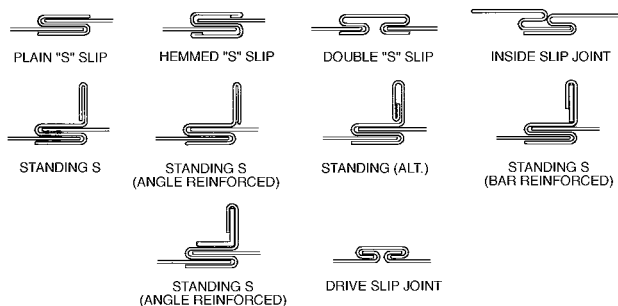
b. Mounting Angle Fastener Spacing

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:



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
- 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 $\frac{3}{8}$ " (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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

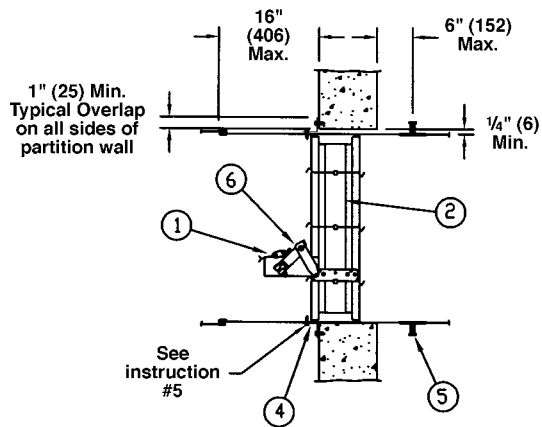
7. Actuator Connections

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.

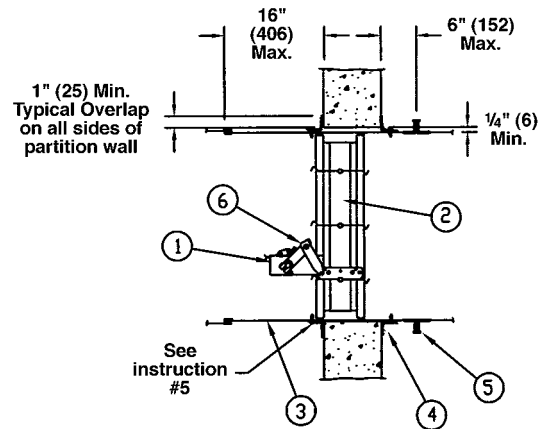
8. Installation and Maintenance

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



FAST ANGLE (ONE ANGLE) INSTALLATION
Angle may be installed on either side of the partition.

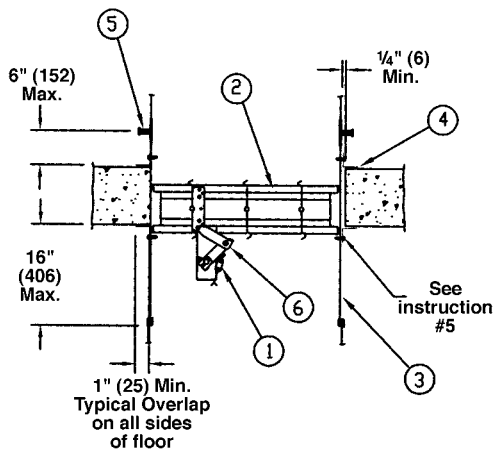


TWO ANGLE INSTALLATION
Angles are required on both sides of the partition.

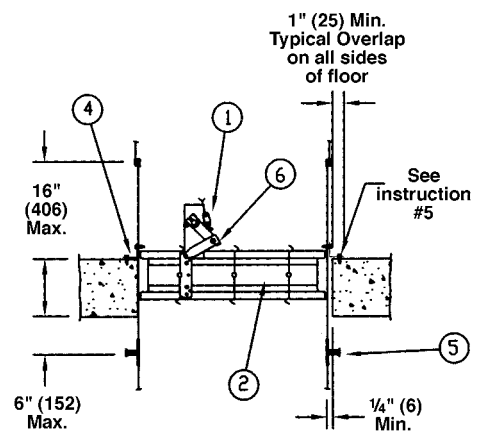
ITEM DESCRIPTION

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

DFD60-3 HIGH PERFORMANCE DYNAMIC FIRE DAMPERS

3 HOUR UL555 CLASSIFIED



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 gauges 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 gauges 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 operation during a fire. DFD60 series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 8 in. wg (2 kPa).

Model DFD60-3 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
DFD60-3	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	One-piece airfoil, nominal 6" (152) wide and 16 (1.6) gauge galvanized steel equivalent thickness.	301 stainless steel	3

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal**
DFD60-3	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	30"w x 48"h (762 x 1219)	30"w x 48"h (762 x 1219)	60"w x 96"h (1524 x 2438) 120"w x 48"h (3048 x 1219)	60"w x 96"h (1524 x 2438) 120"w x 48"h (3048 x 1219)

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

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FD60-3 STATIC FIRE DAMPERS

3 HOUR UL555 CLASSIFIED



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 has the fans turn off during a fire.

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 gauges 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 gauges also for two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional.

Model FD60 series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3225-0245:0004)
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
FD60-3	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge galvanized steel equivalent thickness.	301 stainless steel	3

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
FD60-3	8"w x 6"h (203 x 152)	8"w x 6"h (203 x 152)	30"w x 48"h (762 x 1219)	30"w x 48"h (762 x 1219)	120"w x 96"h (3048 x 2438)	120"w x 96"h (3048 x 2438)

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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)

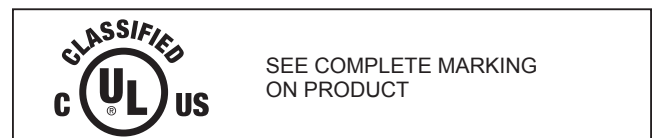
Multiple section assembly vertical and horizontal installation
120"w x 96"h (3048 x 2438)

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 1/8" 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.

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 gauge 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 by 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

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 gauge 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.

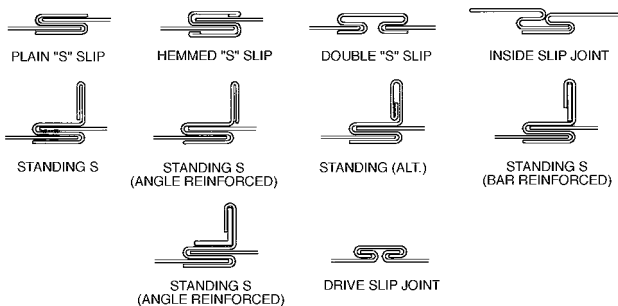
b. Mounting Angle Fastener Spacing

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:



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

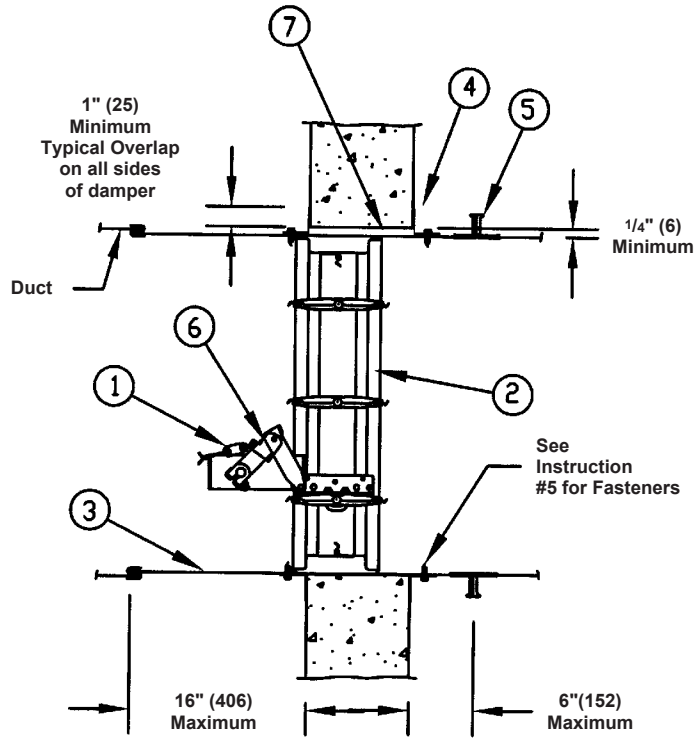
7. Installation and Maintenance

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 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

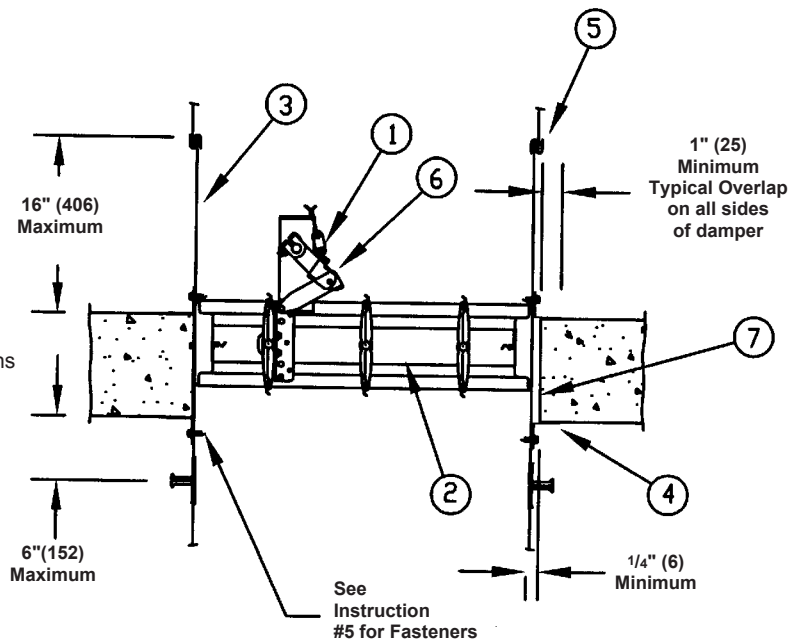
- | ITEM | DESCRIPTION |
|------|-----------------------|
| 1. | Fusible Link |
| 2. | Damper Frame |
| 3. | Sleeve |
| 4. | Mounting Angles |
| 5. | Breakaway Connections |
| 6. | Overcenter Link |
| 7. | Opening Clearance |



**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

1½ HOUR UL555 CLASSIFIED



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. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3225-0245:0005) 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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD2-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	1 ½
DIBD2SS-CUL	304 Stainless Steel (in gauges required by UL listing R5531)	304 Stainless Steel (in gauges required by UL listing R5531)		

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

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal**
DIBD2-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24"w x 24"h (610 x 610)	72"w x 48"h (1829 x 1219)	36"w x 48"h (914 x 1219)
DIBD2SS-CUL			24"w x 24"h (610 x 610)		99"w x 24"h (2515 x 610)	
					48"w x 72"h (1219 x 1829)	

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

RUSKIN®



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IBD2-CUL AND IBD2SS-CUL STATIC CURTAIN FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



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 has the fans turn off during a fire.

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (#3225-0245:0005) IBD2 and IBD2SS
- **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 ar
 - o Sealed assembl
- 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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD2-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	1 ½
IBD2SS-CUL	304/316 Stainless Steel (in gauges required by UL listing R5531)	304/316 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD2-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 72"h (838 x 1829)	33" x 38"h (838 x 965)	120"w x 72"h (3048 x 1829)	114"w x 38"h (2896 x 965)
IBD2SS-CUL			48"w x 30"h (1219 x 762)	30"w x 45"h (762 x 1143)		

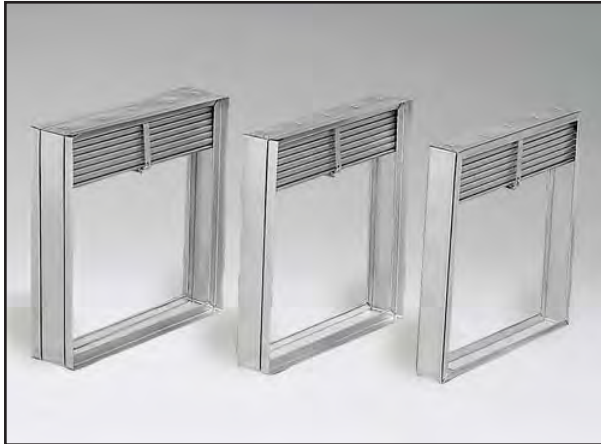
**See product data sheets for more details on single and multiple section sizing.

RUSKIN®



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IBDT-CUL, IBDT1-CUL AND IBDT2-CUL THIN LINE FRAME STATIC CURTAIN FIRE DAMPERS 1½ HOUR UL555 RATED



APPLICATION

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:
- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
 - **ICC International Building Codes**
 - **CSFM California State Fire Marshal**
Listing (3225-0245:0005)
 - **New York City** (MEA 252-05-E)

FEATURES

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

TRANSITIONS AND STYLES

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

OPTIONS

- **FM Approvals** as Specification Tested Product.
- **Factory Sleeves** of various lengths and gauges 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 gauges also for one-side or two-side installation.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBDT-CUL IBDT1-CUL IBDT2-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel spring clip type of horizontal mount only	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBDT-CUL IBDT1-CUL IBDT2-CUL	4"w x 4"h (102 x 102)	4"w x 4"h (102 x 102)	40"w x 48"h (1016 x 1219)	60"w x 12"h (1524 x 305)	N/A	N/A



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 (1219 x 762) or 33"w x 72"h (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.



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 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 1/8" 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 16 ga (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
Stainless steel dampers	6" (152) spacing
Horizontal Mount (In floor)	
All dampers	6" (152) spacing

Multiple section horizontal mount dampers require a 14 gauge 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 gauge 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 by 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 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 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 gauge 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 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

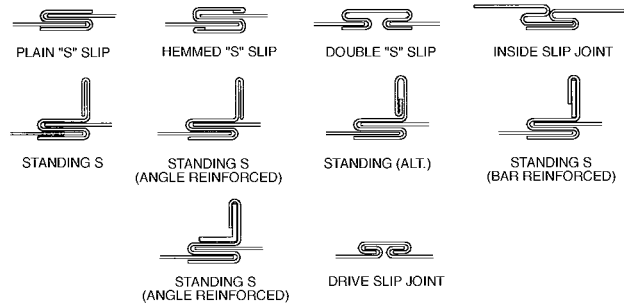
For one angle installations the sleeve fasteners shall be

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:



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 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 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.

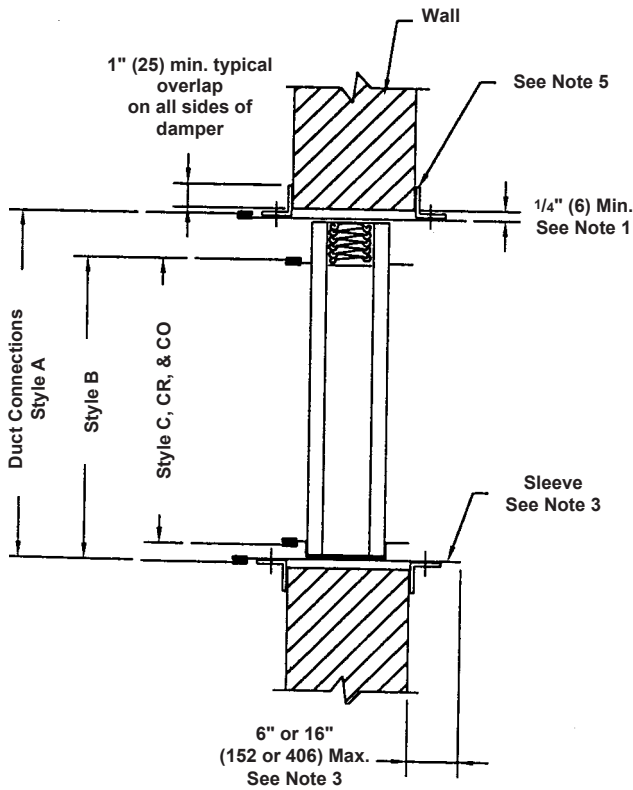
d. Non-Break-Away Duct/Sleeve Connections

If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

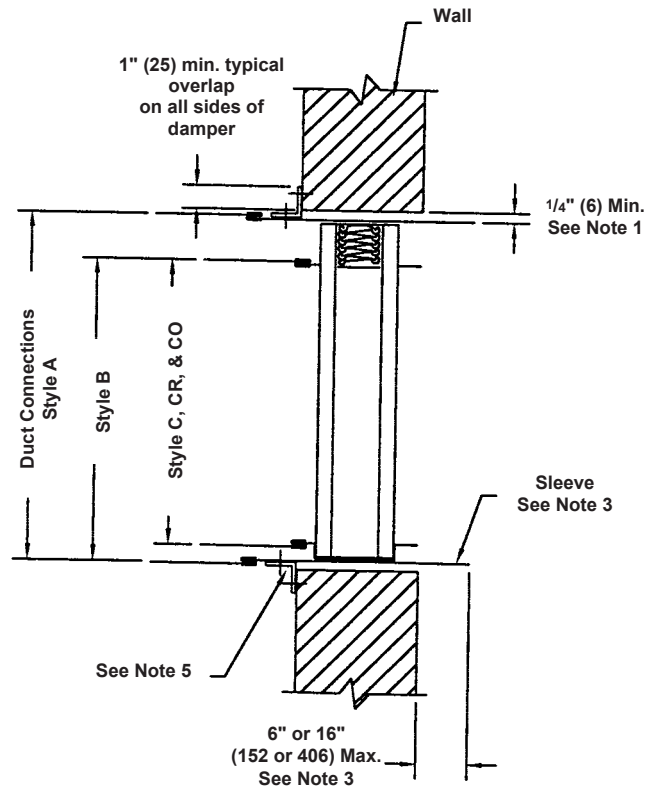
7. Installation and Maintenance

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



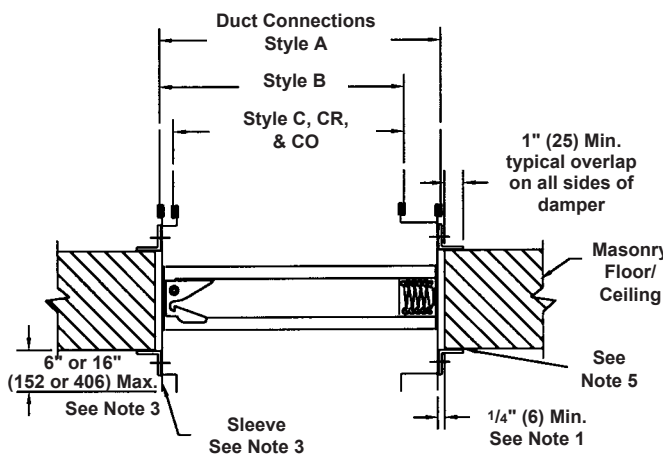
TWO ANGLE INSTALLATION



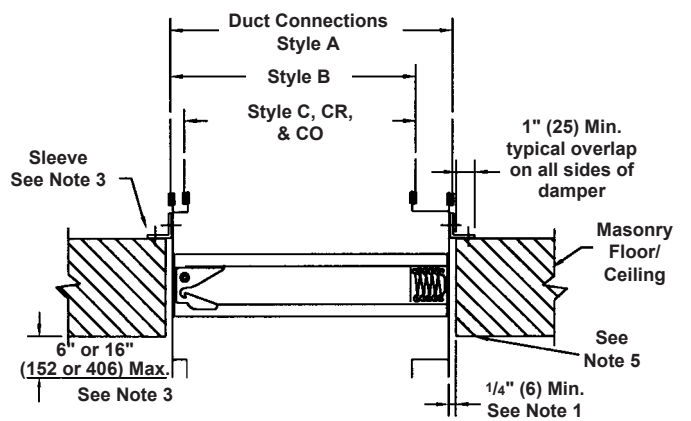
ONE ANGLE INSTALLATION

FIGURE 1

HORIZONTAL INSTALLATION



TWO ANGLE INSTALLATION



ONE ANGLE INSTALLATION

FIGURE 2

FASTENER SPACING

HORIZONTAL INSTALLATION

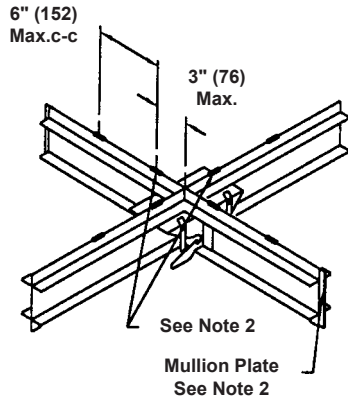


FIGURE 3

VERTICAL INSTALLATION

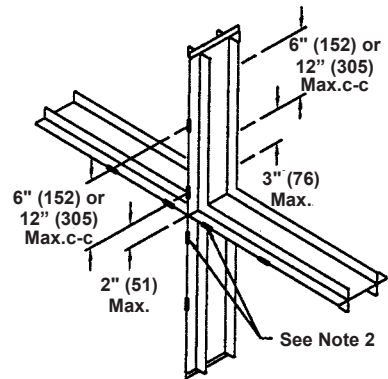


FIGURE 4

REINFORCING PLATE

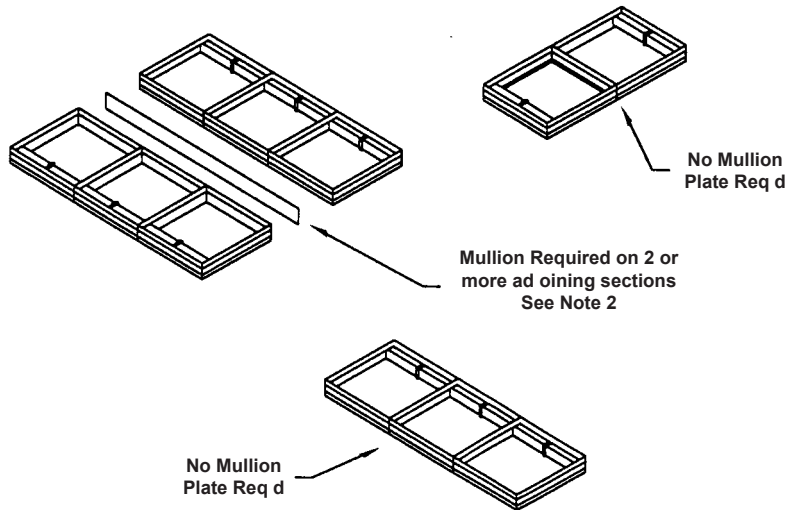


FIGURE 5

DIBD20-CUL, DIBD40-CUL AND DIBD60-CUL DYNAMIC CURTAIN FIRE DAMPER 1½ HOUR UL555 CLASSIFIED



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. w.g. (1 kPa).

Model IBDT series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (3225-0245:0005) DIBD20, 40, and 60
- **New York City** (MEA 252-05-E)

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.
- **Factory Sleeves** of various lengths and gauges to ensure
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) field compliance with UL installation requirements. and 285°F (141°C) are optional.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD20-CUL DIBD40-CUL DIBD60-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel spring clip type of horizontal mount only	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
DIBD20-CUL DIBD40-CUL DIBD60-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24"w x 24"h (610 x 610)	72"w x 48"h (1829 x 1219) 99"w x 24"h (2515 x 610) 48"w x 72"h (1219 x 1829)	36"w x 48"h (914 x 1219)

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



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IBD20-CUL, IBD40-CUL AND IBD60-CUL STATIC CURTAIN FIRE DAMPERS 1½ HOUR UL555 CLASSIFIED



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. IBD series dampers are classified as a static damper for use in an HVAC system that has the fans turn off during a fire.

Model IBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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

- Dynamic 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
 - 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 gauges to ensure
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) field compliance with UL installation requirements. and 285°F (141°C) are optional.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD20-CUL IBD40-CUL IBD60-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	1 ½

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD20-CUL IBD40-CUL IBD60-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 72"h (838 x 1829) 48"w x 30"h (1219 x 762) 36"w x 36"h (914 x 914)	33"w x 38"h (838 x 965) 30"w x 45"h (762 x 1143)	84"w x 72"h (2134 x 1829)	84"w x 91"h (2134 x 2311)

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



INSTALLATION INSTRUCTIONS 1½ HOUR UL CLASSIFIED CURTAIN TYPE (D)IBD20-CUL, (D)IBD40-CUL, and (D)IBD60-CUL FIRE DAMPERS WITH INTEGRAL SLEEVES

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.

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
- Mullions for Dampers in Oversized Wall Openings



SEE COMPLETE MARKING
ON PRODUCT

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 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 1/8" 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, 3/16" (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 gauge 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 gauge 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 by 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 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 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 gauge 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 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 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

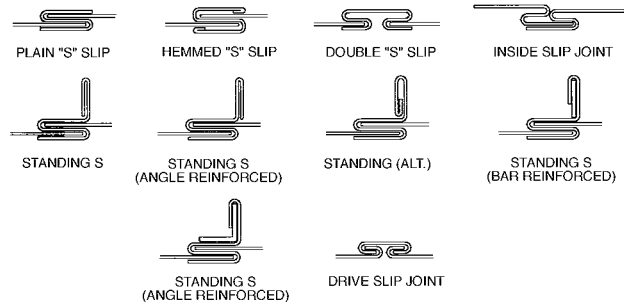
b. Mounting Angle Fastener Spacing

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:



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 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 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

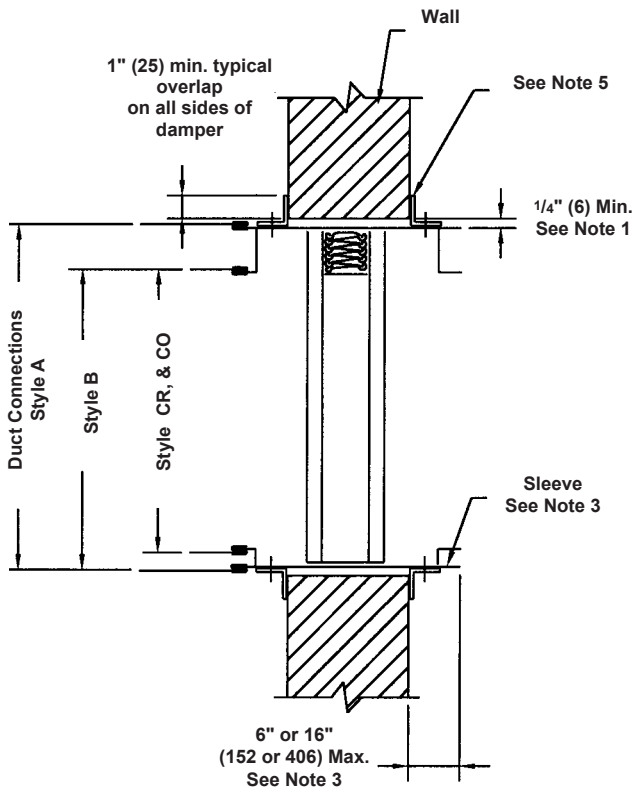
If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

7. Installation and Maintenance

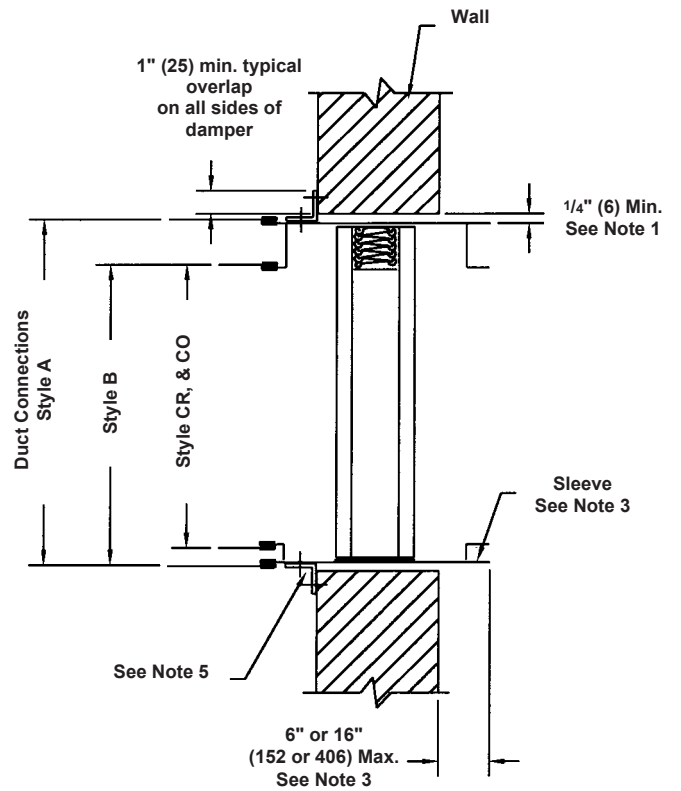
To ensure optimum operation and performance, the damper must be installed so it is square and free from racking. Each fire damper should be maintained and tested on a regular basis and in accordance with the latest editions of NFPA 90A and local codes. Care should be exercised to ensure that such tests 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

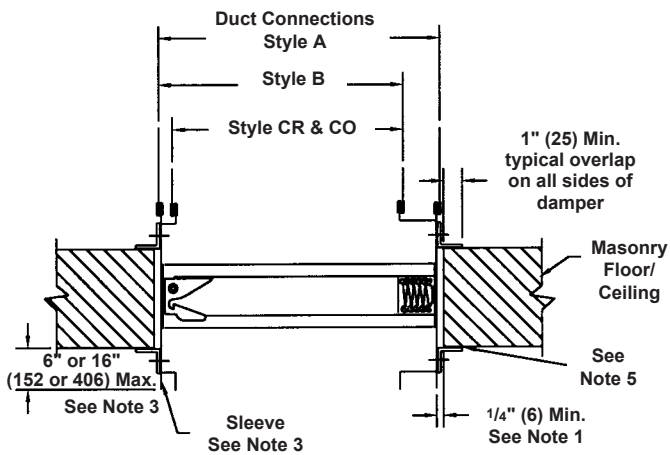


ONE ANGLE INSTALLATION

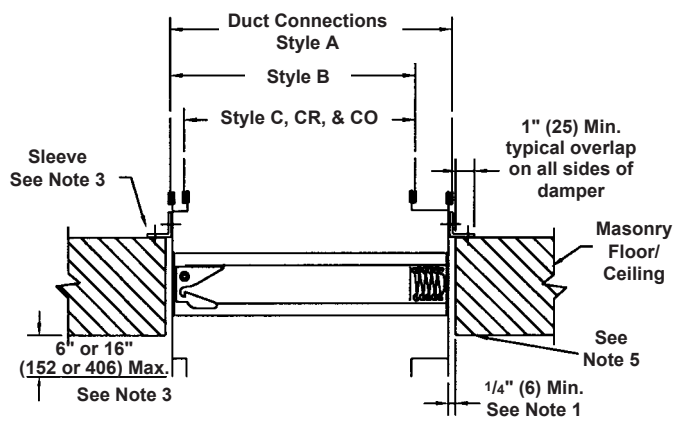
FIGURE 1

HORIZONTAL INSTALLATION

Damper is properly installed when leading edge of closed blades is within the wall.



TWO ANGLE INSTALLATION



ONE ANGLE INSTALLATION

FIGURE 2

FASTENER SPACING

VERTICAL INSTALLATION

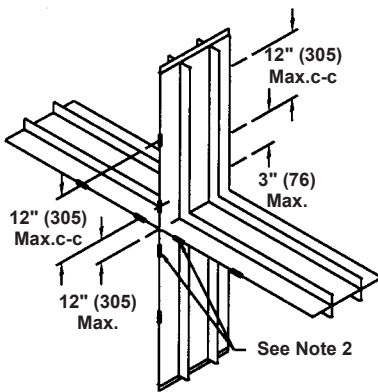


FIGURE 3

HORIZONTAL INSTALLATION

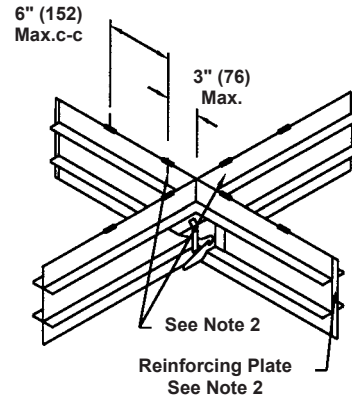


FIGURE 4

REINFORCING PLATE

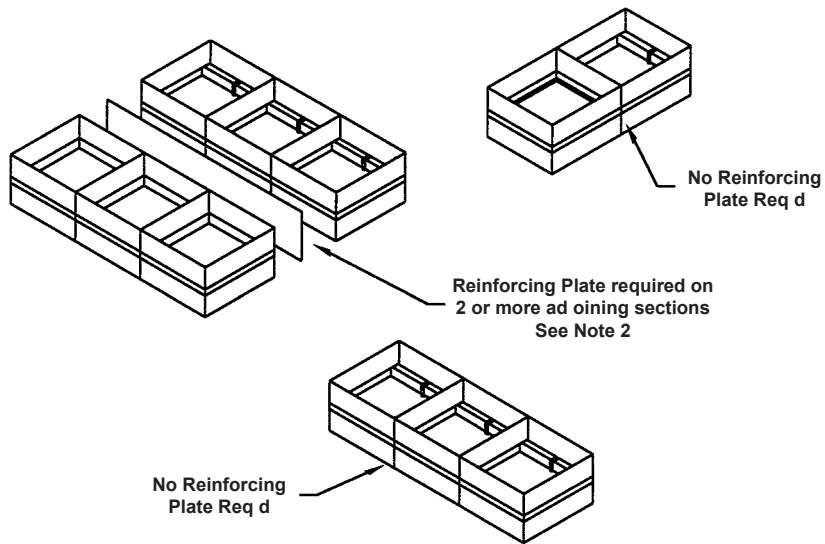
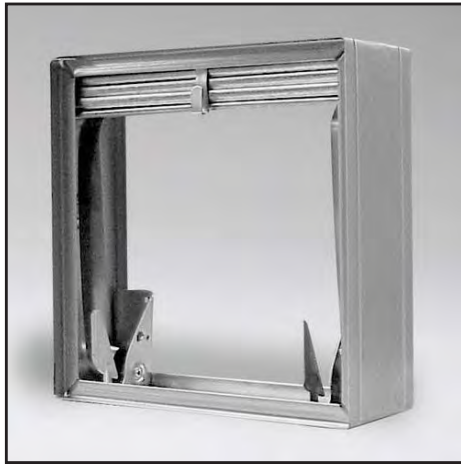


FIGURE 5

DIBD23-CUL AND DIBD23SS DYNAMIC CURTAIN FIRE DAMPER

3 HOUR UL555 CLASSIFIED



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 operation during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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
 - 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 gauges 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 gauges 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) optional.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD23-CUL	Galvanizes Steel (in gauges required by UL listing R5531)	Galvanizes Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	3
DIBD23SS-CUL	304/316 Stainless Steel (in gauges required by UL listing R5531)	304/316 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
DIBD23-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	33"w x 36"h (838 x 914)	24" w x 24"h (610 x 610)	72"w x 48"h (1829 x 1219)	36"w x 48"h (914 x 1219)
DIBD23SS-CUL			24" w x 24"h (610 x 610)		48"w x 72"h (1219 x 1829)	24"w x 24"h (610 x 610)

* 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.

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IBD23(SS)-CUL STATIC CURTAIN FIRE DAMPERS

3 HOUR UL555 CLASSIFIED



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 has the fans turn off during a fire.

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**
- **CSFM California State Fire Marshal**
Listing (3225-0245:0004) DIBD23 and DIBD23SS
- **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 gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD23-CUL	Galvanizes Steel (in gauges required by UL listing R5531)	Galvanizes Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	3
IBD23SS-CUL	304/316 Stainless Steel (in gauges required by UL listing R5531)	304/316 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
DIBD23-CUL DIBD23SS-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	36"w x 36"h (914 x 914)	30"w x 45"h (762 x 1143)	90"w x 72"h (2286 x 1829)	90"w x 91"h (2286 x 2311)

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

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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 45 1/2"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-CUL MAXIMUM SIZE

Single Section

Vertical Installation – 36"w x 36"h (914 x 914).

Horizontal Installation – 30"w x 45 1/2"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-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

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 1/8" 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

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 gauge 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 gauge 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 by 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 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 gauge 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

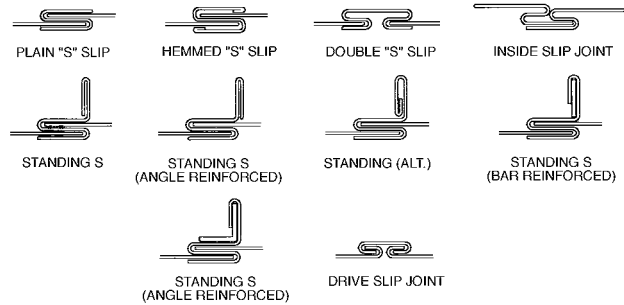
b. Mounting Angle Fastener Spacing

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:

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 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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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.

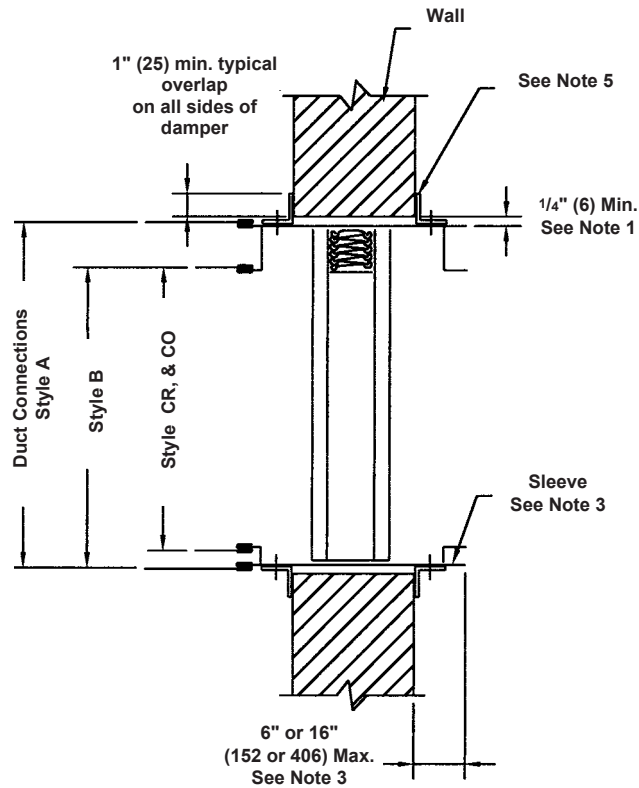


FIGURE 1

HORIZONTAL INSTALLATION

Damper is properly installed when leading edge of closed blades is within the floor.

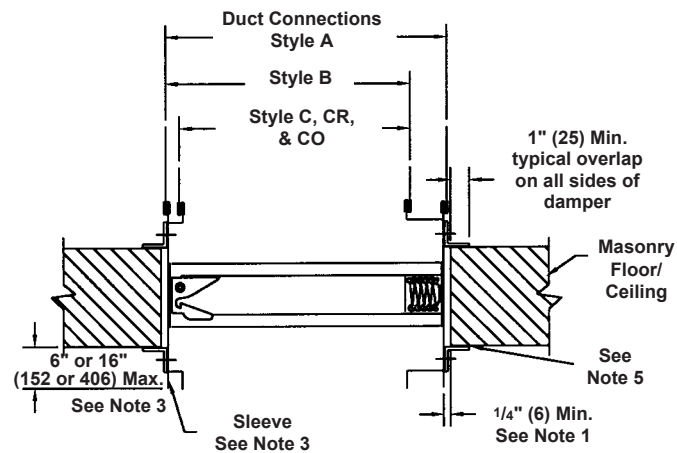


FIGURE 2

FASTENER SPACING

HORIZONTAL INSTALLATION

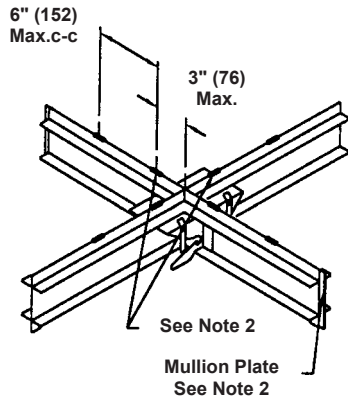


FIGURE 3

VERTICAL INSTALLATION

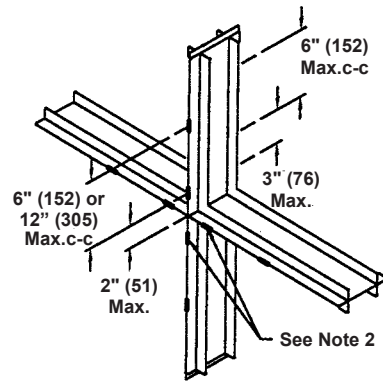


FIGURE 4

REINFORCING PLATE

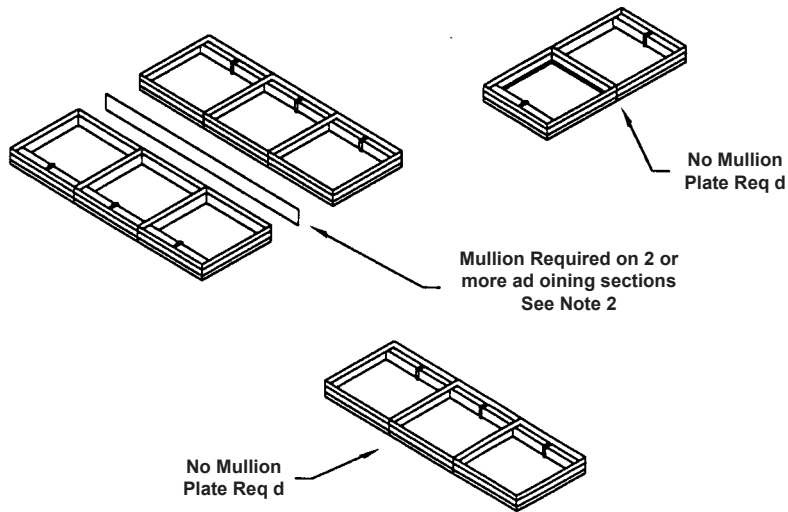


FIGURE 5

DIBD230-CUL, DIBD430-CUL AND DIBD630-CUL DYNAMIC CURTAIN FIRE DAMPERS 3 HOUR UL555 CLASSIFIED



APPLICATION

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 operation during a fire. DIBD series have a dynamic closure rating up to 4000 fpm (20.3 m/s) and 4 in. w.g. (1 kPa).

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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 facility.

FRAME - SLEEVE LENGTHS

- DIBD230-CUL - 12" (305) long
- DIBD430-CUL - 14" (356) long
- DIBD630-CUL - 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.
- **Factory Sleeves** of various lengths and gauges 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 gauges 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

Damper	Frame	Blades	Closure Springs	Hourly Rating
DIBD230-CUL DIBD430-CUL DIBD630-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	3

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
DIBD230-CUL					72" w x 48" h (1829 x 1219)	
DIBD430-CUL	4" w x 4" h (102 x 102)	6" w x 6" h (152 x 152)	33" w x 36" h (838 x 914)	24" w x 24" h (610 x 610)	99" w x 24" h (2515 x 610)	36" w x 48" h (914 x 1219)
DIBD630-CUL					48" w x 72" h (1219 x 1829)	

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

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IBD230-CUL, IBD430-CUL and IBD630-CUL DYNAMIC CURTAIN FIRE DAMPERS 3 HOUR UL555 CLASSIFIED



APPLICATION

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 has the fans turn off during a fire.

Model DIBD series meets the requirements for fire dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, and 101.
- **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

- 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" (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 gauges also for two-side installation.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) optional.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
IBD230-CUL IBD430-CUL IBD630-CUL	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 Stainless Steel constant force or spring clip type	3

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size		Maximum Single Section		Maximum Multiple Section	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
IBD230-CUL IBD430-CUL IBD630-CUL	4"w x 4"h (102 x 102)	6"w x 6"h (152 x 152)	36"w x 36"h (914 x 914)	30"w x 45"h (762 x 1143)	84"w x 72"h (2134 x 1829)	84"w x 91"h (2134 x 2311)

* 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 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-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



SEE COMPLETE MARKING
ON PRODUCT

California State Fire Marshal Listing No. 3225-245:004

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 1/8" 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

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 gauge 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 gauge 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 by 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 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 gauge 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

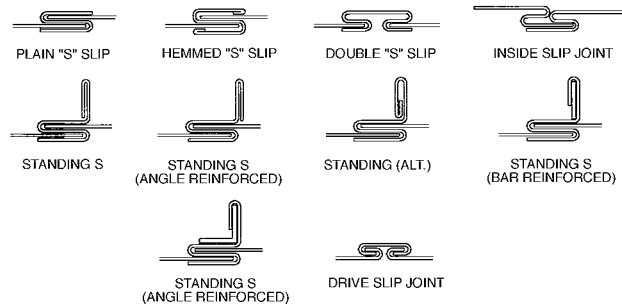
b. Mounting Angle Fastener Spacing

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:

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 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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.

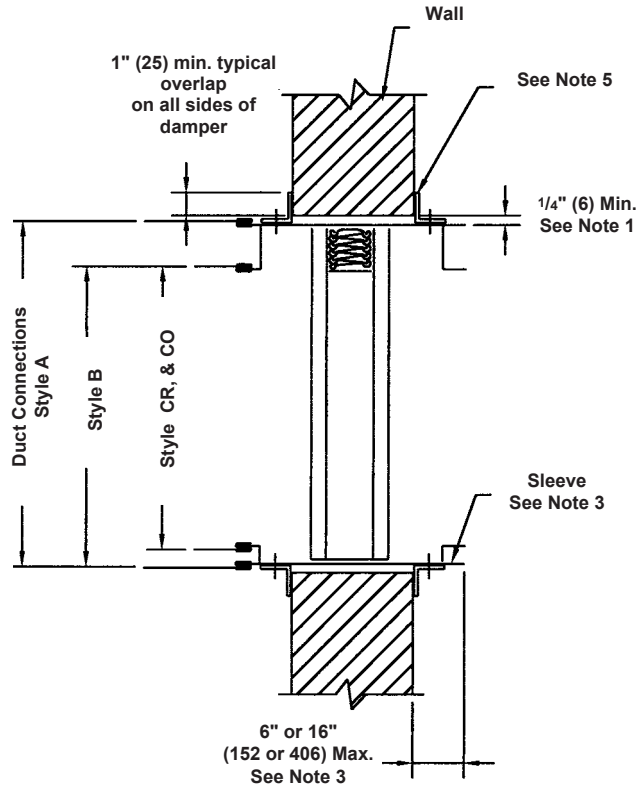


FIGURE 1

HORIZONTAL INSTALLATION

Damper is properly installed when leading edge of closed blade is within the wall.

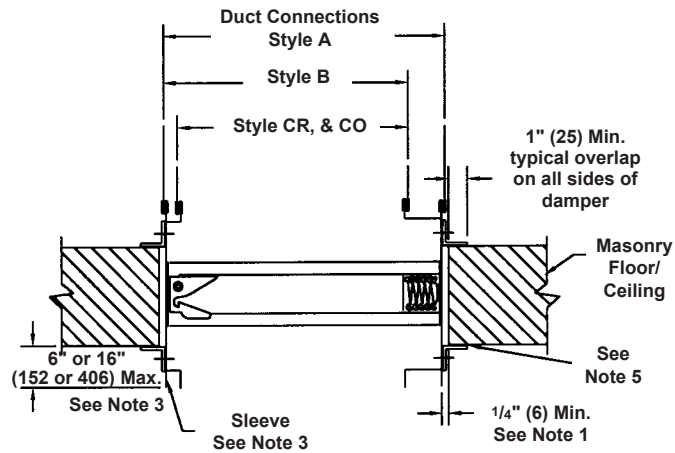


FIGURE 2

FASTENER SPACING

VERTICAL INSTALLATION

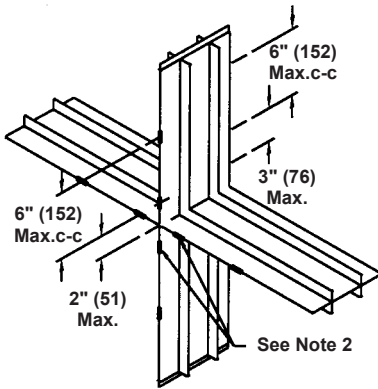


FIGURE 3

HORIZONTAL INSTALLATION

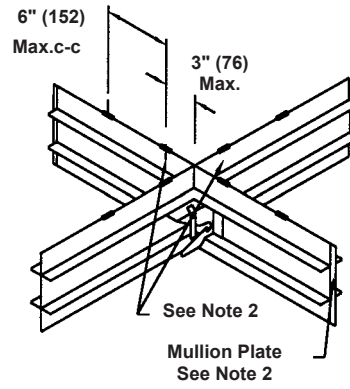


FIGURE 4

REINFORCING PLATE

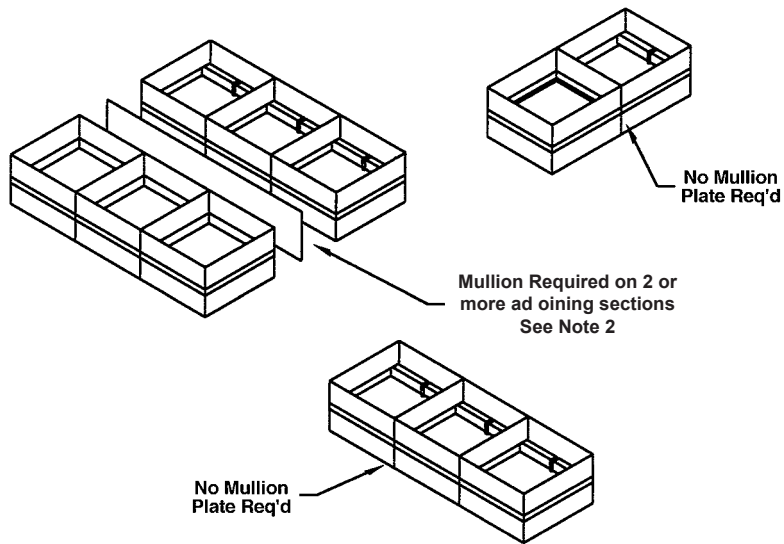


FIGURE 5

“Grille Access” FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



APPLICATION

Ruskin Grille Access “GA” series fire dampers designed to be installed from the grille side of the wall and the blades are out side 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

GA Models meets the requirements for fire dampers established by:

- **National Fire Protection Association NFPA Standards** 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**

SPECIFICATIONS				
Damper	Frame	Blades	Closure Springs	Hourly Rating
(D)FD60GA	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge galvanized steel equivalent thickness.	301 stainless steel	1 ½
(D)FD35GA	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	6" (152) wide and 16 (1.6) gauge galvanized steel.		
(D)FD35SS/GA	5" x 16 gauge (127 x 1.6) stainless steel, single piece, hat-shaped channel.	6" (152) wide and 16 (1.6) gauge stainless steel.		
(D)IBD2/GA	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type (where applicable)	
(D)IBD2SS/GA	304 Stainless Steel (in gauges required by UL listing R5531)	304 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES*					
Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
All Models	6"w x 6"h (152 x 152)	36"w x 36"h (914 x 914)	N/A	N/A	N/A

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

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INSTALLATION INSTRUCTIONS (D)IBD2GA AND (D)IBD2SSGA FIRE DAMPERS 1 1/2 HOUR UL CLASSIFIED RATING

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

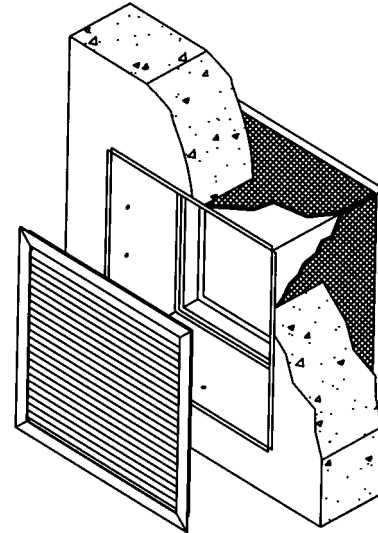
Vertical Installation – 36"w x 36"h (914 x 914)

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 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) 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 gauge 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 by 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 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 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).

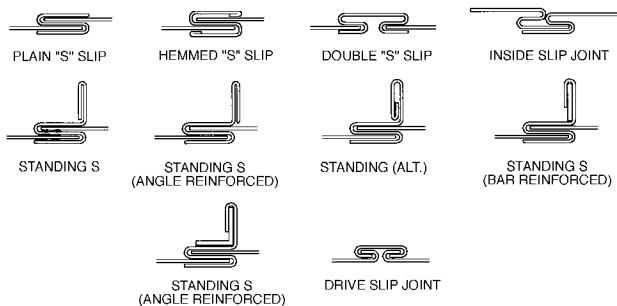
6. Mounting Angles

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 Connections

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 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 comers. See Flanged System Breakaway Connections Installation Instruction Supplement for details.

d. Non-Break-Away Duct/Sleeve Connections

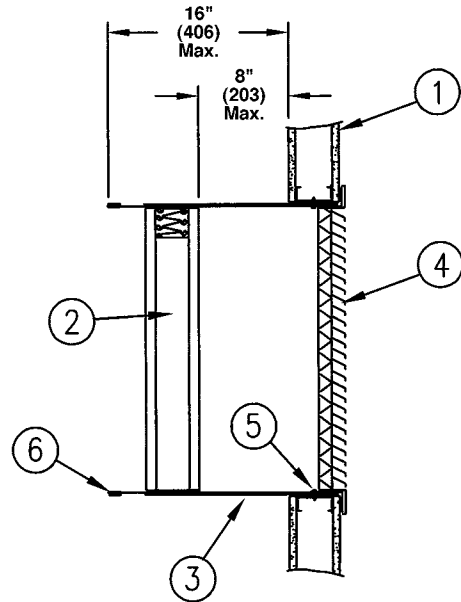
If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

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

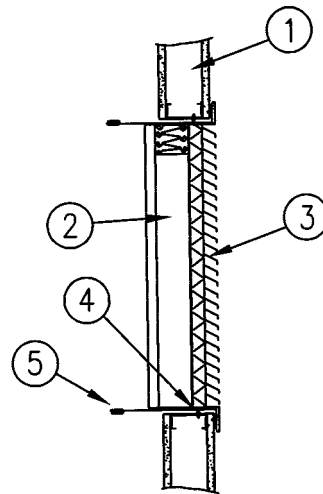
ITEM	DESCRIPTION
1.	Wall: steel or wood stud or masonry
2.	Damper
3.	1/4" (6) thick insulation (Factory Installed)
4.	Grille – "By Others"
5.	Fasteners – See Note #5
6.	Duct/Sleeve connection



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.

ITEM	DESCRIPTION
1.	Wall: steel or wood stud or masonry
2.	Damper
3.	Grille – "By Others"
4.	Fasteners – See Note #5
5.	Duct/Sleeve connection



INSTALLATION INSTRUCTIONS (D)FD35GA, (D)FD35SSGA, AND (D)FD60GA 1½ HOUR UL CLASSIFIED RATING

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 –

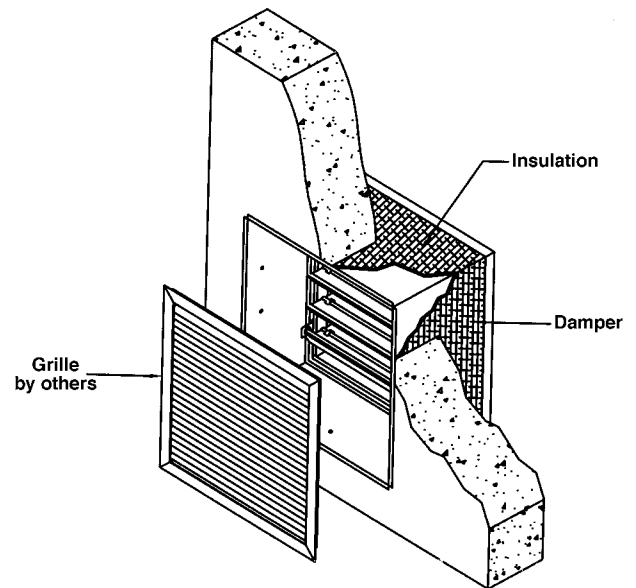
Single section vertical installation
32"w x 36"h (813 x 914)

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



SEE COMPLETE MARKING
ON PRODUCT

California State Fire Marshal Listing No.

FD35GA – 3225-0245:0005

FD35SSGA – 3225-0245:0005

FD60GA – 3225-0245:0004

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. 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 gauge 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 by 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 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 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).

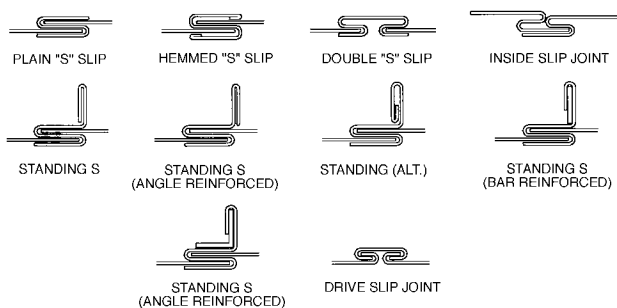
6. Mounting Angles

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 Connections

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 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 comers. See Flanged System Breakaway Connections Installation Instruction Supplement for details.

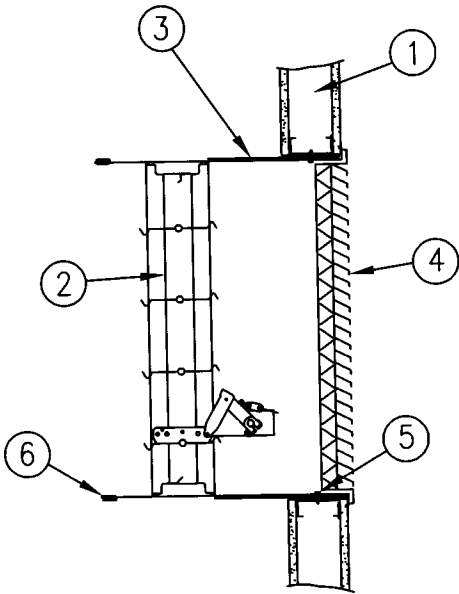
d. Non-Break-away Duct/Sleeve Connections

If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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.

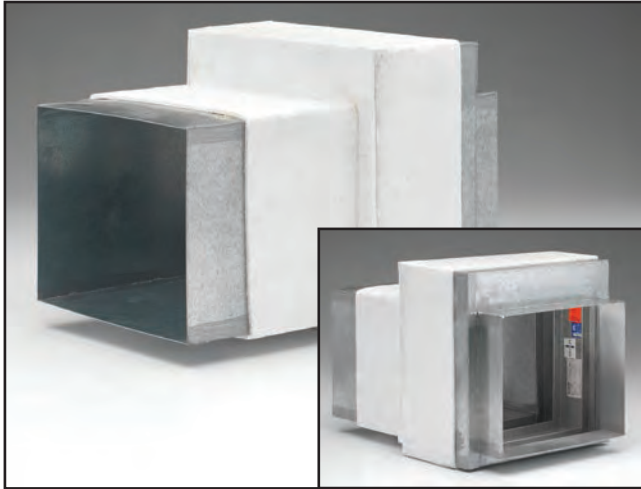
INSTALLATIONS



ITEM	DESCRIPTION
1.	Wall: steel or wood stud or masonry
2.	Damper
3.	1/4" (6) thick insulation (Factory Installed)
4.	Grille – "By Others"
5.	Fasteners – See Note #5
6.	Duct/Sleeve connection

“Out of Wall (OW) FIRE DAMPERS

1½ HOUR UL555 CLASSIFIED



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.

OW Models meets the requirements for fire dampers established by:

- **National Fire Protection Association NFPA Standards** 80, 90A, 92A, 92B, and 101.
- **ICC International Building Codes**

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
(D)FD60/OW	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	One-piece airfoil, nominal 6" (152) wide and 14 (2.0) gauge galvanized steel equivalent thickness.	301 stainless steel	1 ½
(D)FD35/OW	5" x 16 gauge (127 x 1.6) galvanized, single piece, hat-shaped channel.	6" (152) wide and 16 (1.6) gauge galvanized steel.		
(D)FD35SS/OW	5" x 16 gauge (127 x 1.6) stainless steel, single piece, hat-shaped channel.	6" (152) wide and 16 (1.6) gauge stainless steel.		
(D)IBD2/OW	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel constant force or spring clip type (where applicable)	
(D)IBD2SS/OW	304 Stainless Steel (in gauges required by UL listing R5531)	304 Stainless Steel (in gauges required by UL listing R5531)		

MAXIMUM UL CLASSIFIED DAMPER SIZES*

Damper	Minimum Size	Maximum Single Section		Maximum Multiple Section	
		Vertical	Horizontal	Vertical	Horizontal
All Models	6"w x 6"h (152 x 152)	36"w x 36"h (914 x 914)	N/A	N/A	N/A

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

RUSKIN®



Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

INSTALLATION INSTRUCTIONS (D)IBD2/OW and (D)IBD2SS/OW FIRE DAMPERS 1½ HOUR UL CLASSIFIED RATING

APPLICATION

The DIBD2/OW and DIBD2SS/OW dynamic fire dampers are for use in dynamic (fans on) or static (fans off) systems. The IBD2/OW and IBD2SS/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 – 36"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

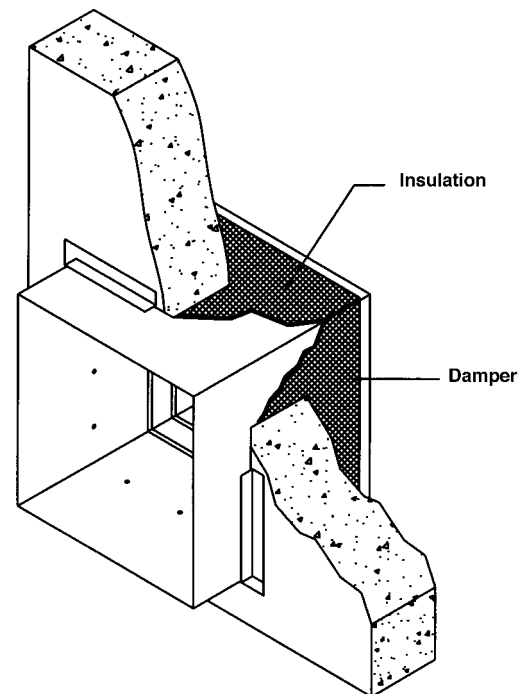
Horizontal Installation – 36"w x 36"h (914 x 914)

Dimensions shown in parentheses () indicate millimeters.

INSTALLATION SUPPLEMENTS

Refer to the appropriate Ruskin installation instructions supplements for special requirements:

- S-and-Drivemate No. 14880
- Flanged System Breakaway Connections
- Optional Sealant of Dampers in Fire Rated Walls or Floors



SEE COMPLETE MARKING
ON PRODUCT

California State Fire Marshal Listing No. 3225-0245:0005

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) 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 gauge 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 by 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 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

- 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
- 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 1/2" (13).
In wood stud walls use minimum #10 (M5) screws. Screw must engage the wood a minimum of 3/4" (19).
- 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.

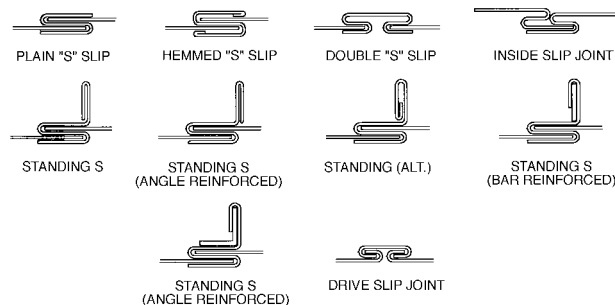
6. Mounting Angles

- Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 20 . 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.
- 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.
- 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.
- 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 1/2" x 1 1/2" x 20 gauge 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 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 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.

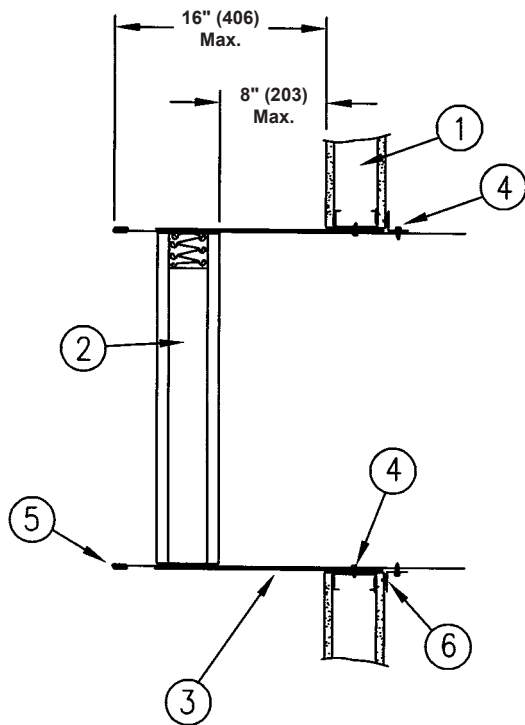
d. Non-Break-Away Duct/Sleeve Connection

If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

8. Installation and Maintenance

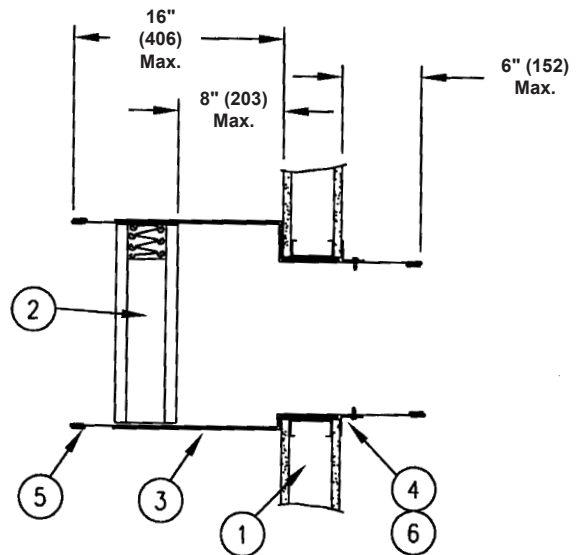
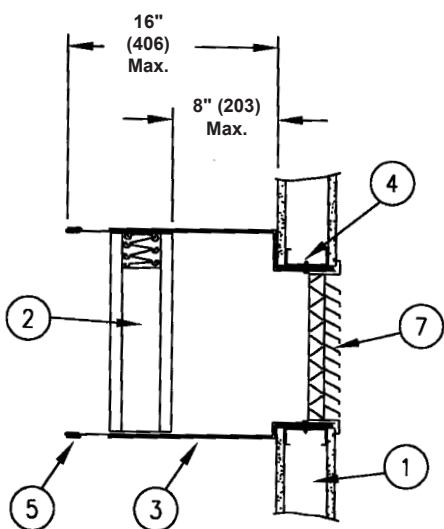
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Dampers must be maintained, cycled, and tested in accordance with local codes and recognized standards or publications like: NFPA 80, 90A, 101, etc.

VERTICAL INSTALLATION

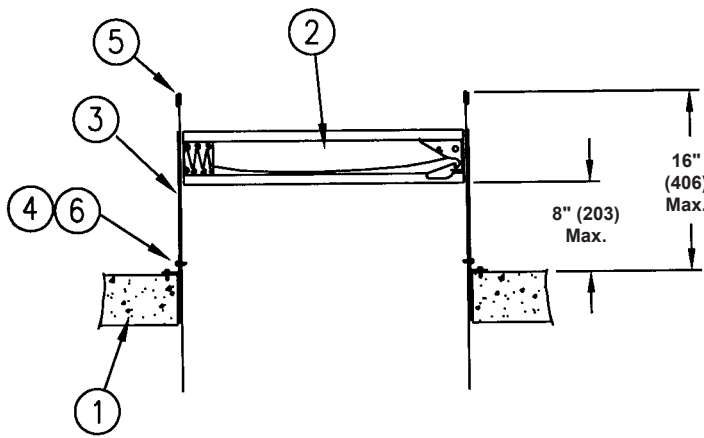


ITEM	DESCRIPTION
1.	Wall: steel or wood stud or masonry
2.	Damper
3.	1/4" (6) thick insulation (Factory Installed)
4.	Fasteners – See Note #5
5.	Duct/Sleeve connection
6.	Mounting Angles – See Note #6
7.	Grille (By Others) Optional

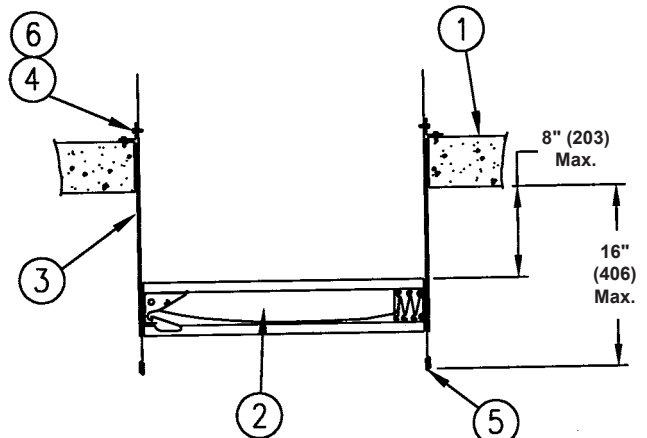
OPTIONAL VERTICAL INSTALLATION



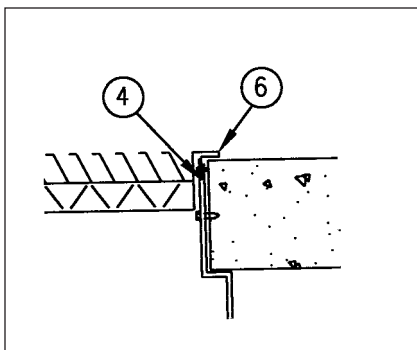
HORIZONTAL INSTALLATION



Above Floor



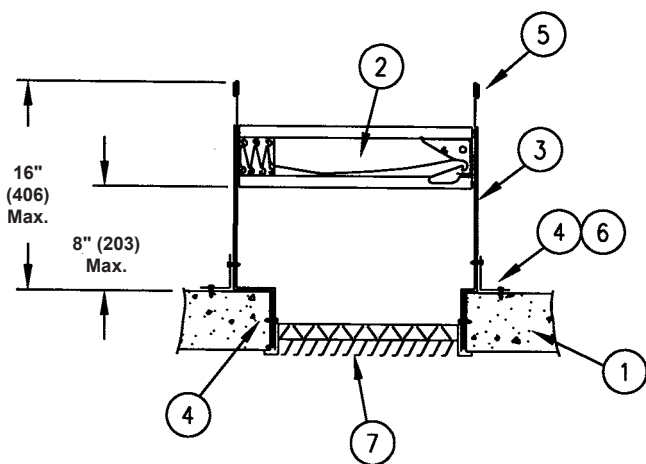
Below Floor



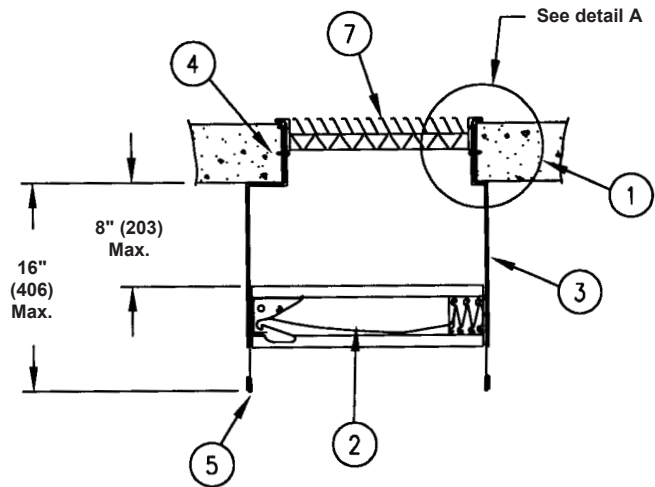
DETAIL A

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



Above Floor



Below Floor

INSTALLATION INSTRUCTIONS (D)FD35/OW, (D)FD35SS/OW AND (D)FD60/OW FIRE DAMPER 1½ HOUR UL CLASSIFIED RATING

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 –

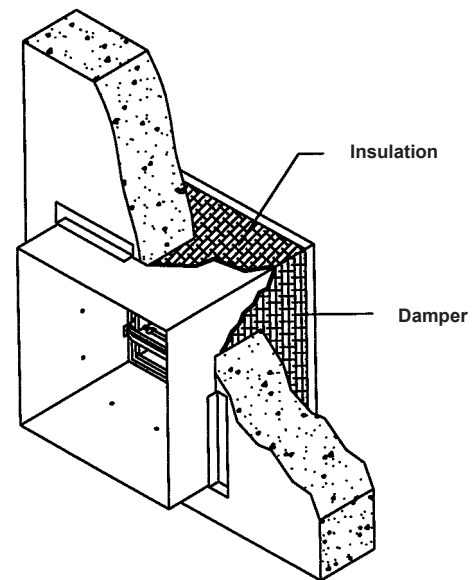
Single section vertical and horizontal installation
30"w x "h (762 x 914)
Multiple section vertical and horizontal installation
36"w x 36"h (914 x 914)

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 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) 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 gauge 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 by 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 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 1/2" (38).

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 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 gauge 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.

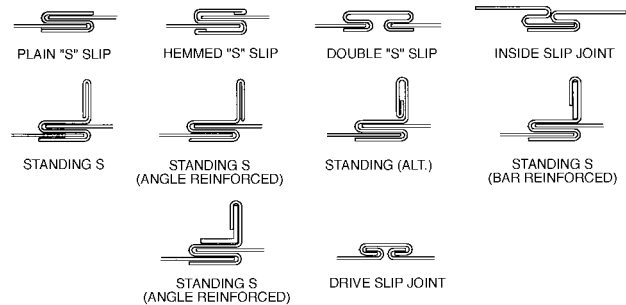
c. Optional installation where the damper is larger than the opening in the floor and the damper is mounted on the top side of the floor, the mounting angle is not required and the damper is to be fastened to the floor from the inside of the damper sleeve. Mounting angles may be used but are not required.

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, 1 1/2" x 1 1/2" x 20 gauge 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 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 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.

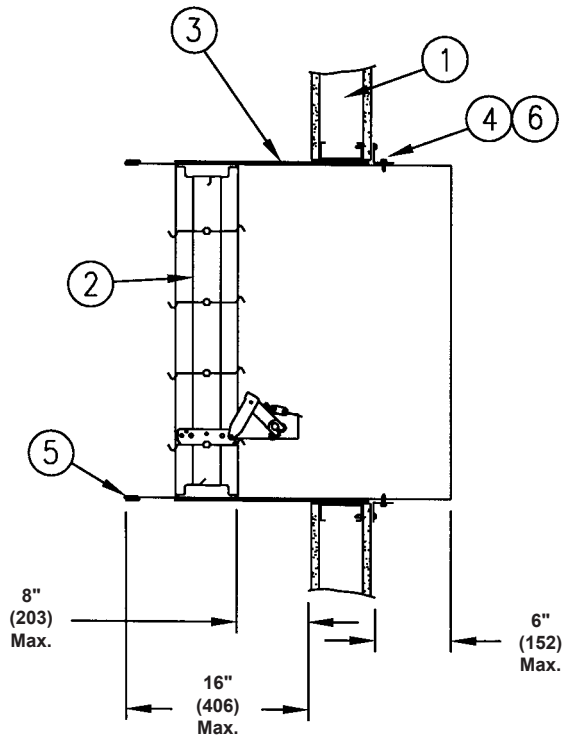
d. Non-Break-Away Duct/Sleeve Connection

If other duct/sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers larger than 36" (914) wide x 24" (610) high.

8. Installation and Maintenance

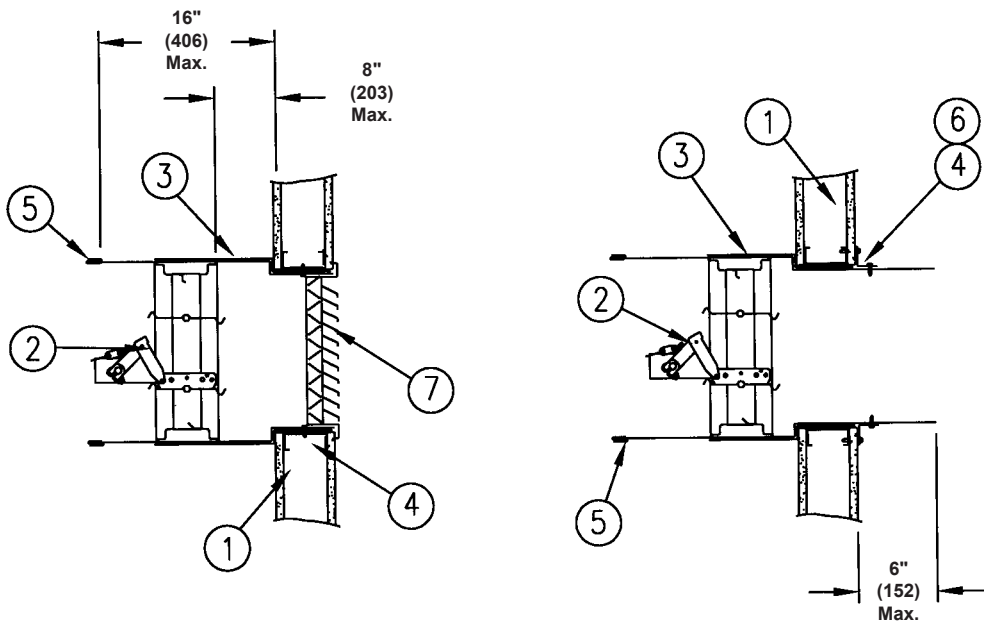
Install dampers so they are square and free from racking. Do not compress or stretch damper frames into the duct or opening. Dampers must be maintained, cycled, and tested in accordance with local codes and recognized standards or publications like: NFPA 80, 90A, 101, etc.

VERTICAL INSTALLATION

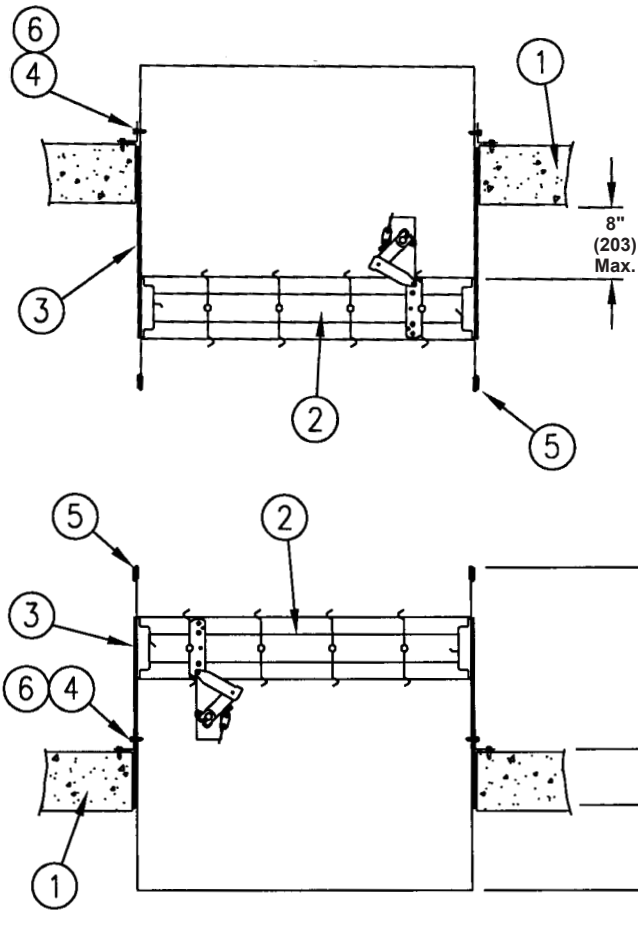


ITEM	DESCRIPTION
1.	Wall: steel or wood stud or masonry
2.	Damper
3.	1/4" (6) thick insulation (Factory Installed)
4.	Fasteners – See Note #5
5.	Duct/Sleeve connection
6.	Mounting Angles – See Note #6
7.	Grille (By Others) Optional

OPTIONAL VERTICAL INSTALLATION

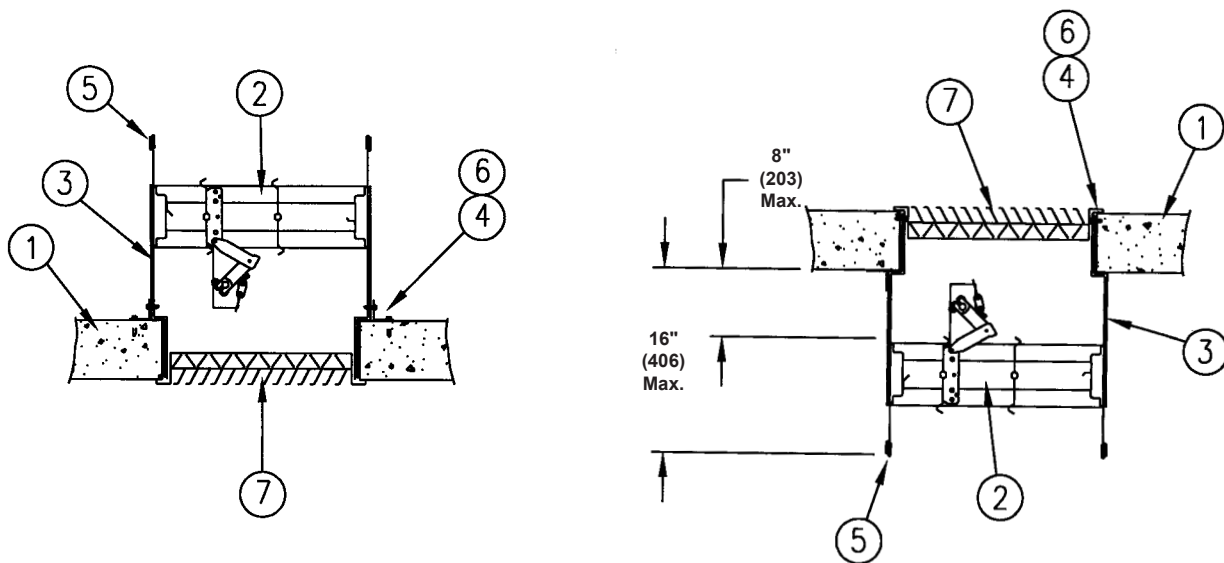


HORIZONTAL INSTALLATION



ITEM	DESCRIPTION
1.	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 HORIZONTAL INSTALLATION



FIRE AND COMBINATION FIRE SMOKE DAMPERS FOR GRILLE MOUNTING

1½ HOUR UL555 CLASSIFIED



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 gauges to ensure field compliance with UL installation requirements.
- **Fusible Links** 165°F (74°C) is standard. 212°F (100°C) and 285°F (141°C) are optional

Models meets the requirements for combination fire and smoke dampers established by:

- **National Fire Protection Association** NFPA Standards 80, 90A, 92A, 92B, 101 and 105.
- **ICC International Building Codes**
- **New York City** (MEA 252-05-E)

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
All Models	Galvanized Steel (in gauges required by UL listing R5531)	Galvanized Steel (in gauges required by UL listing R5531)	301 stainless steel When Required	1½

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size**		Maximum Single Section		Maximum Multiple Section**	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal**
DIBD2G	4" x 4" (102 x 102)	6" x 6" (152 x 152)	33" x 36" (838 x 914)	24" x 24" (610 x 610)	72" x 48" (1828 x 1219)	N/A
DIBD20G	6" x 6" (152 x 152)				33" x 36" (838 x 914)	N/A
IBD2G	4" x 4" (102 x 102)		36" x 36" (914 x 914)	33" x 38" (838 x 965)	90" x 48" (2286 x 1219)	90" x 48" (2286 x 1219)
IBD20G	6" x 6" (152 x 152)				33" x 38" (838 x 965)	N/A
DIBD2SSG	6" x 6" (152 x 152)		24" x 24" (610 x 610)	24" x 24" (610 x 610)	72" x 48" (1828 x 1219)	N/A
IBD2SSG	6" x 6" (152 x 152)				36" x 36" (914 x 914)	33" x 38" (838 x 965)
(D)FD35G	8" x 6" (203 x 152)	8" x 6" (203 x 152)	36" x 48" (914 x 1219)	36" x 48" (914 x 1219)	90" x 48" (2286 x 1219)	90" x 48" (2286 x 1219)
(D)FD60G			32" x 48" (813 x 1219)	30" x 48" (762 x 1219)		
FSD36G			36" x 48" (914 x 1219)	36" x 48" (914 x 1219)		
FSD60G			32" x 48" (813 x 1219)	30" x 48" (762 x 1219)		

*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.

RUSKIN®

Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)



INSTALLATION INSTRUCTIONS
(D)IBD2G, (D)IBD2SSG, (D)IBD20G, IBDTG
CURTAIN TYPE FIRE DAMPERS FOR GRILLE MOUNTING
1 1/2 HOUR UL555 CLASSIFIED

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 (838 x 1219) or 36"w x 36"h (914 x 914).

Horizontal – 30"w x 45 1/2"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 (838 x 1219) or 36"w x 36"h (914 x 914).

Horizontal – 30"w x 45 1/2"h (762 x 1156) or 33"w x 38"h (838 x 965).

MODEL IBDTG, IBDT1G and IBDT2G 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 DIBDX2G 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).

Multiple Section Assembly

Vertical – 72"w x 48"h (1829 x 1219) or 48"w x 72"h (1219 x 1829).

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



SEE COMPLETE MARKING
ON PRODUCT

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 $\frac{1}{8}$ " (3) ($\frac{3}{16}$ " for stn. stl.) per foot (3 per 305), nor shall be less than $\frac{1}{4}$ " (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, $\frac{3}{16}$ " (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 gauge thick x $4\frac{1}{2}$ " (2 x 114) wide steel reinforcing plate sandwiched between the damper frames with No. 10 (M5) bolts or screws, $\frac{3}{16}$ " (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 connected to it. Sleeve gauge 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) 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 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 $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x 20 gauge 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 Termination" installation supplement.

a. Mounting Angle Fasteners

Sleeve: #10 bolts or screws, $\frac{3}{16}$ " (3) steel rivets or $\frac{1}{2}$ " (13) long or welds.

Masonry/Wall or Floor: #10 self-tapping concrete screws.

Wood/Steel Stud Wall: #10 screws

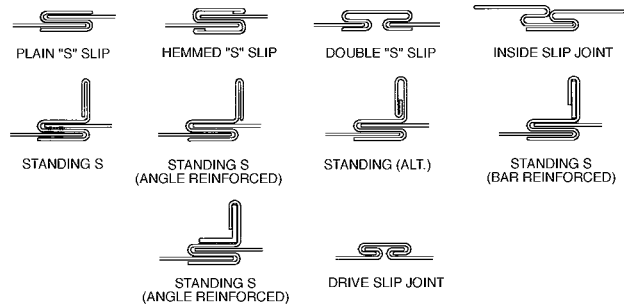
b. Mounting Angle Fastener Spacing

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 $\frac{1}{2}$ " (13). Screw fasteners used in wood stud must engage the wood a minimum of $\frac{3}{4}$ " (19). Screw fasteners used in masonry walls or floors must engage the wall a minimum of $1\frac{1}{2}$ " (38).

6. Duct/Sleeve Connections

a. Break-Away Duct/Sleeve Connections

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



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 connections when installed as shown on the "Flanged System Breakaway Connections Supplement."

TDC and TDF roll-formed flanged connections using $\frac{3}{8}$ " (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."

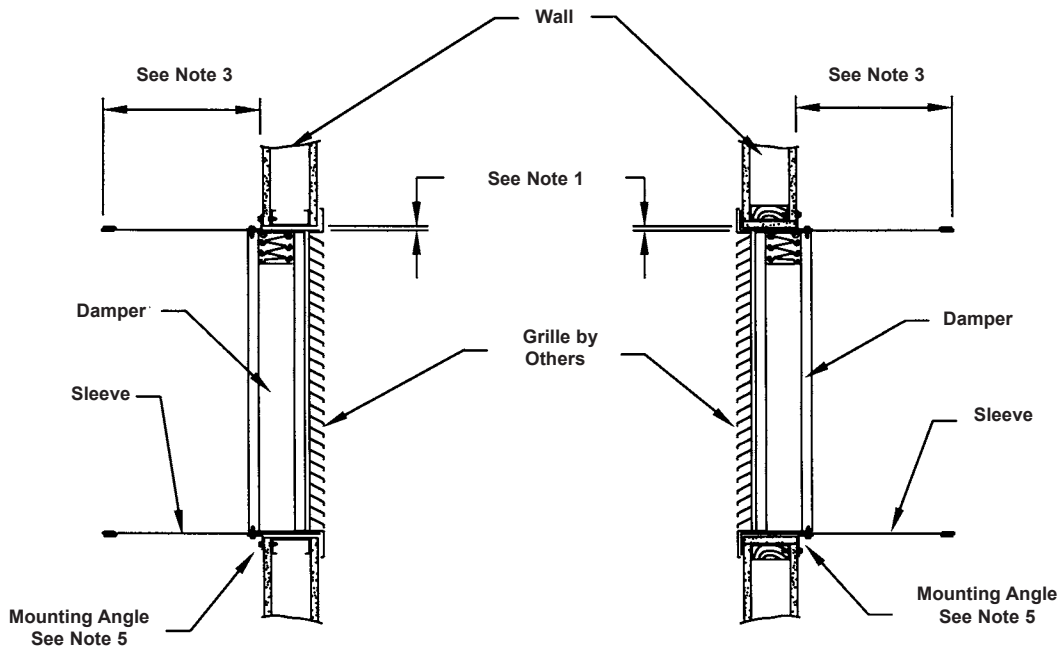
d. Non-Break-Away Duct/Sleeve Connections

If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (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



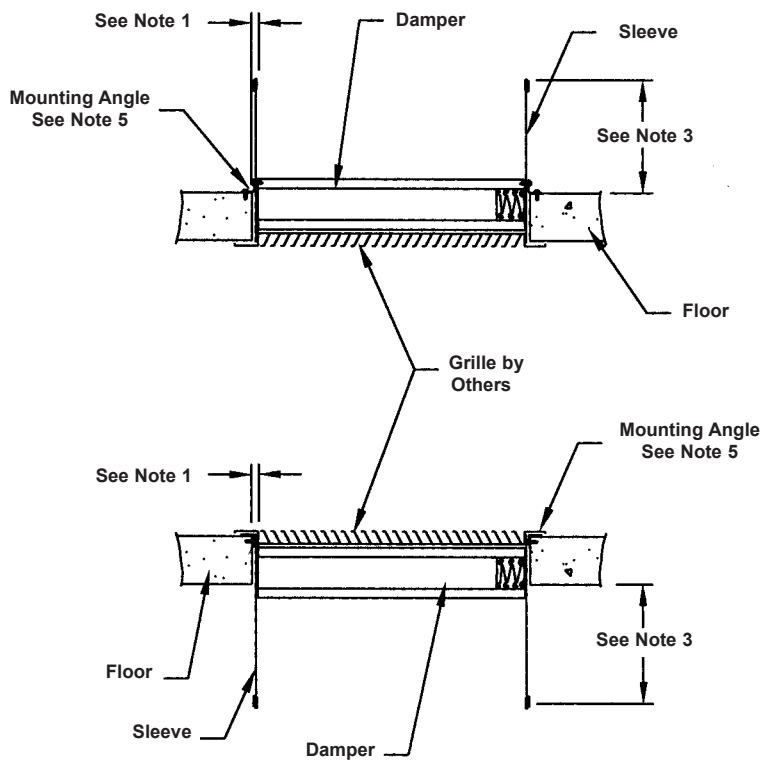
STEEL STUD or MASONRY WALLS

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



FASTENER SPACING

HORIZONTAL INSTALLATION

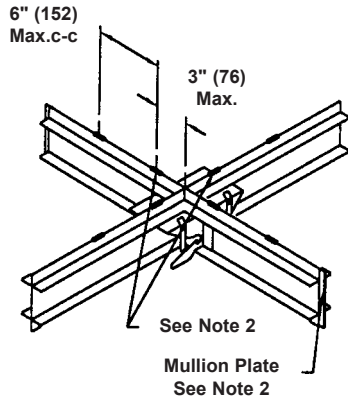


FIGURE 1

VERTICAL INSTALLATION

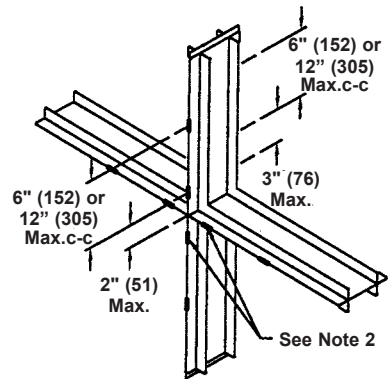


FIGURE 2

REINFORCING PLATE

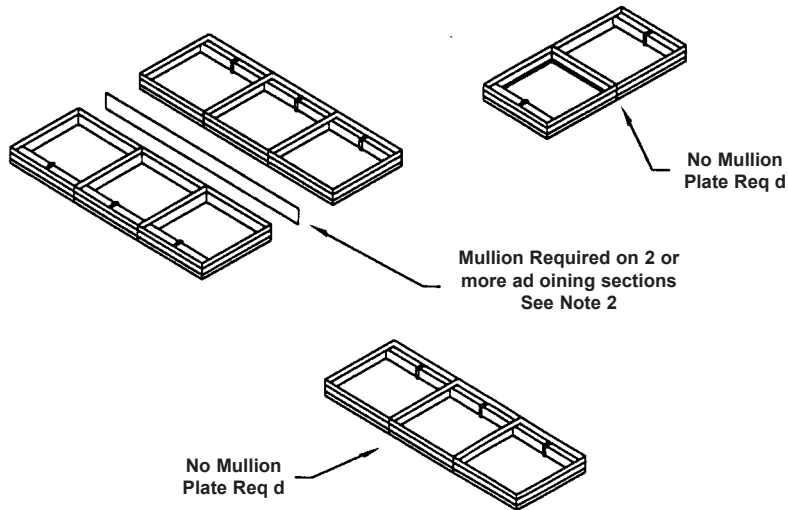


FIGURE 3

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
3 SIDE ANGLE INSTALLATION

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
1 1/2 HOUR UL CLASSIFIED DAMPERS WITH GRILLE MOUNTING ANGLES
FIRE AND COMBINATION FIRE AND SMOKE DAMPER INSTALLATION IN CONCRETE FLOOR
WITH STEEL DECK

INSTRUCTION INSTRUCTIONS SUPPLEMENT RECOMMENDED FRAMING FOR OPENINGS IN WOOD AND METAL STUD WALLS

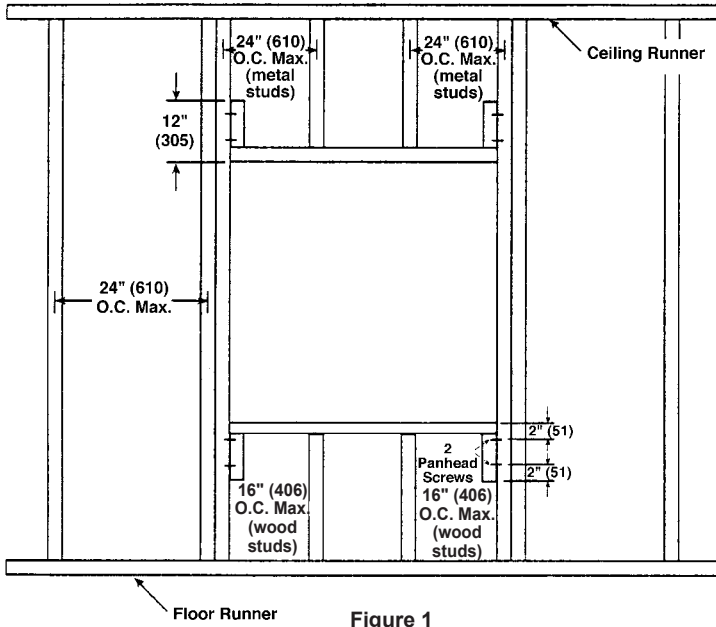


Figure 1

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.

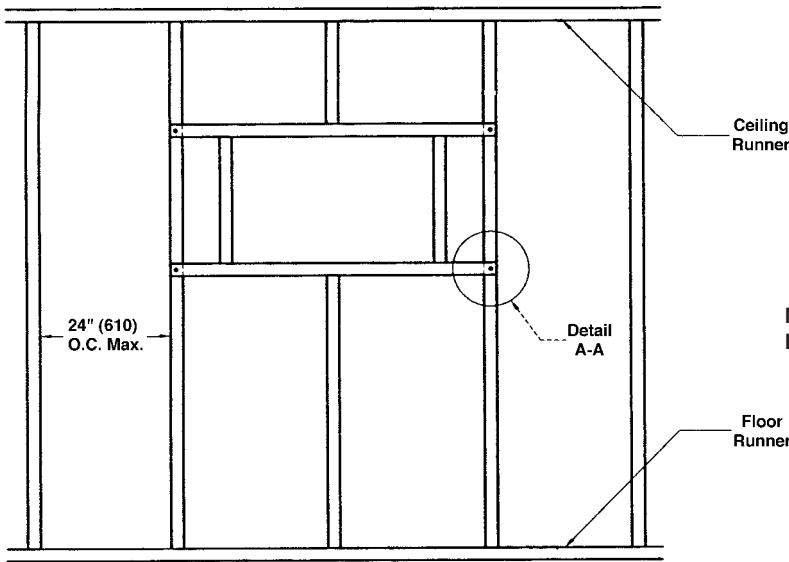
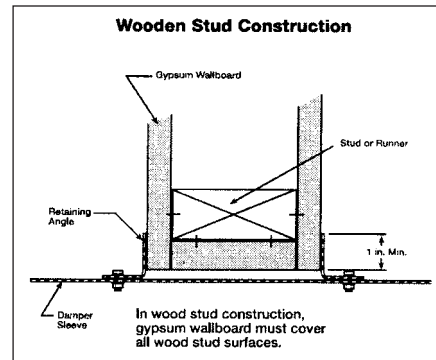
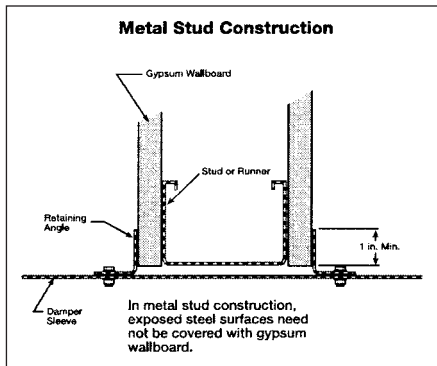
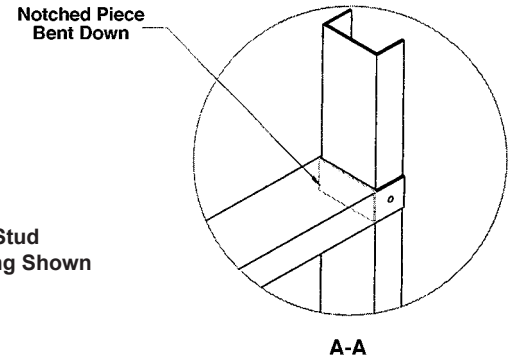


Figure 2



RUSKIN®



CAVITY SHAFT WALL METAL STUD FRAMING INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATION

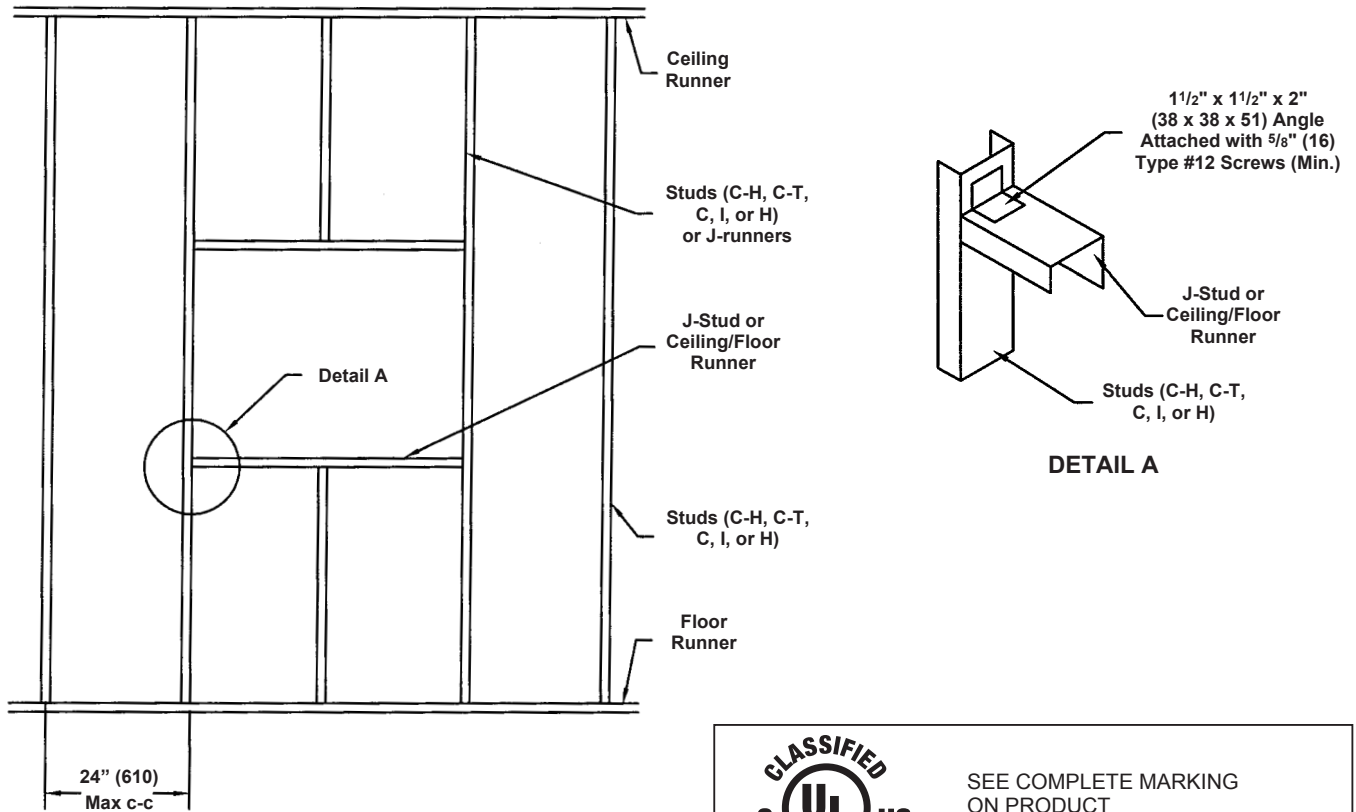
These installations are for all fire and combination fire and smoke damper installations in cavity shaft wall partitions and apply to the following wall design numbers as detailed in the UL fire Resistance directory: U415, U437, U438, U467, U469 and U497.

GENERAL INSTALLATION NOTES

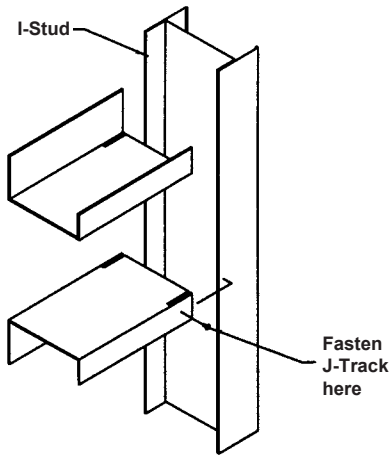
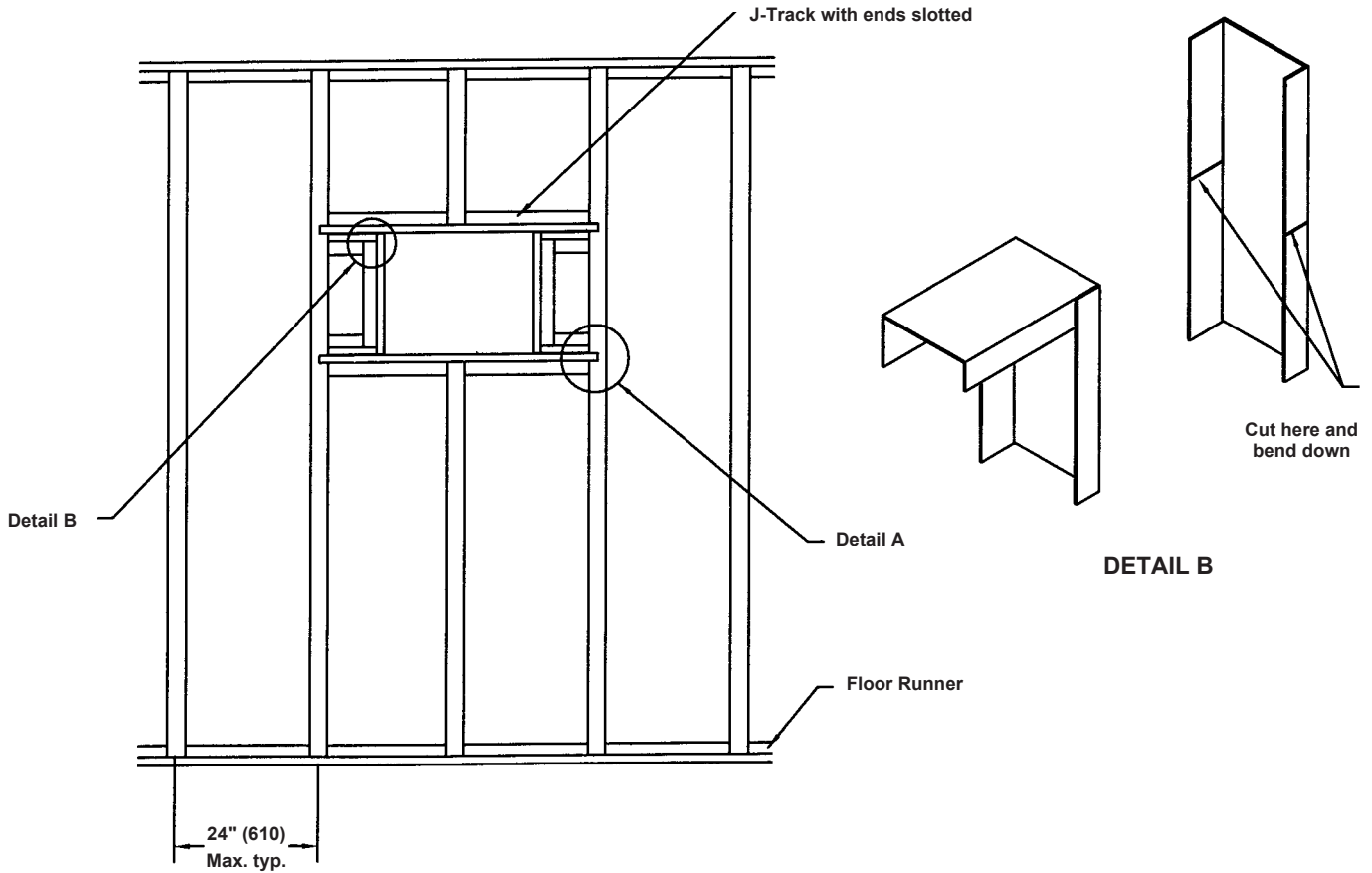
1. Refer to the installation instructions for the specific damper model for installation details.
2. Gypsum panels must be screwed 12" (305) O.C. maximum to all stud and runner flanges surrounding opening (see framing details).
3. See the appropriate damper installation for the Opening Size, Fasteners, Fastener Spacing and Mounting Angles.

FRAMING DETAILS

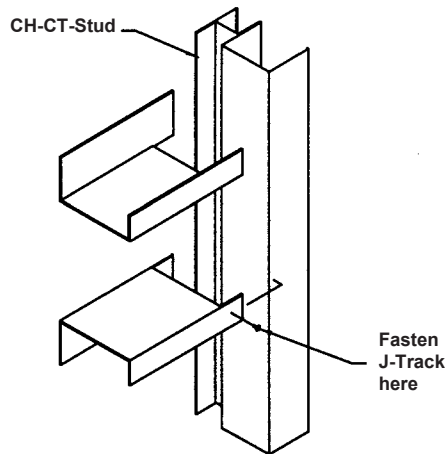
Note: Shaft wall construction may utilize C, E, H, I, J, C-H or C-T stud wall construction.



FRAMING DETAILS

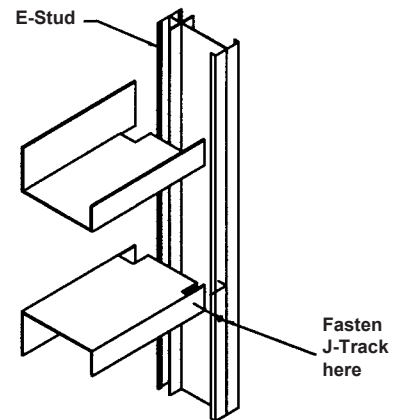


I-Stud



CH-CT-Stud

DETAIL A



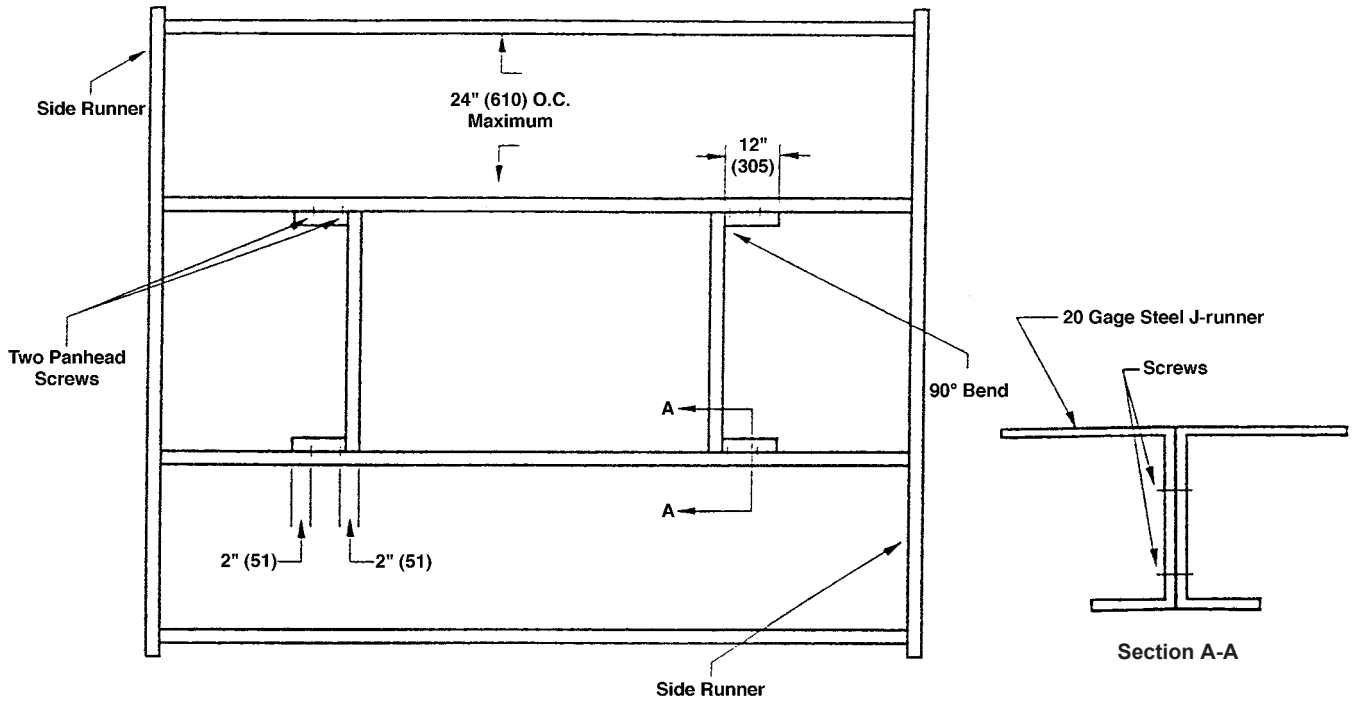
E-Stud

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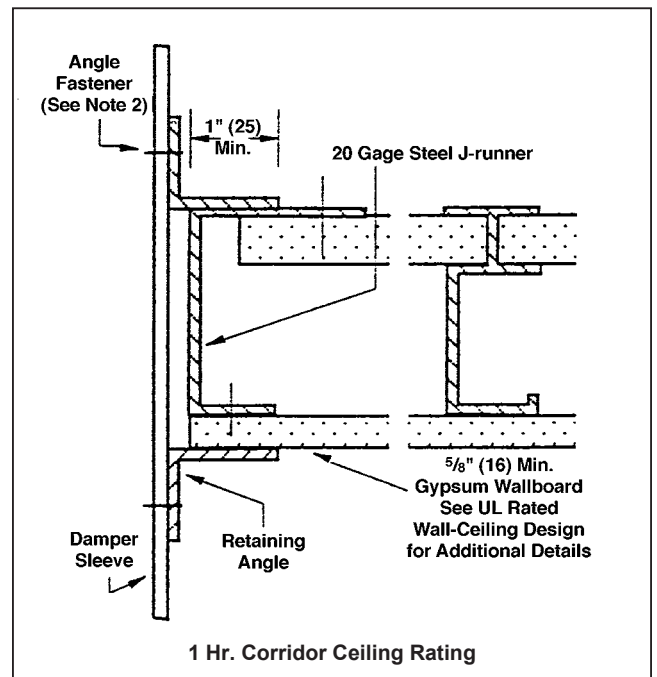
METAL STUD FRAMING FOR COMBINATION FIRE AND SMOKE DAMPERS IN TUNNEL CORRIDOR SHAFT-WALL CEILINGS INSTALLATION INSTRUCTIONS SUPPLEMENT



Opening Preparation Detail - Top View

NOTES

- Gypsum panels must be attached, 12" (305) O.C. maximum, to all stud and runner flanges surrounding opening with 1⁵/₈" (41) drywall screws.
- Mounting angles shall be Ruskin PFMA or a minimum of 1¹/₂" x 1¹/₂" 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).
- See standard installation instructions sheet for additional details.



SEE COMPLETE MARKING
ON PRODUCT

SUPPORT MULLIONS FOR DAMPERS IN OVERSIZED WALL OPENINGS INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATION

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

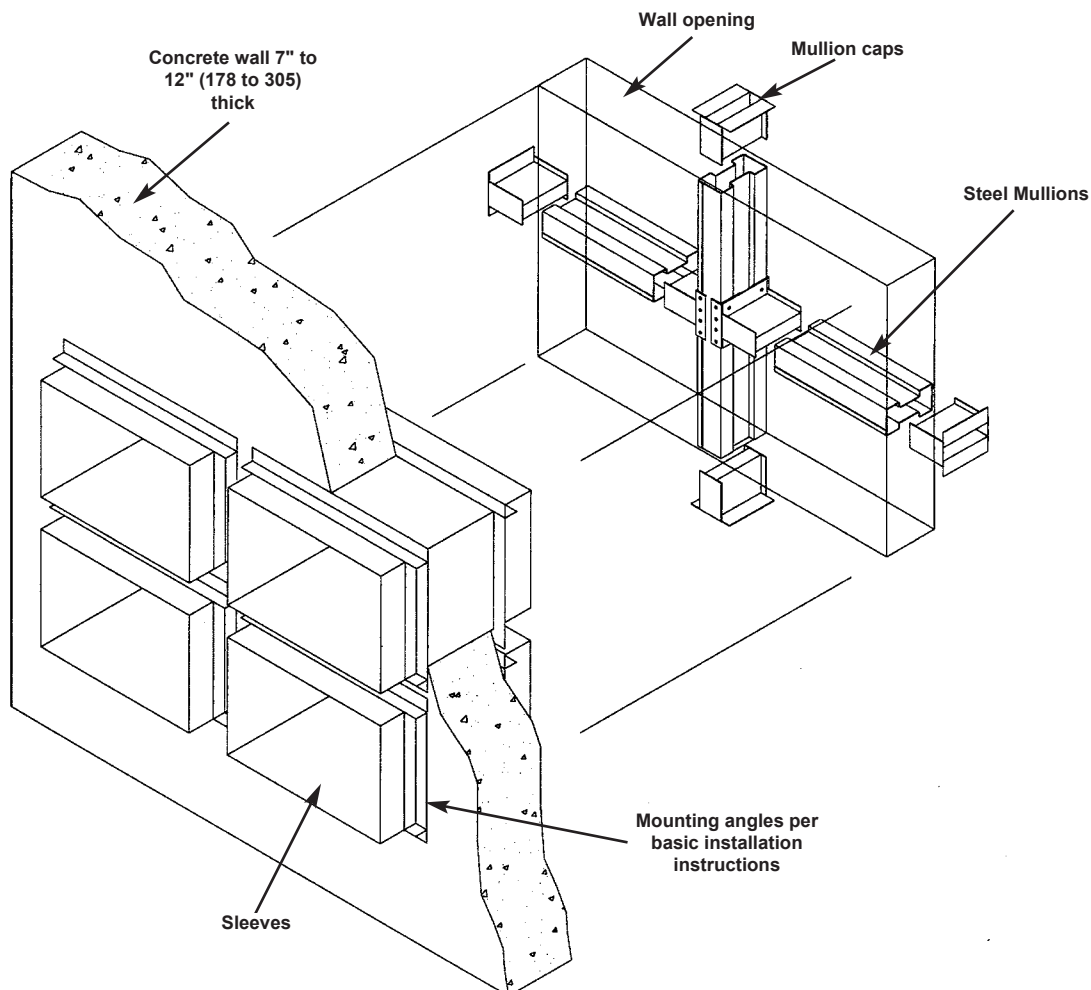
resistance rating of the barrier must be less than 3 hours. Steel support mullions are not intended to be part of the ductwork or in the airstream.

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.



SEE COMPLETE MARKING
ON PRODUCT



GENERAL INSTALLATION

Fabricate mullion of 16 gauge (1.6) galvanized steel as shown in Figure 1. Two mullion pieces are joined with $\frac{3}{16}$ " (5) diameter steel pop rivets or $\frac{3}{4}$ " (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 $\frac{1}{8}$ " (3) per foot or wall opening height. Maximum permitted clearance is $1\frac{1}{4}$ " (31) (for example, permitted clearance for an 8" (203) high opening is $\frac{1}{8}$ " (3) x 8" = 1" (25)).

Fabricate two caps per each mullion of 12 gauge (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 $\frac{1}{8}$ " (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 $\frac{1}{4}$ " (6) - 20 x $\frac{5}{16}$ " (8) steel screws and $\frac{3}{8}$ " (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.

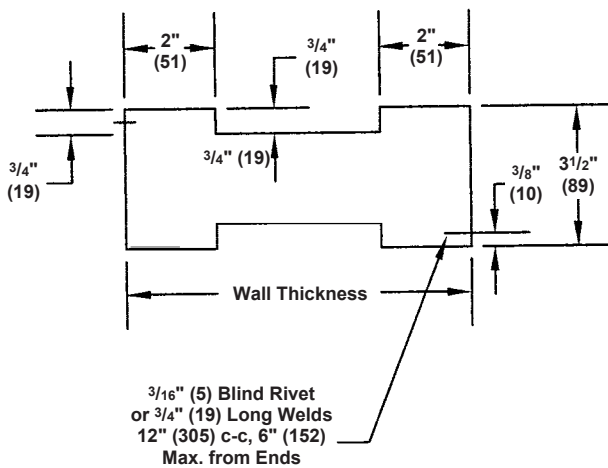
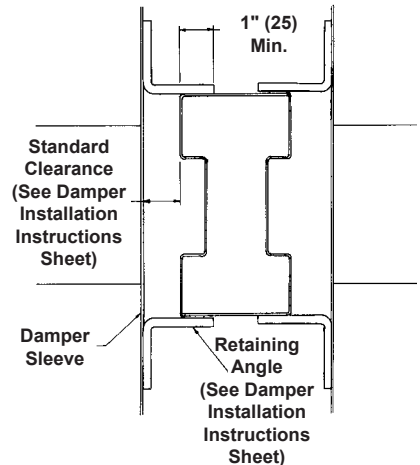


FIGURE 1
Mullion Cross Section 16 ga Galvanized Steel

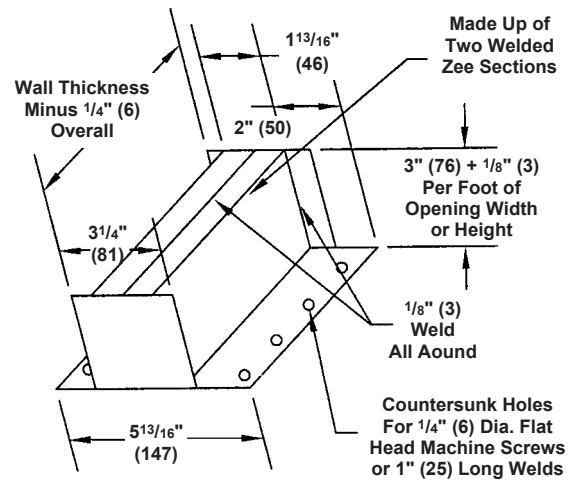


FIGURE 2
Mullion Cap

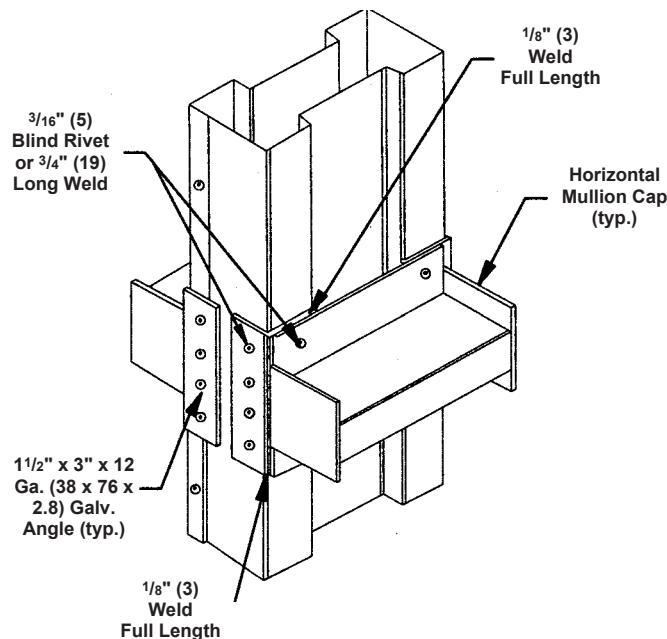


FIGURE 3

NOTE: Dimensions shown in parentheses () indicate millimeters.

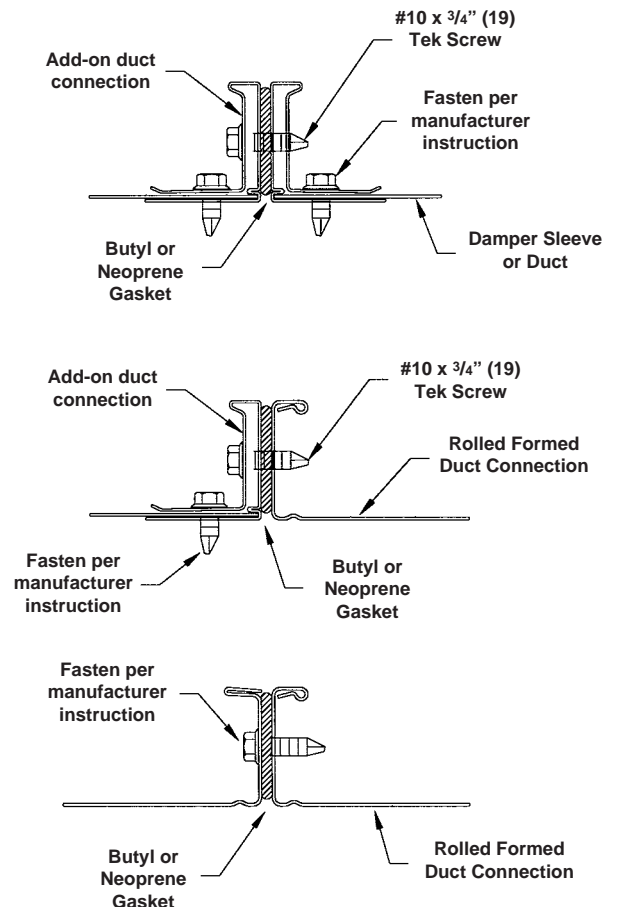
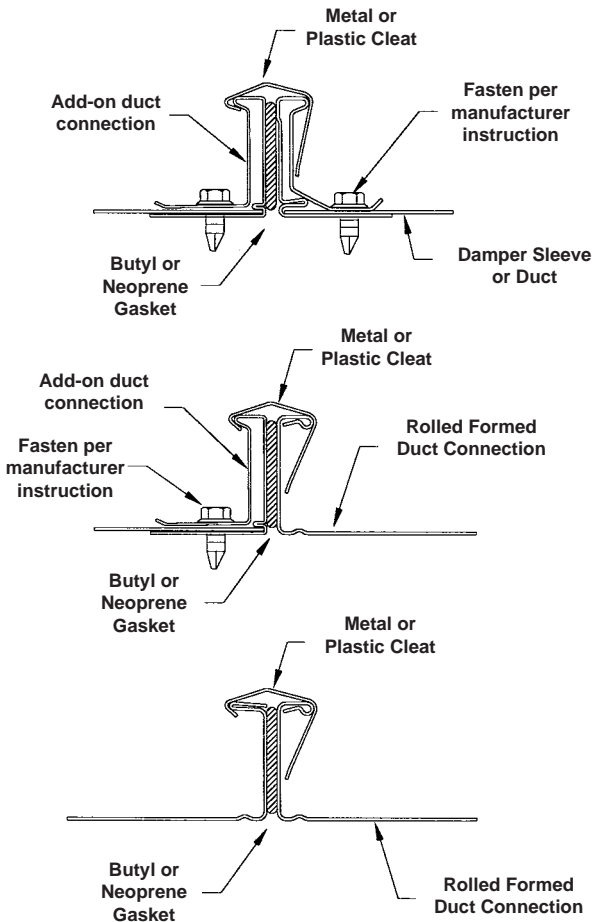
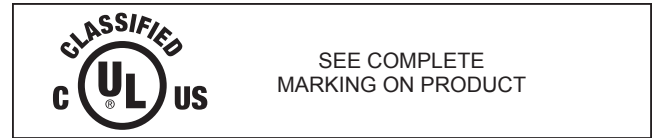
FLANGED SYSTEM BREAKAWAY CONNECTIONS INSTALLATION INSTRUCTIONS SUPPLEMENT

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, MEZ, 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:

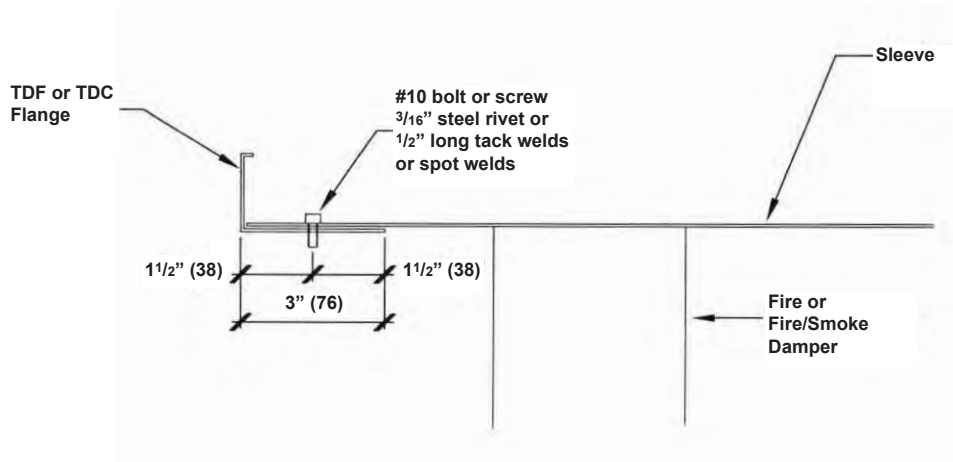
- Width or height less than 24 in. (610mm); use one cleat or screw per side
- Width or height 24 in. (610 mm) to less than 36 in. (914mm); use 2 cleats or screws per side
- Width or height 36 in. (914mm) to less than 54 in. (1372mm); use 3 cleats or screws per side
- Width or height 54 in. (1372mm) to 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.



TDF AND TDC FIELD ADD-ON CONNECTIONS INSTALLATION INSTRUCTIONS SUPPLEMENT

GENERAL INSTALLATION

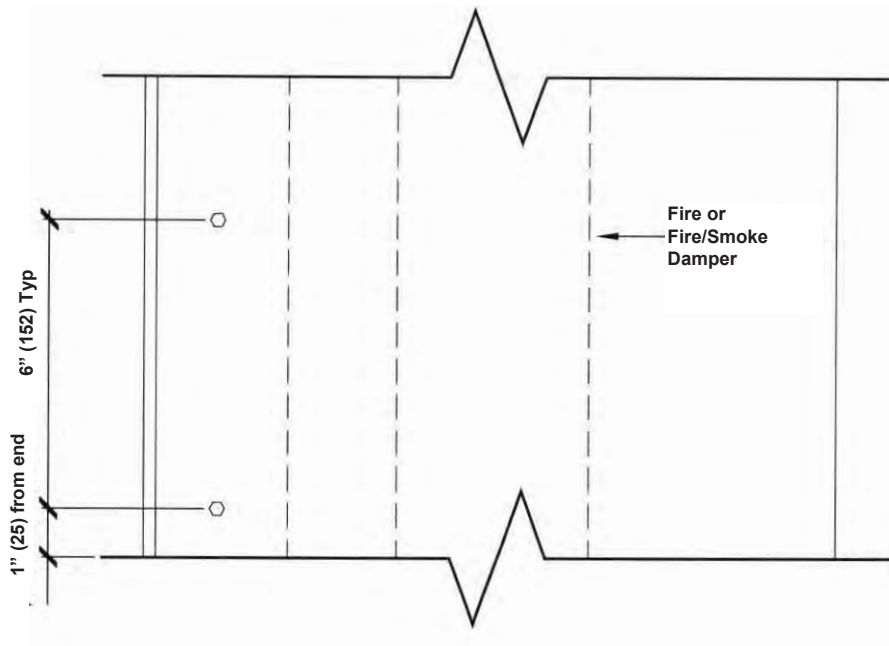
TDF and TDC flanged connections are designed to be roll-formed into the end of the duct or damper sleeve at the time of damper manufacture. If that is not possible, TDF and TDC can be added in the field in accordance with the installation diagram and notes shown below.



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

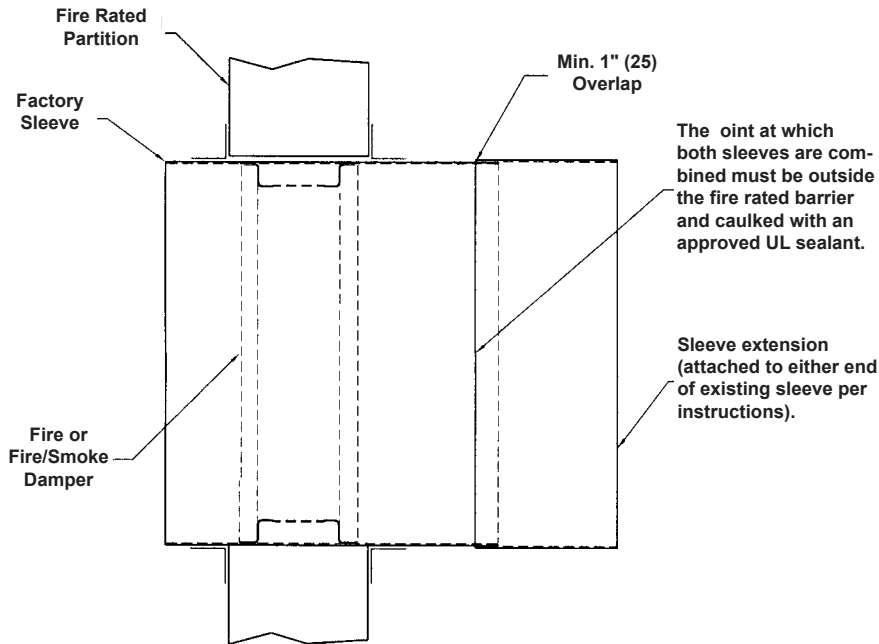


SEE COMPLETE MARKING
ON PRODUCT

NOTE: Dimensions in () indicate millimeters.

EXTENSION OF FIRE AND COMBINATION FIRE AND SMOKE DAMPER SLEEVES INSTALLATION INSTRUCTIONS SUPPLEMENT

FIGURE 1



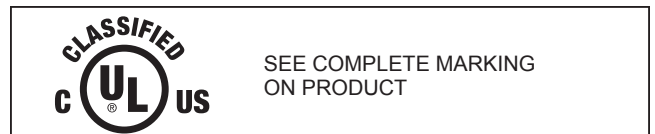
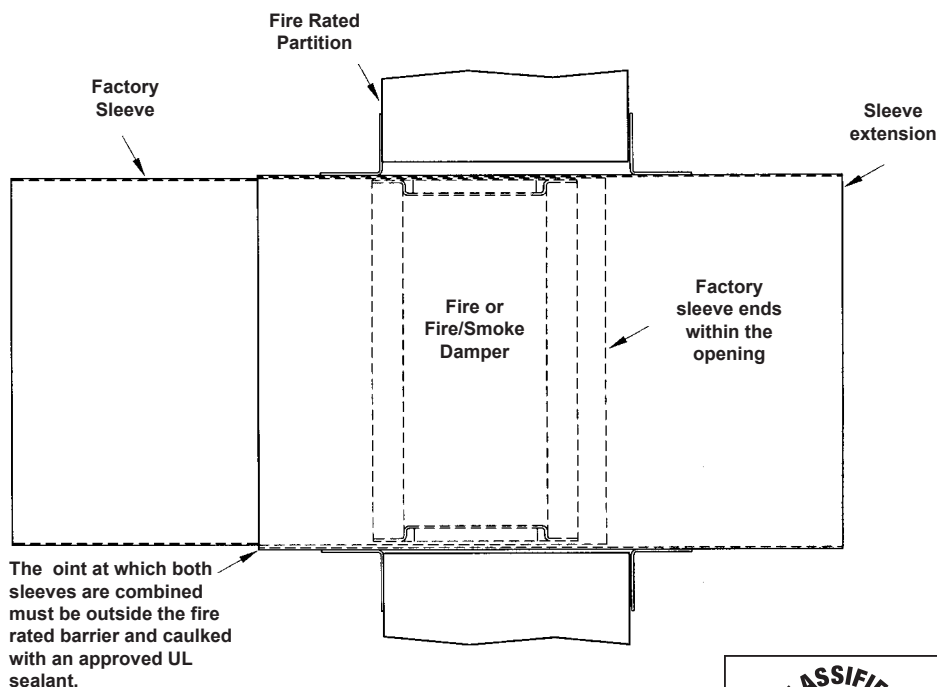
APPLICATION

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

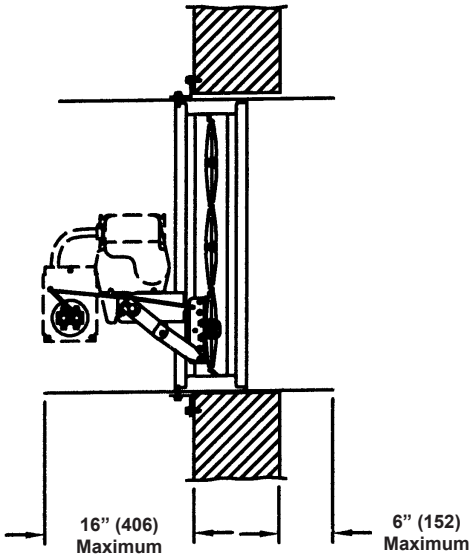
Sleeve extension must be of the same material and gauge as the factory sleeve. Overlap the factory sleeve a minimum of 1" (25). Attach the sleeve extension using No. 10 (M5) bolts or screws, 3/16" (5) rivets, tack welds or spot welds spaced 6" (152) on center. The joint between the two sleeves must then 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.

FIGURE 2



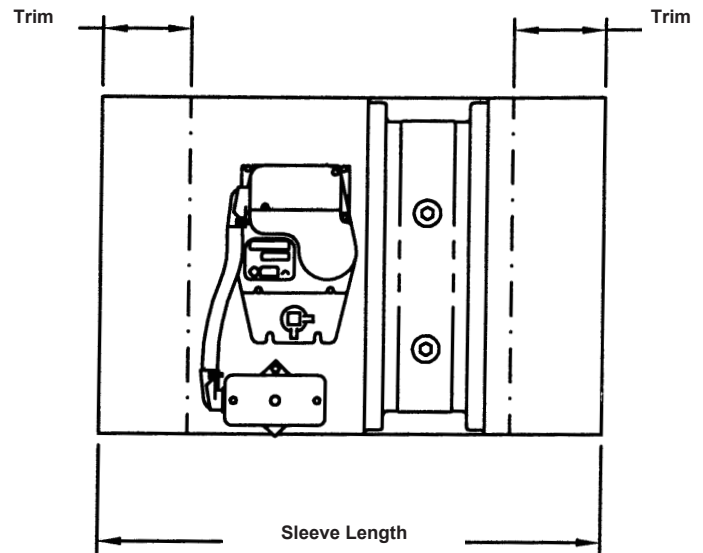
TRIMMING OF FIRE AND COMBINATION FIRE SMOKE DAMPER SLEEVES INSTALLATION INSTRUCTIONS SUPPLEMENT

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.

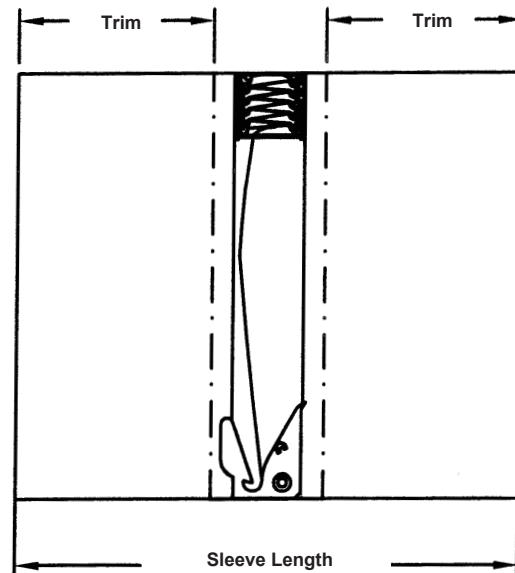


Sleeve Dimensions

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.



COMBINATION FIRE SMOKE DAMPER



FIRE DAMPER

INSTALLATION INSTRUCTION SUPPLEMENT
1½ HOUR UL CLASSIFIED
CURTAIN TYPE (D)IBD SERIES, MULTI-BLADED DFD AND FSD SERIES
VERTICAL MOUNT DAMPERS WITH 3-SIDE RETAINING ANGLE

Refer to Ruskin Installation Instructions for (D)IBD-xxx, DFD-xxx and FSD-xxx series Fire & Combination Fire/Smoke dampers for additional information

APPLICATION

This instruction applies to 1½ hour rated combination fire/smoke dampers and fire dampers mounted in masonry, block, metal stud, or wood stud walls. Specific requirements in these instructions are mandatory. These instructions meet UL555 requirements. Installation shall meet requirements of NFPA 90A (standard for the Installation of Air Condition and Ventilating Systems) and UL Classification R5531.

1. Mounting Angles

Mounting angles shall be a minimum of 1½" x 1½" x 20 gauge steel (38 x 38 x 1.0). For openings in metal stud, wood stud, or concrete/masonry walls of sizes 90" x 49" (2286 x 1245) or 49" x 90" (1245 x 2286) and less mounting angles are only required on one side of the wall 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 installations only. Mounting angles must overlap the partition a minimum of 1" (25). Do not weld or fasten angles together at corners of dampers.

a. Mounting Angle Fasteners

Sleeve: #10 bolts or screws, 3/16" (5) steel rivets or 1/2" (13) long welds. Masonry/Wall: #10 self-tapping concrete screws. Wood/Steel Stud Wall: #10 screws.

b. Mounting Angle Fastener Spacing

Fasteners attaching to sleeve are to be spaced at 6" (152) o.c. and fasteners fastening to wall shall be spaced at 12" (305) o.c. with a minimum of 2 fasteners on each side. 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 must engage the wall a minimum of 1½" (38).

2. Firestop Material Option (See Installation Supplement for addition information)

- a. Packing (Optional) - Polyethylene backer rod, recessed from both surfaces of wall to accommodate the required thickness of fill material.
- b. Fill Material - Fire stop caulk applied to a minimum 5/8" (16) thickness for 1½ hour dampers or 1" (25) for 3 hour dampers within the annular space and flush with both surfaces of the wall. If the damper/sleeve assembly comes into contact with the wall, a minimum 3/8" (10) diameter bead shall be applied to the interface between the sleeve and contact surface.

Hilti Corporation • FS-One, CP606

3M • #M-CP 25WB+

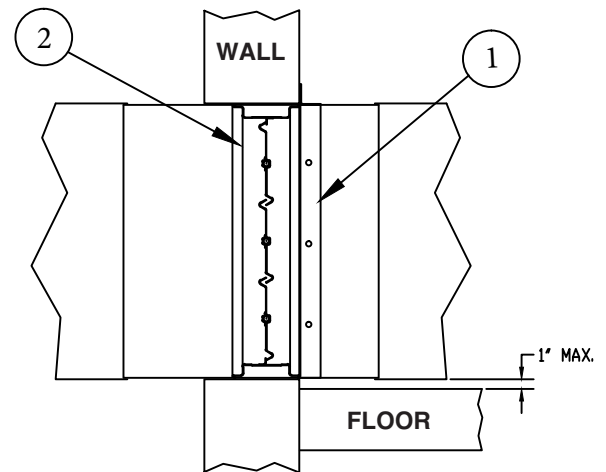
Specified Technologies, Inc. • SpecSeal® Series SSS or LCI
John Manville International, Inc. - Firetemp™ CI

Rectorseal • Metacaulk 1000, Metacaulk 350i, Biostop 500+ or Biostop 350i

3. Opening Clearance

For 3-side 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 as long as the annular space is not greater than 1".

- a. For installations requiring angles on (top and both sides), the damper shall rest directly on the base of the wall opening. The sleeve on the retaining angle side of the installation shall not be more than 1" above the floor.
- b. For applications requiring angles on (top, bottom & one side) or (both sides and bottom), firestop material shall be used on remaining side between sleeve and opening in wall. See Ruskin's Optional Firestop Material installation supplement for complete installation requirements.



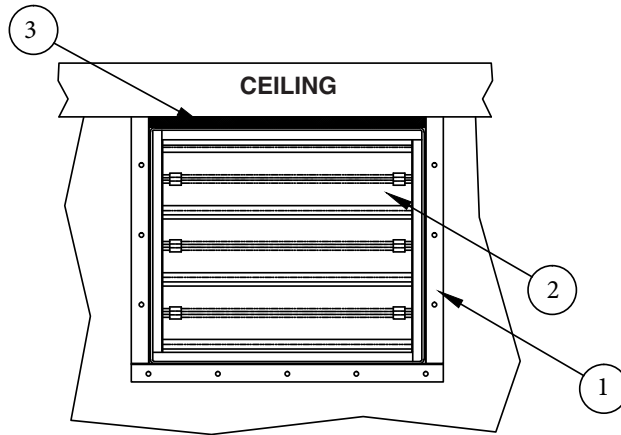
TYPICAL SECTION

1. MOUNTING ANGLES

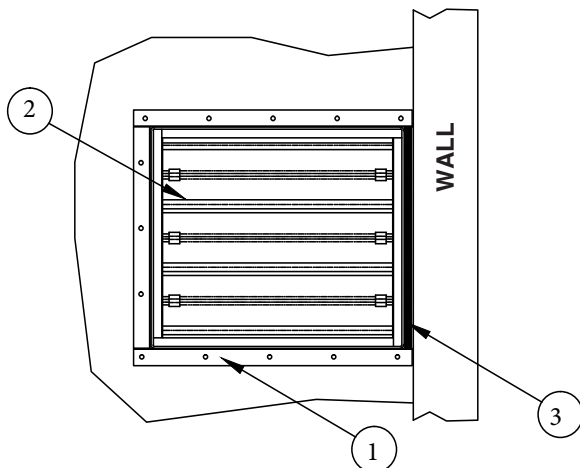
2. DAMPER ASSEMBLY



SEE COMPLETE MARKING
ON PRODUCT

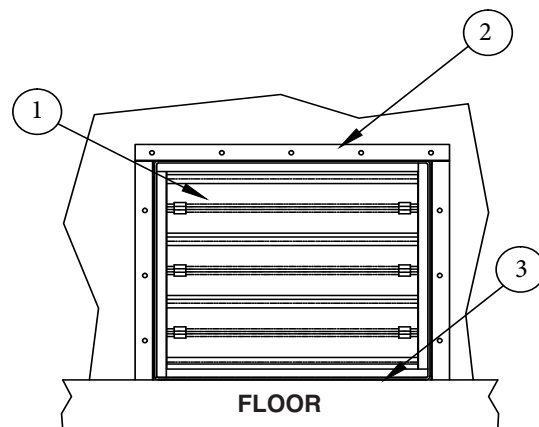


ANGLES BOTTOM AND BOTH SIDES



ANGLES TOP, BOTTOM AND ONE SIDE

- 1. MOUNTING ANGLES
- 2. DAMPER ASSEMBLY
- 3. FIRESTOP MATERIAL



ANGLES TOP AND BOTH SIDES

RUSKIN[®]

3900 Dr. Greaves Rd.
 Kansas City, MO 64030
 (816) 761-7476
 FAX (816) 765-8955
 www.ruskin.com

OPTIONAL FIRESTOP MATERIAL INSTALLATION INSTRUCTIONS SUPPLEMENT

APPLICATION

Application of firestopping caulk in the annular space surrounding a 1½ 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 2½" thick normal weight (100 - 150 pcf) or minimum 4½" 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 3½" (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 gauge (1.0) 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 1½" (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 1½ 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.

Hilti Corporation - FS-One, CP606

3M - #M-CP 25WB+

Specified Technologies, Inc. - SpecSeal® Series SSS or LCI

John Manville International, Inc. - Firetemp™ CI

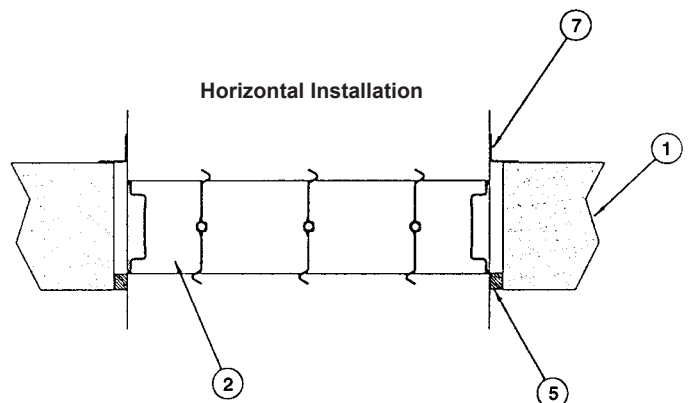
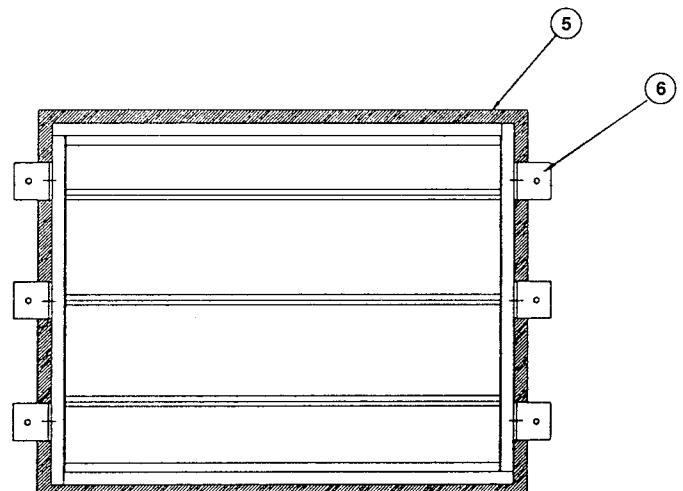
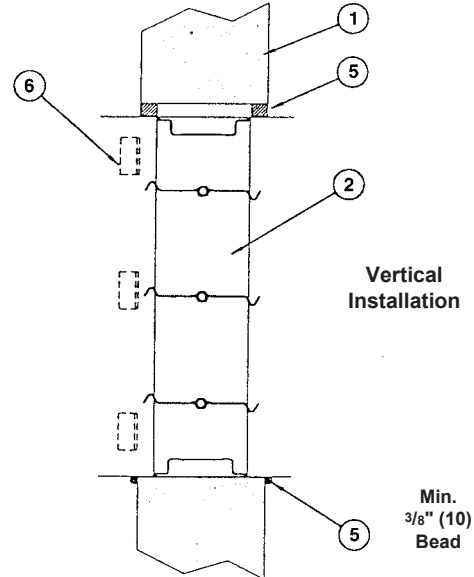
Rectorseal - Metacaulk 1000, Metacaulk 350i, Biostop 500+ or Biostop 350i

6. Retaining Clip – (Walls Only),

1" x 2" x 2" x 16 gauge (25 x 51 x 51 x 1.6) angle attached to one side of the wall with 1½" (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 1½ x 1½ x 16 gauge (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

OPTIONAL SEALANT OF DAMPERS IN FIRE RATED WALL OR FLOOR OPENINGS INSTALLATION INSTRUCTIONS SUPPLEMENT

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.

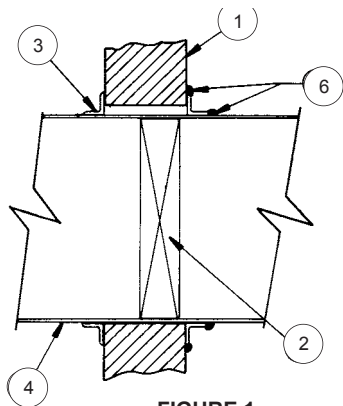


FIGURE 1

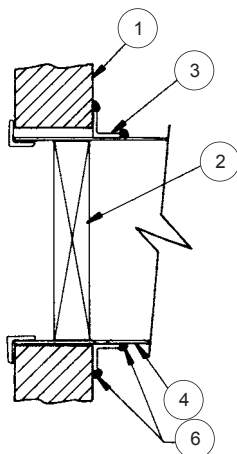


FIGURE 3

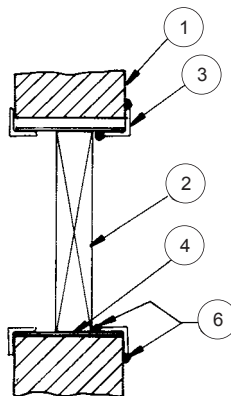


FIGURE 2

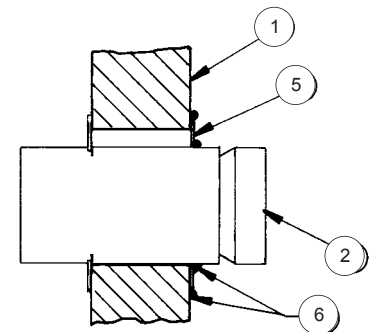


FIGURE 4

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)



SEE COMPLETE MARKING
ON PRODUCT

TRANSFER OPENINGS AND GRILLE DUCT TERMINATIONS INSTALLATION INSTRUCTIONS SUPPLEMENT

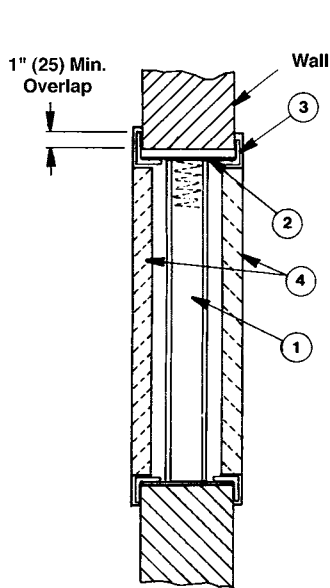


FIGURE 1
TRANSFER OPENING
CURTAIN TYPE FIRE DAMPER

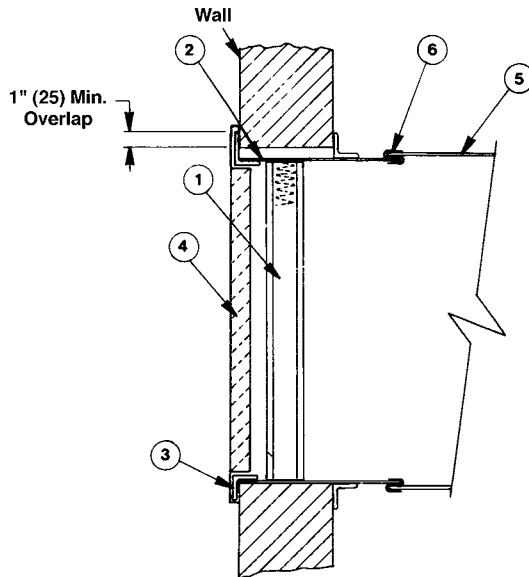


FIGURE 2
GRILLE DUCT TERMINATION
CURTAIN TYPE FIRE DAMPER

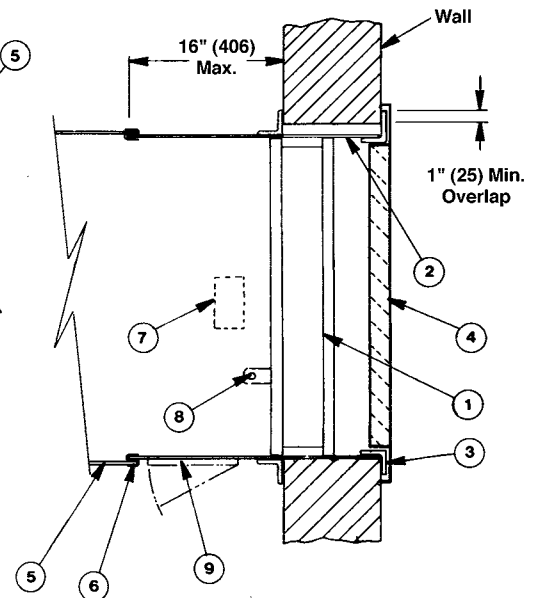


FIGURE 3
GRILLE DUCT TERMINATION
MULTIPLE BLADE FIRE DAMPER OR
COMBINATION FIRE AND SMOKE DAMPER

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 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.

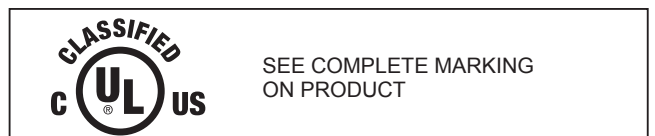
ITEM

DESCRIPTION

- | | |
|----|--|
| 1. | Curtain type or multiple blade fire damper |
| 2. | Damper sleeve |
| 3. | Mounting angle (see note 4 below) |
| 4. | Grille (optional – supplied by others) |
| 5. | Duct |
| 6. | Duct to damper sleeve connection |
| 7. | Actuator (location varies) |
| 8. | Jackshaft (indicates damper positioning) |
| 9. | Access door (optional) |

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 gauge (.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

Vertical Installation

DIBD2 - 32" w x 36" h (813 x 914)
DIBD20 - 32" w x 36" h (813 x 914)

Horizontal Installation

DIBD2 - 24" w x 18" h (610 x 457) or
18" w x 24" h (457 x 610).
DIBD20 - 24" w x 18" h (610 x 457) or
18" w x 24" h (457 x 610).

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" x 48" (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.



California State Fire Marshal Listing No. 3225-245:005
California State Fire Marshal Listing No. 3225-245:102

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) ($3/16"$ 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

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 gauge 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 by 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 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

Damper 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 gauge 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 $3/4" \times 3/4" \times 3"$ long 20 gauge (19 x 19 x 76 x 1.0) galvanized steel. They must be attached to the damper sleeve with a minimum of two $3/16"$ (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 $1 1/2" \times 1 1/2" \times 20$ gauge 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, $1/2"$ (13) long tack welds or $3/16"$ (3) diameter steel rivets.

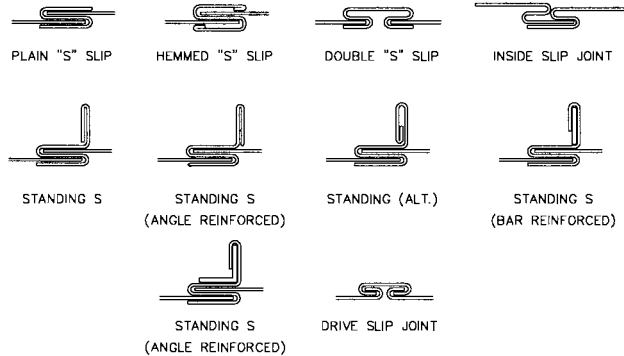
b. Mounting Angle Fastener Spacing

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:



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 – PA2084T
Eco Duct Seal 44-52 Design Polymeric – 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.

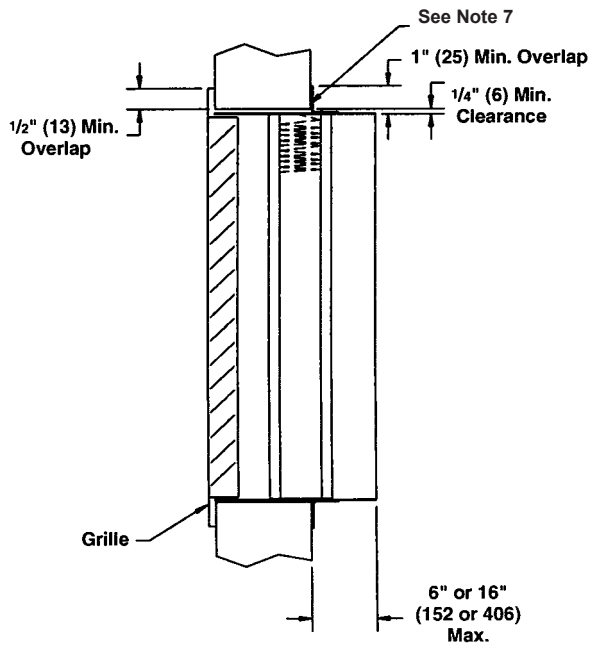
d. Non-Break-away Duct/Sleeve Connections

If other duct sleeve connections are used, the sleeve shall be a minimum of 16 gauge (1.6) for dampers up to 36" (914) wide x 24" (610) high and 14 gauge (2.0) for dampers exceeding 36" (914) wide x 24" (610) high.

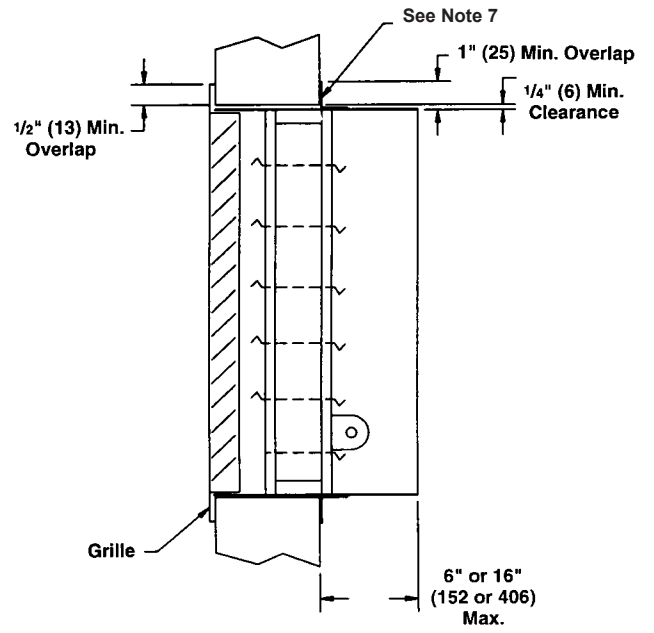
9. Installation and Maintenance

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**

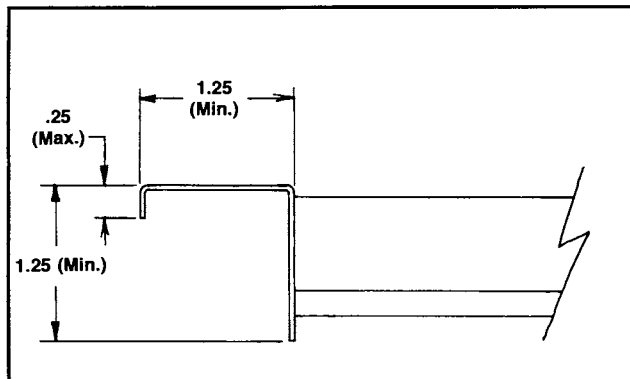


**COMBINATION FIRE AND SMOKE DAMPER
VERTICAL INSTALLATION**

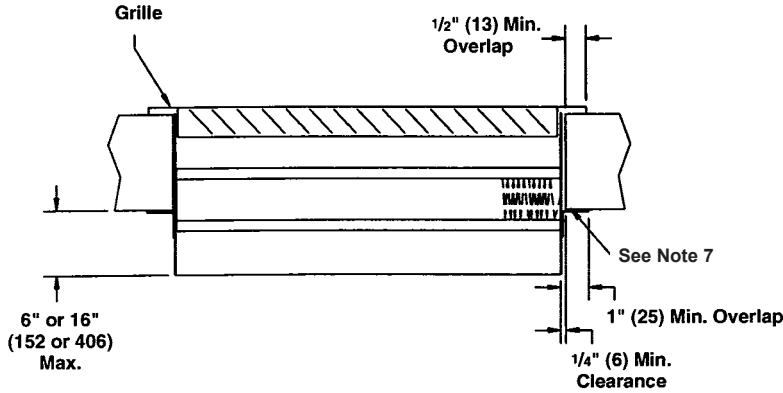


GRILLE DETAIL

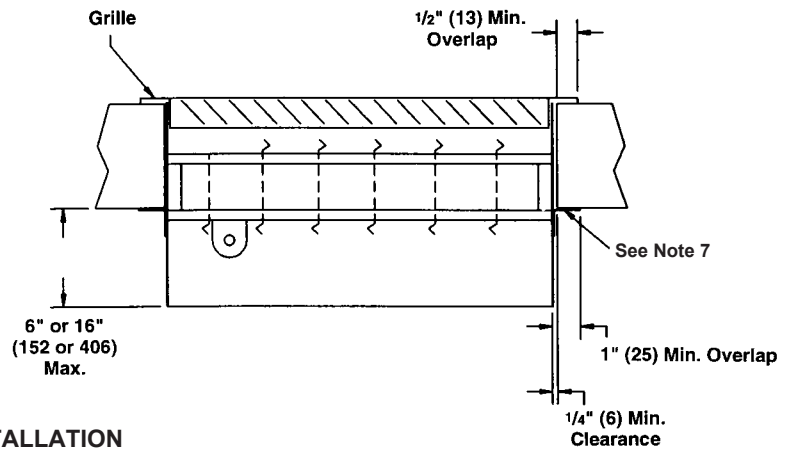
Grille must be minimum 26 ga. steel.



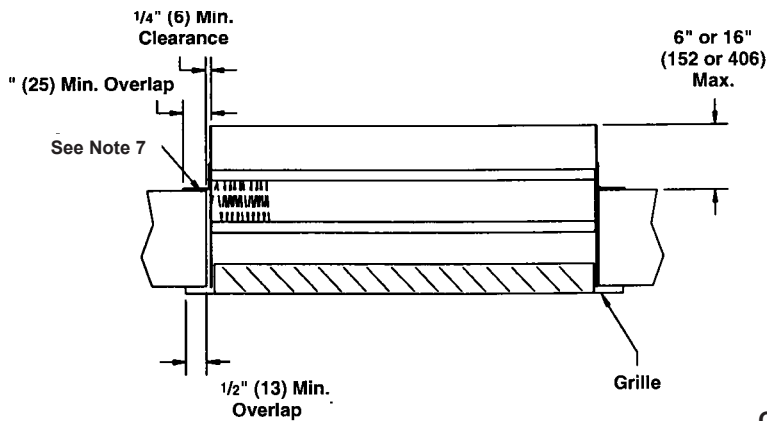
CURTAIN TYPE FIRE DAMPER HORIZONTAL INSTALLATION



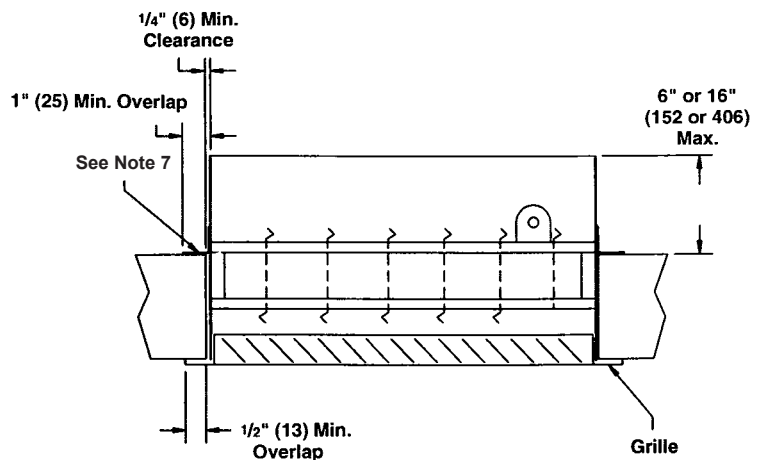
COMBINATION FIRE AND SMOKE DAMPER HORIZONTAL INSTALLATION



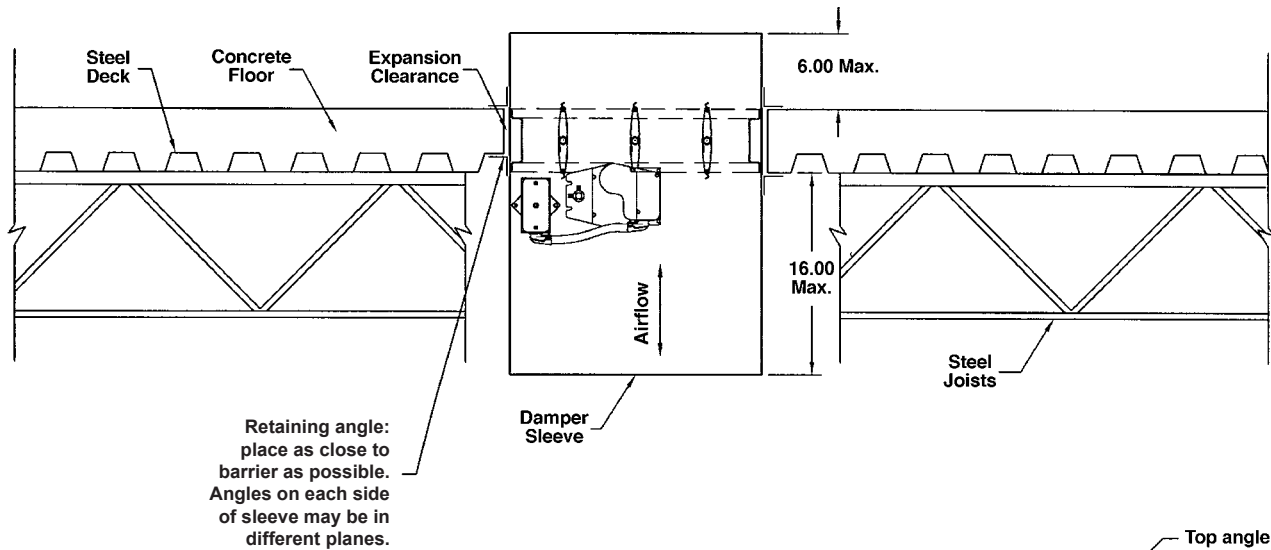
CURTAIN TYPE FIRE DAMPER HORIZONTAL INSTALLATION



COMBINATION FIRE AND SMOKE DAMPER HORIZONTAL INSTALLATION



FIRE AND COMBINATION FIRE AND SMOKE DAMPER INSTALLATION IN CONCRETE FLOOR WITH STEEL DECK INSTALLATION INSTRUCTIONS SUPPLEMENT

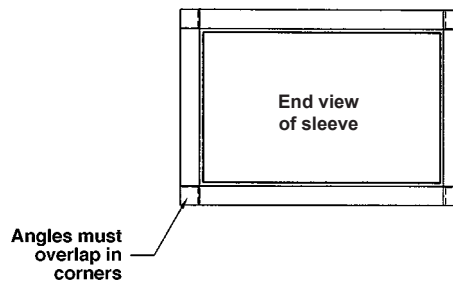
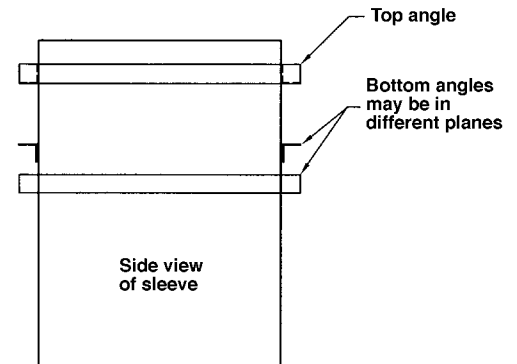


APPLICATION

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."



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

Type of Connection	Duct	Duct Dimension	Sleeve Gauge
Rigid	Round – Rectangular	24 in. (610 mm) maximum diameter 24 in. (610 mm) maximum height and 36 in. (915 mm) maximum width	16 ⁺ (1.613 ⁺ mm)
Rigid	Round – Rectangular	over 24 in. (610 mm) diameter over 24 in. (610 mm) height and over 36 in. (915 mm) width	14 ⁺ (1.994 ⁺ mm)
Breakaway (See Figure 5-2 on pages 5.5 and 5.6)	Round or Rectangular	12 in. (305 mm) and down 13 – 30 in. (330 – 760 mm) 31 – 54 in. (785 – 1370 mm) 55 – 84 in. (1400 – 2130 mm) 85 in. (2160 mm) and up	26 (0.55 mm) 24 (0.70 mm) 22 (0.85 mm) 20 (1.0 mm) 18 (1.3 mm)

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.



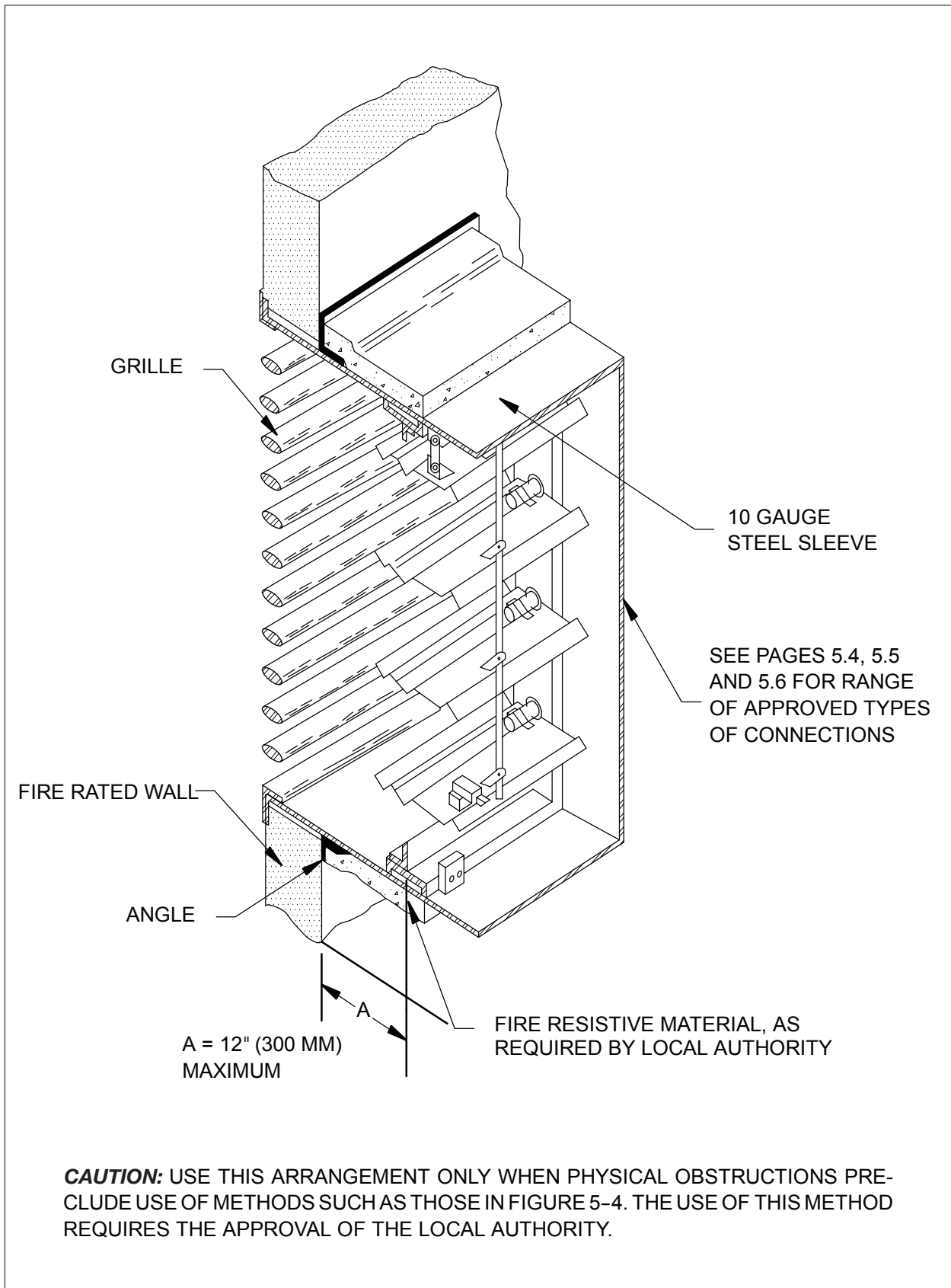


FIGURE 5-5 FIRE DAMPER OUT OF WALL



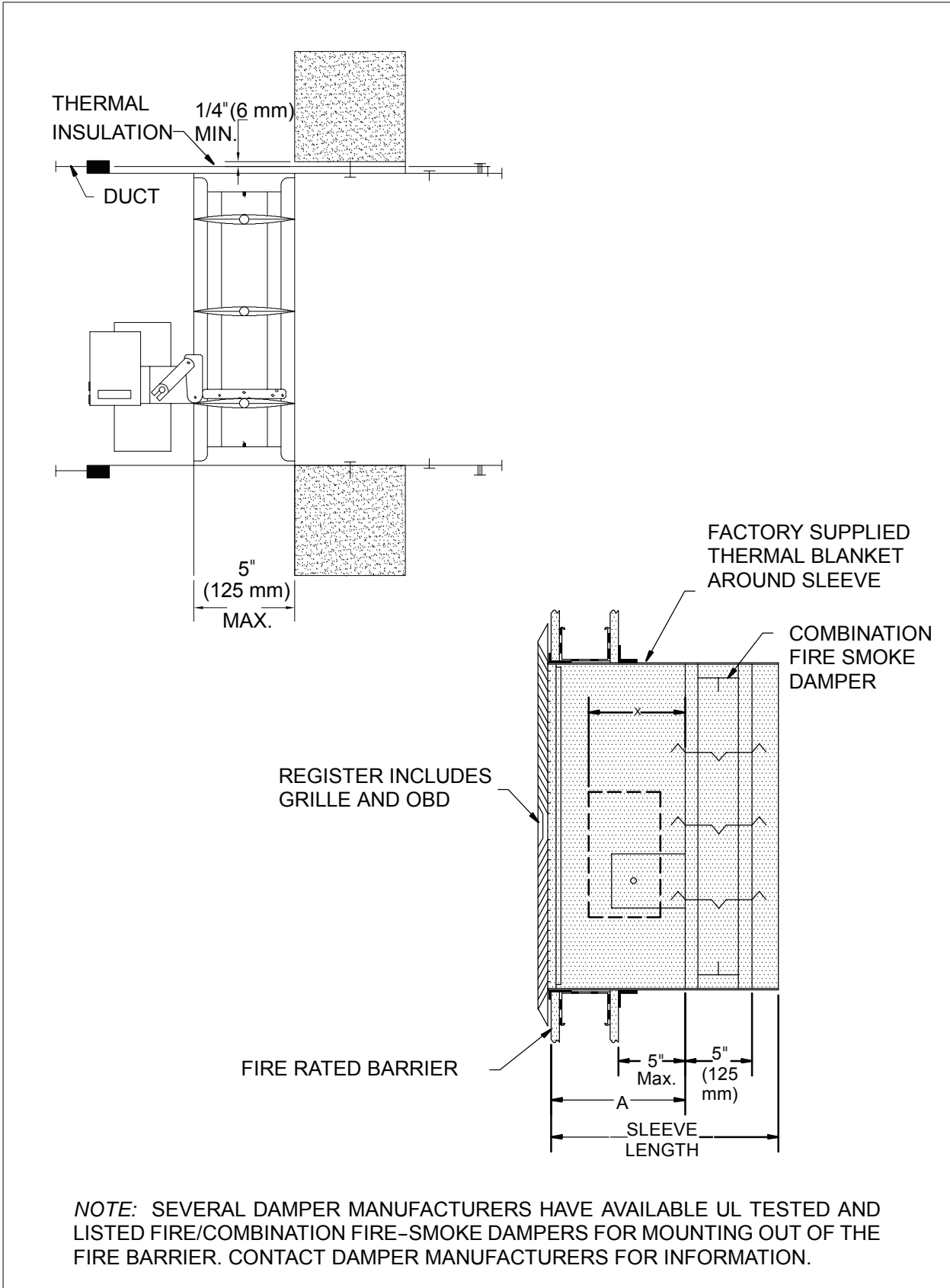
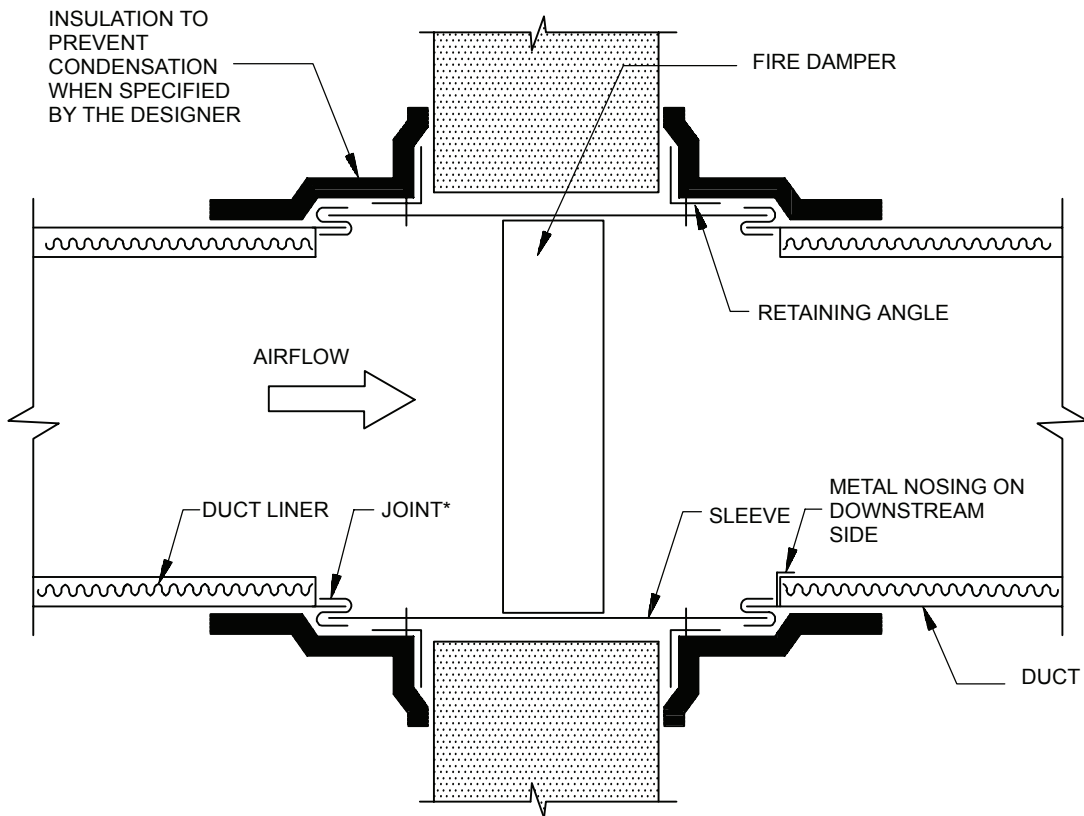


FIGURE 5-6 COMBINATION FIRE/SMOKE DAMPER OUT OF WALL INSTALLATION





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.

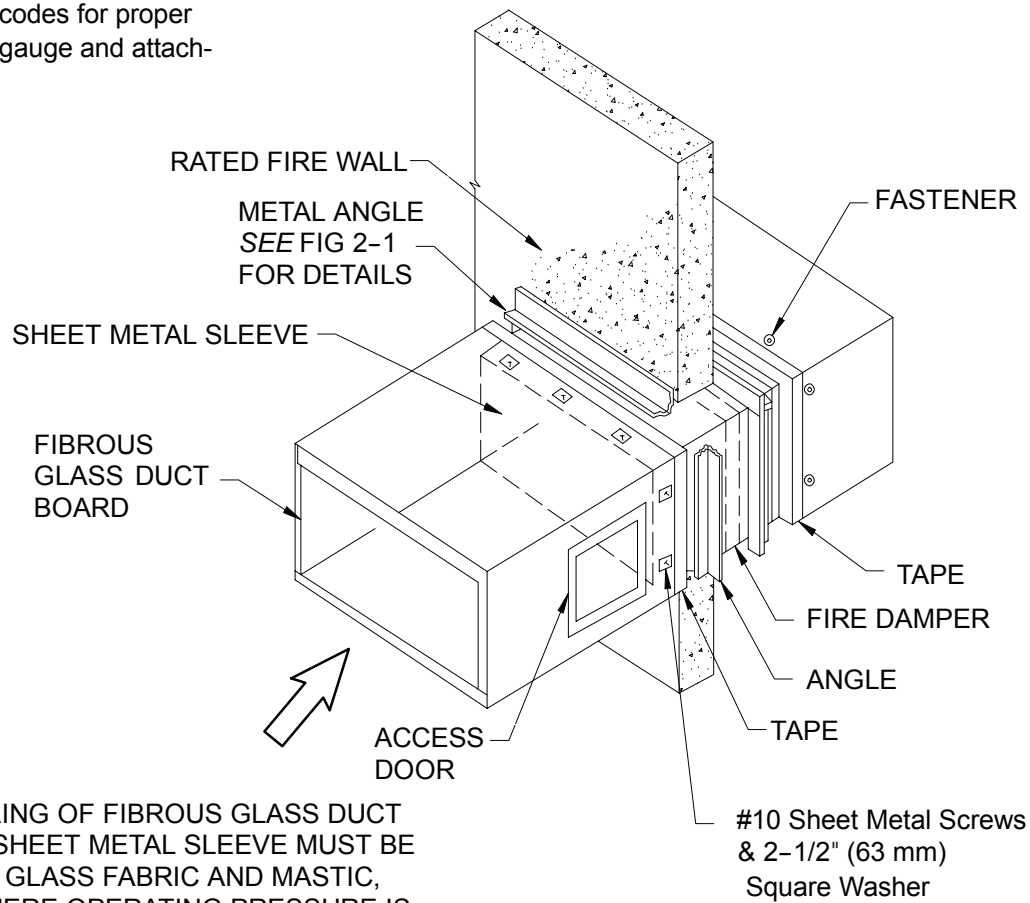
*S SLIP IS ILLUSTRATED; SEE FIGURE 5-2 FOR RANGE OF APPROVED TYPES OF CONNECTIONS.

FIGURE 5-8 DUCT LINER INTERRUPTION



FIRE DAMPER INSTALLATION

Sheet metal sleeve must be installed through rated fire wall. Check local codes for proper sheet metal gauge 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.

#10 Sheet Metal Screws and 2-1/2" (63 mm) Square Washers, 12" (Max.) O.C. to Attach Duct Board to Sheet

Sheet Metal Sleeve Through Fire Wall as Specified in Fire Damper MFR's Instructions

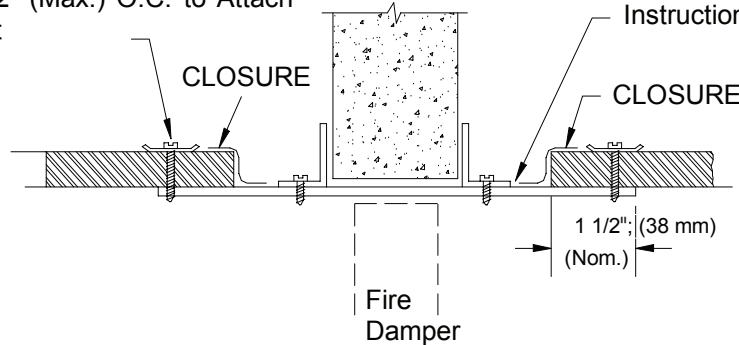
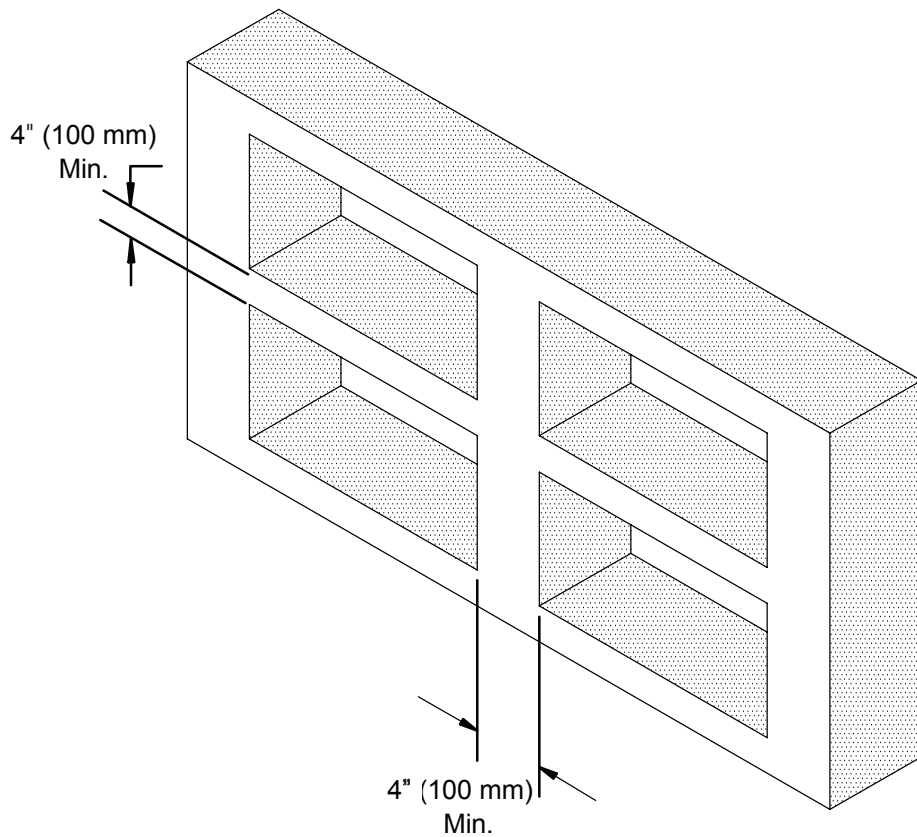


FIGURE 5-9 FIBROUS GLASS DUCT INSTALLATION



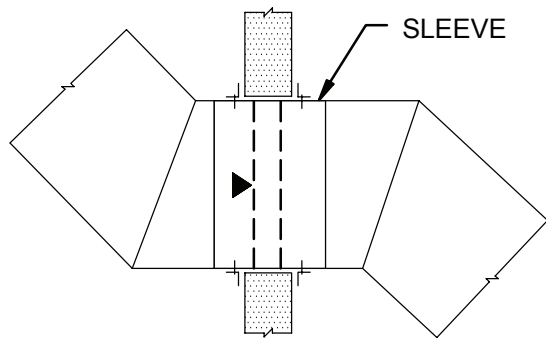


Fire Resistant Barrier with Multiple Openings

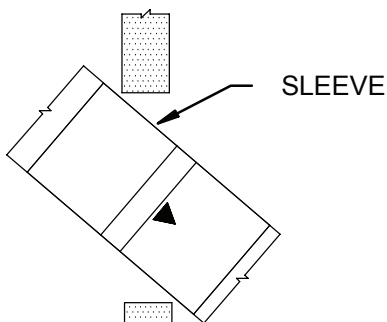
NOTE 1: Structural openings shall be sized to permit expansion of the damper assemblies.

NOTE 2: Separate ducts can go to each opening or they can be unducted openings.

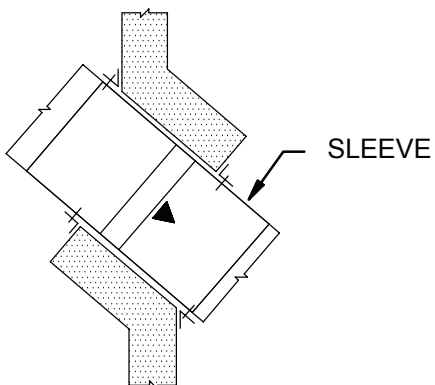
FIGURE 6-3 MULTIPLE PENETRATIONS



CORRECT



INCORRECT



CORRECT
(ALTERNATE METHOD)

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](#)



EFL ELECTRIC RESETTABLE "FUSE" LINK OPERATION INSTRUCTIONS SUPPLEMENT

APPLICATION

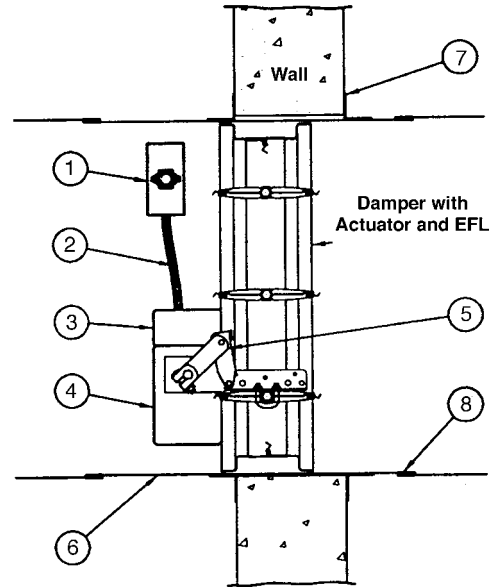
The EFL Electric Resettable "Fuse" Link is a UL Classified heat responsive device is used in conjunction with Ruskin fire/smoke dampers. The EFL is **standard** on all fire/smoke dampers ordered with electric actuators. Fire/smoke dampers ordered with pneumatic actuators may be ordered with the EFL and an EP (electric/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 EFLs 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.



ITEM

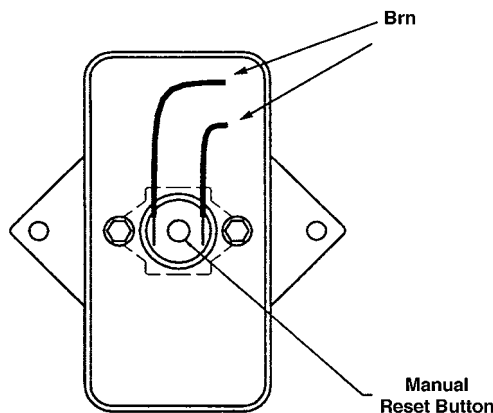
DESCRIPTION

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)

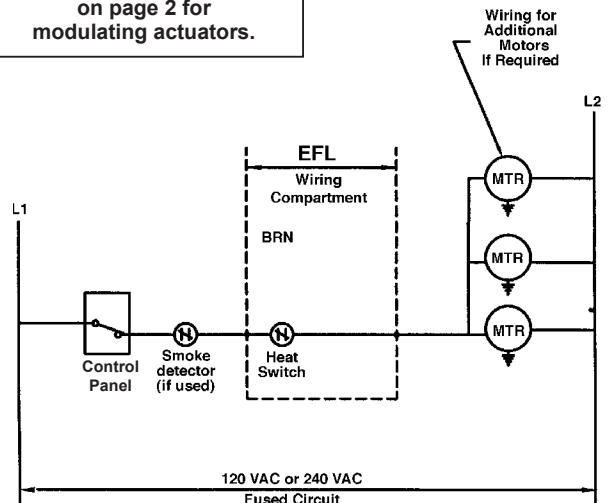


Pneumatic actuators to be piped per local codes.

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



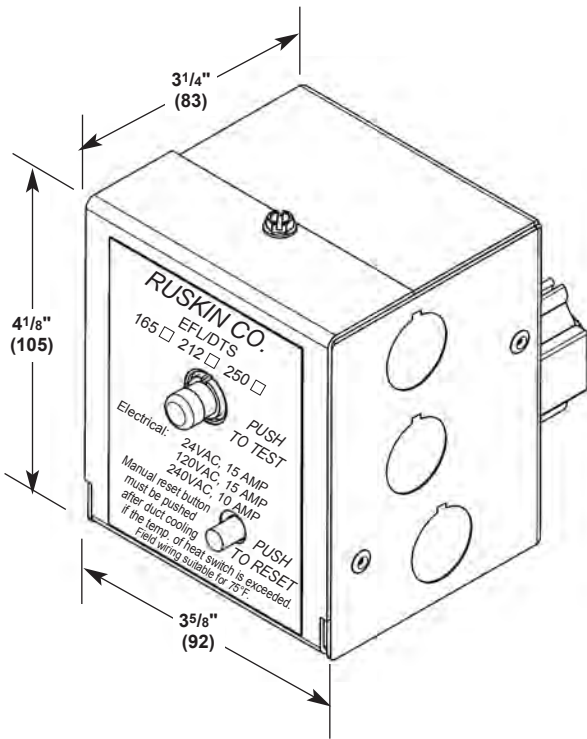
Refer to wiring diagrams on page 2 for modulating actuators.



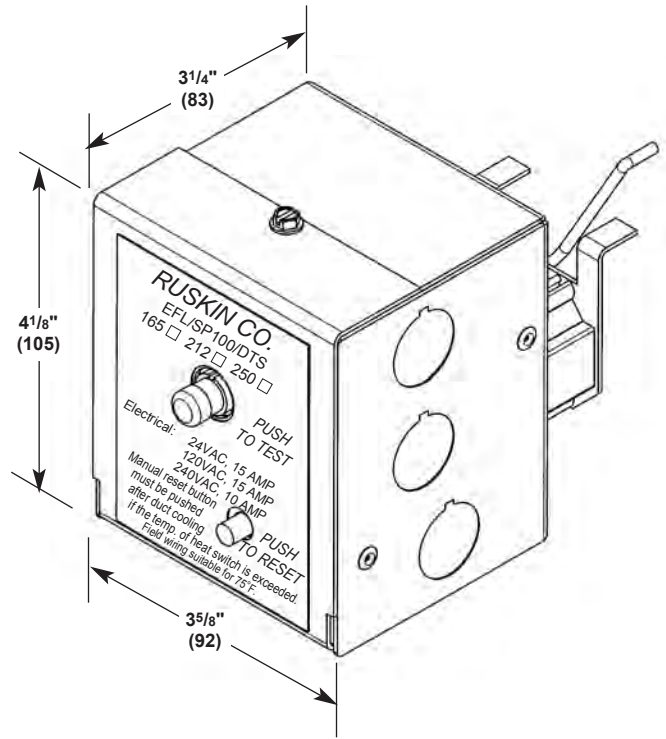
DTS – DAMPER TEST SWITCH OPERATION INSTRUCTION SUPPLEMENT

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.

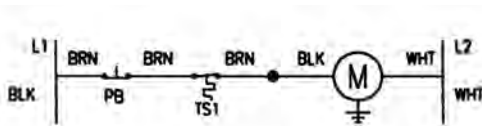


DTS/EFL

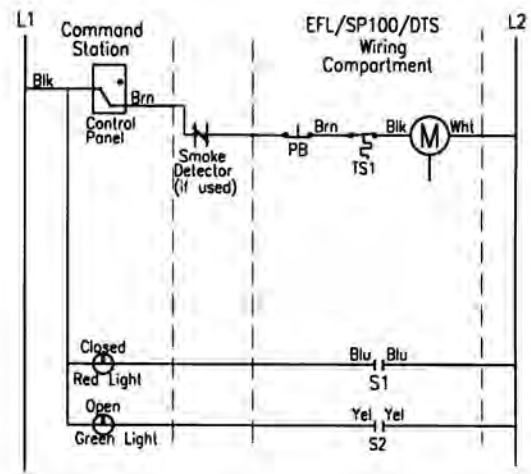


DTS/EFL/SP100

WIRING DIAGRAMS



DTS/EFL



DTS/EFL/SP100



NOTE: Dimensions shown in parentheses () indicate millimeters.

EFL/SP100 ELECTRIC RESETTABLE "FUSE" LINK AND SWITCH PACKAGE OPERATION INSTRUCTIONS SUPPLEMENT

APPLICATION

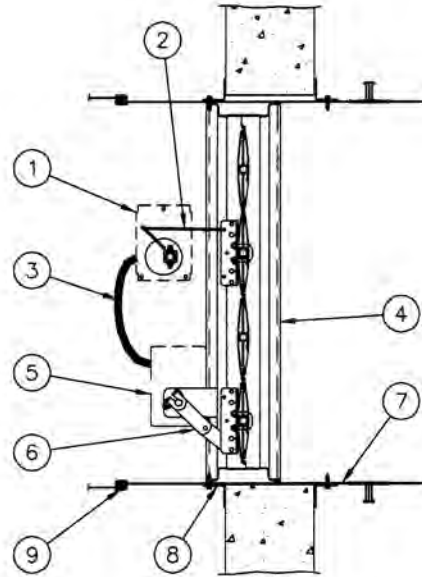
The EFL/SP100 is a UL Classified heat responsive device and position indicator switches (combined as a single unit) used in conjunction with Ruskin fire/smoke dampers. The EFL is **standard** on all fire/smoke dampers ordered with electric actuators. The EFL/SP100 will be provided when an electric actuator 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.



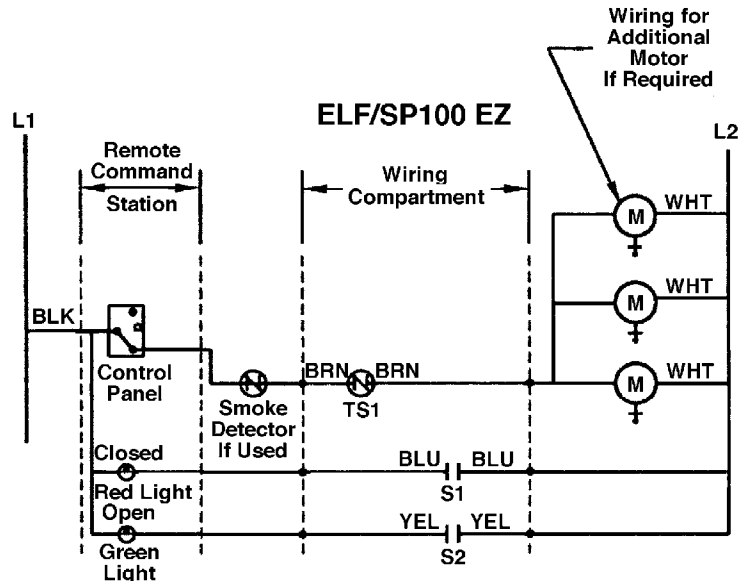
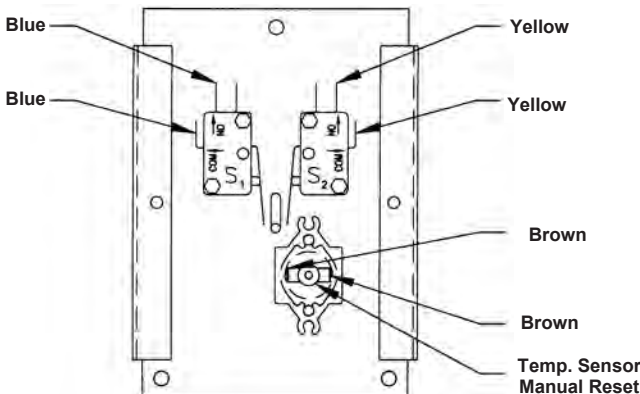
ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	EFL/SP100 System	6.	Over-Center Lock
2.	Adjustable Connecting Rod	7.	Damper Sleeve
3.	Flex Conduit	8.	PFMA or conventional mounting angles
4.	Damper Frame	9.	Sleeve to Duct Connection (by others)
5.	Actuator or EP Switch		



SEE COMPLETE MARKING ON PRODUCT

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



M – Electric Actuator or EP Switch
TS1 – Temp. Sensor
S1 – Position Indicator Switch (Closed)
S2 – Position Indicator Switch (Open)

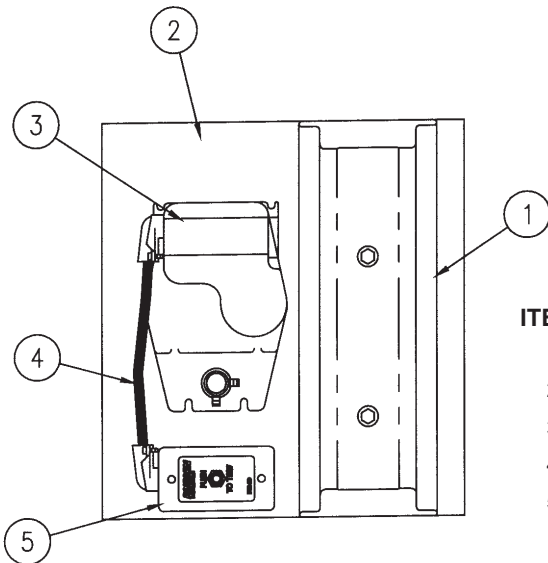
DTS-SD DAMPER TEST SWITCH FOR SMOKE DAMPERS OPERATION INSTRUCTION SUPPLEMENT

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.

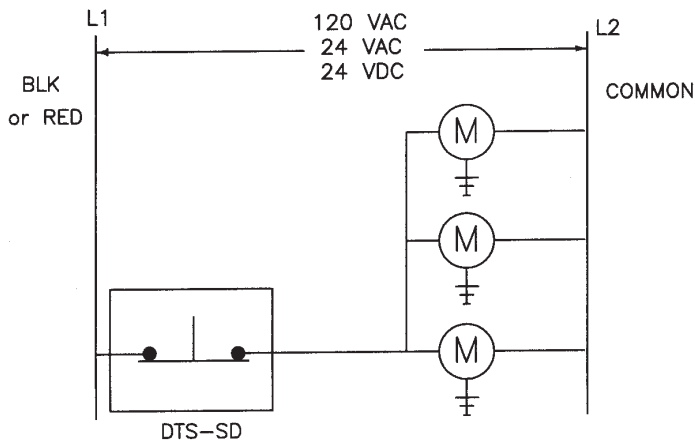


SEE COMPLETE
MARKING ON PRODUCT



ITEM	DESCRIPTION
1.	Smoke Damper
2.	Side Plate or Sleeve
3.	Actuator
4.	Conduit
5.	DTS-SD

WIRING DIAGRAM



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.

TS150 FIRESTAT FOR "REOPENABLE" FIRE AND SMOKE DAMPERS OPERATION INSTRUCTIONS SUPPLEMENT

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

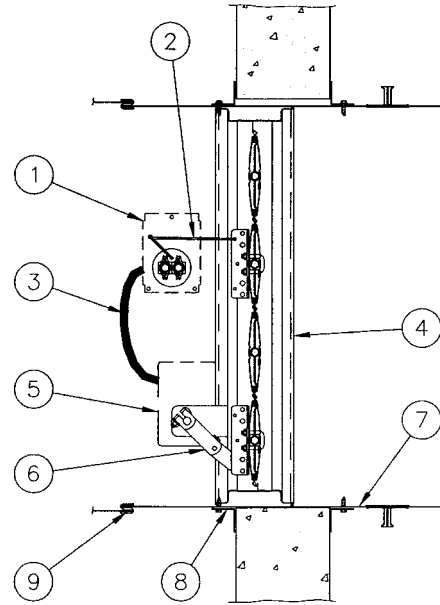
If smoke is detected, or during testing, or if power failure occurs, the damper will close and lock. When the smoke signal ceases (or smoke detector resets), the test is complete or power is restored the SYSTEM will automatically REMOTE RESET the damper to the open position. The damper automatically 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.



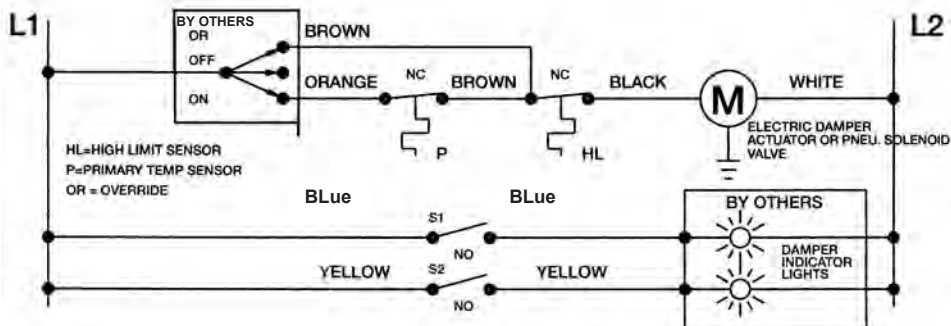
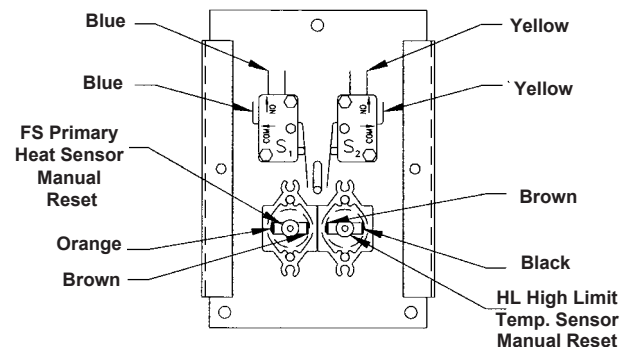
ITeM

1. TS-150 Fire Stat
2. Adjustable Connecting Rod
3. Flex Conduit
4. Damper Frame
5. Actuator or EP Switch

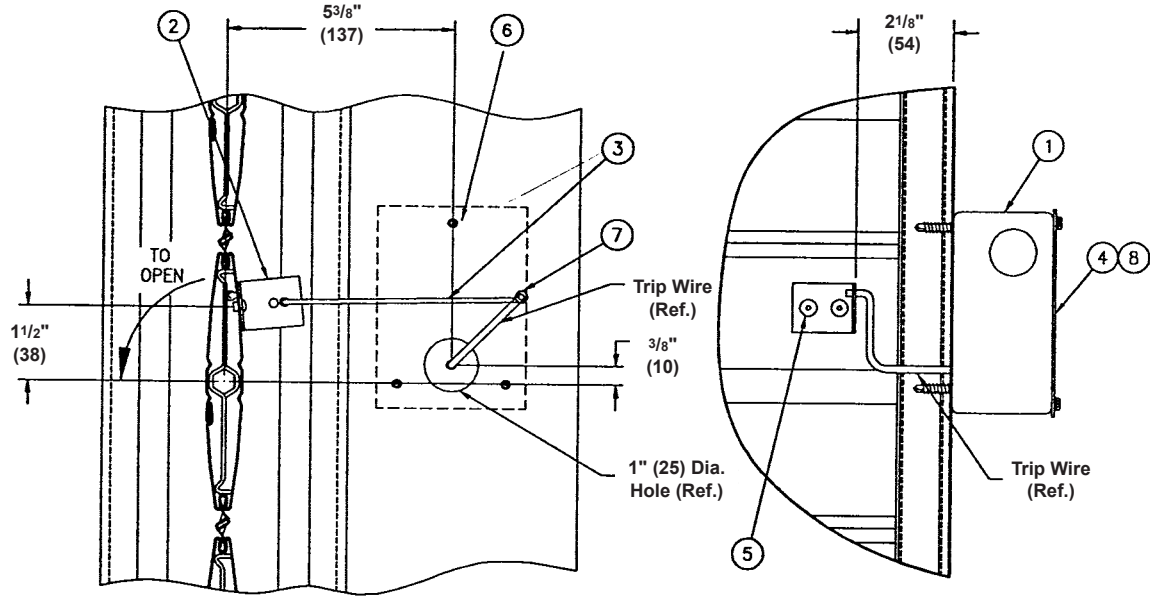
ITeM

6. Over-Center Lock
7. Damper Sleeve
8. FAST, PFMA or conventional mounting angles
9. Sleeve to Duct Connection (by others)

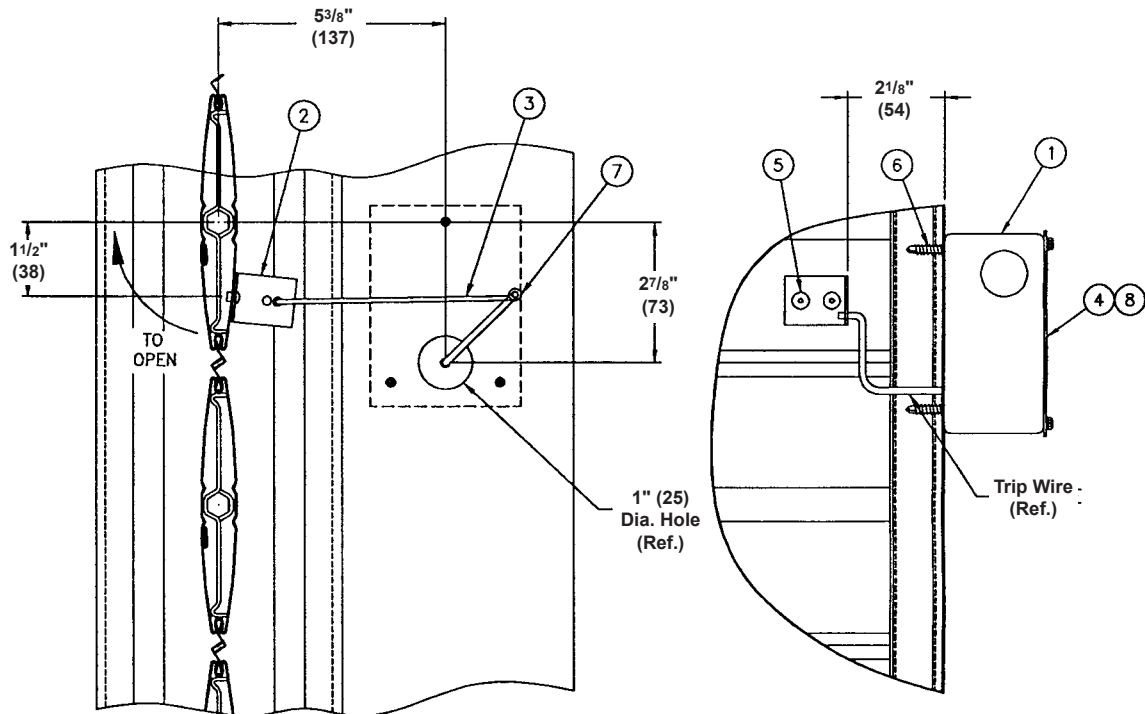
S1 and S2 Switch AMP Ratings: 15 AMPS, @ 24, 125 or 250 VAC 1/2 AMP, @ 125 VDC, 1/4 AMP, @ 250 VDC



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

CLASSIFIED



US

SEE COMPLETE MARKING
ON PRODUCT

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.

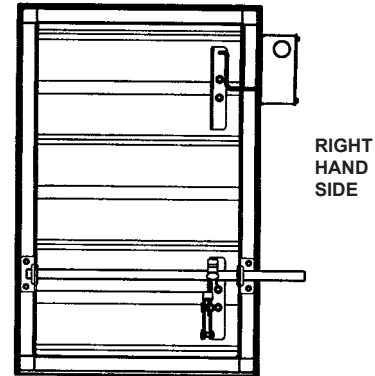
If the 1" (25) dia. hole cannot be located as indicated, locate it as close as possible to the dimensions shown.

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).

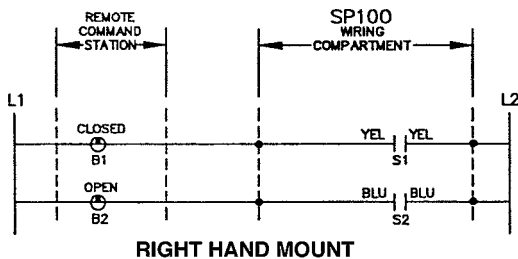
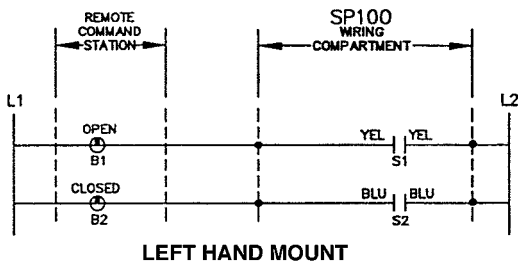
Dimensions in parenthesis () indicate millimeters.

PARTS LIST (refer to page 1)

ITEM	DESCRIPTION	TY.
1	SP100	1
2	Blade Bracket	1
3	Link Rod	1
4	Cover Plate	1
5	Pop Rivet, 1/8" x 1/4"	2
6	Screw, #10 x 1/2"	3
7	Push Nut, 3/32"	1
8	Label	1



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.

B₂ – 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.

B₂ – Remote position indicator lamp.

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SP200 SWITCH PACKAGE

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, 1/3 HP, 125 OR 250 VAC

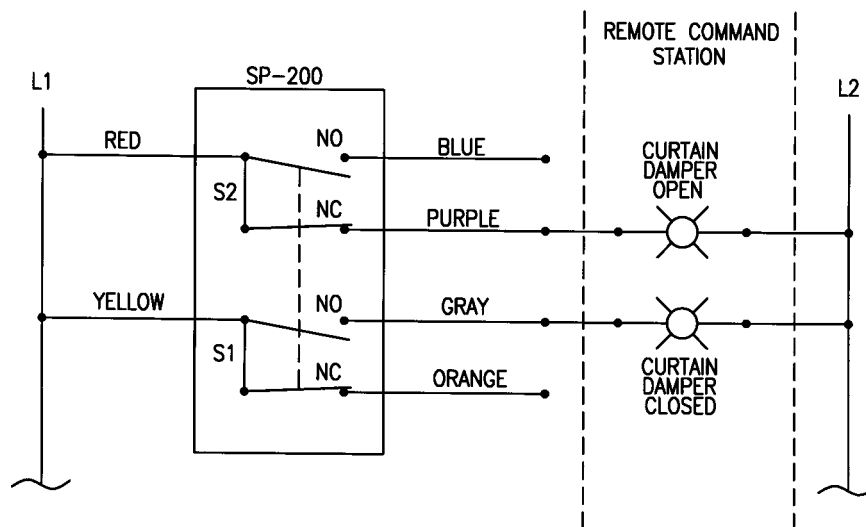
1/2 AMP, 125 VDC, 1/4 AMP, 250 VDC

5 AMPS, 120 VAC "L" (Lamp Load)

24 VDC, 1.5 AMPS

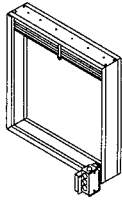
24 VAC, 10 AMPS

SP200 WIRING

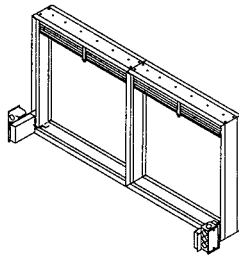


WIRING DETAIL

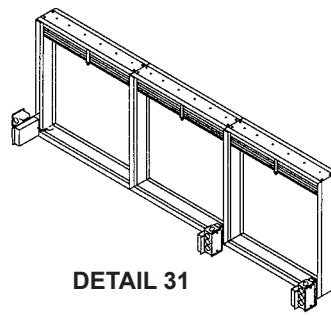
SP200 LOCATION DETAILS



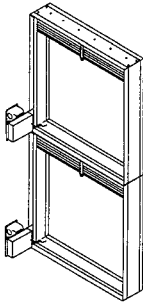
DETAIL 11



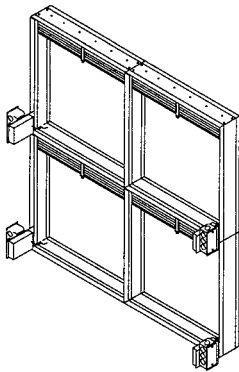
DETAIL 21



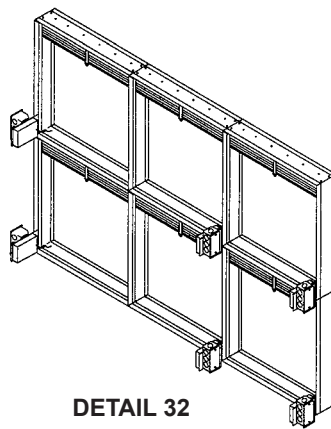
DETAIL 31



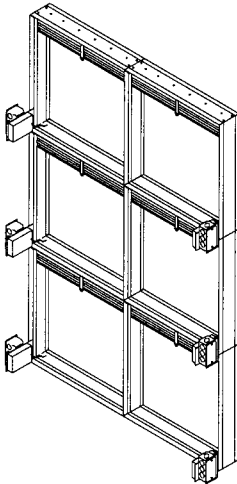
DETAIL 12



DETAIL 22



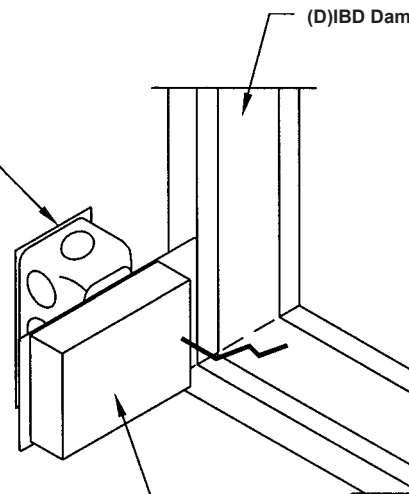
DETAIL 32



DETAIL 23

2 x 4 Handy Box

(D)IBD Damper



SP-200

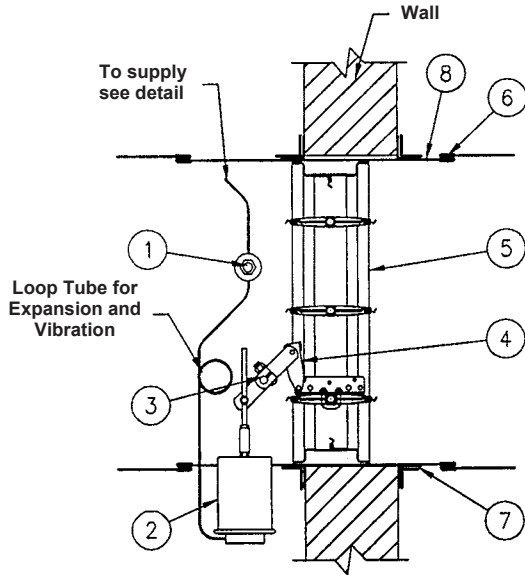
Standard Mounting Detail

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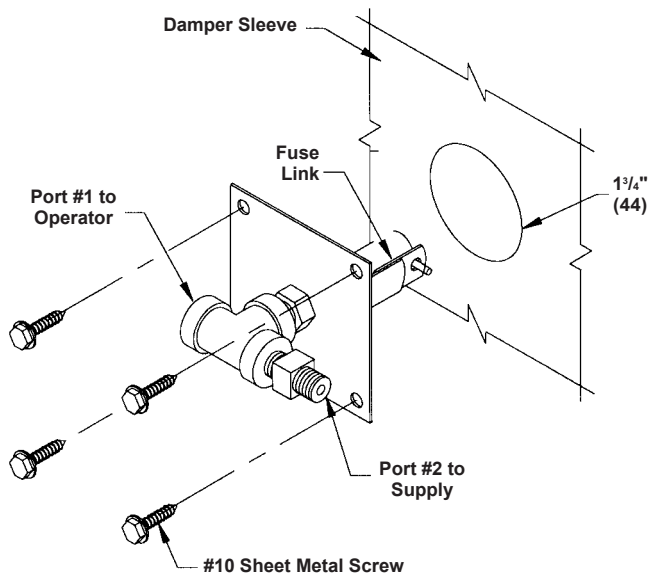
Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

PFL PNEUMATIC FUSE LINK OPERATION INSTRUCTIONS SUPPLEMENT



- | ITEM | DESCRIPTION |
|------|--|
| 1. | Pneumatic Fuse Link (PFL) |
| 2. | Pneumatic Actuator |
| 3. | Auxiliary Shaft |
| 4. | Over-Center Lock |
| 5. | Damper Frame |
| 6. | Sleeve to Duct Connection (by others) |
| 7. | FAST, PFMA or conventional mounting angles |
| 8. | Sleeve |

SWITCH PIPING DETAIL



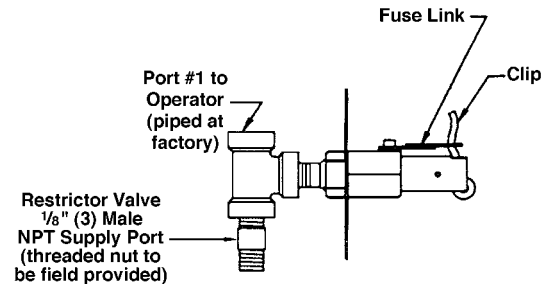
APPLICATION

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:

PSI	10	15	20	25	30
EXHAUST RATE CFM	.37	.47	.52	.55	.62



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.

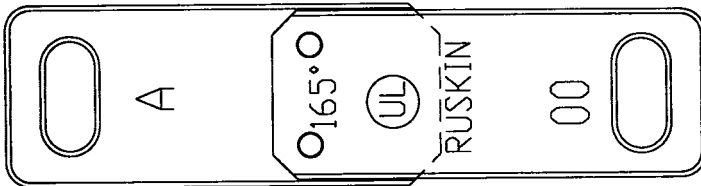


SEE COMPLETE MARKING
ON PRODUCT

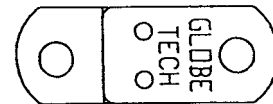
FUSE LINK ACCESSORIES FOR IBD, CFD, FD, AND FSD MODELS

FUSE LINK Specify 165 F, 212 F, or 285 F (74 C, 100 C or 141 C)

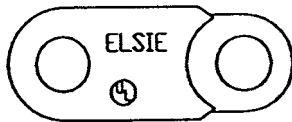
Issue A Link
All (D)IBD Curtain Type Fire Dampers
Excluding IBDT Series



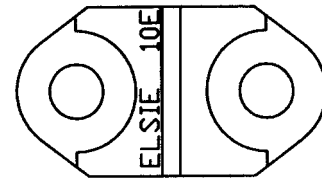
J Link
All CFD Ceiling Fire Dampers
All PFL's (Pneumatic Fuse Links)



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



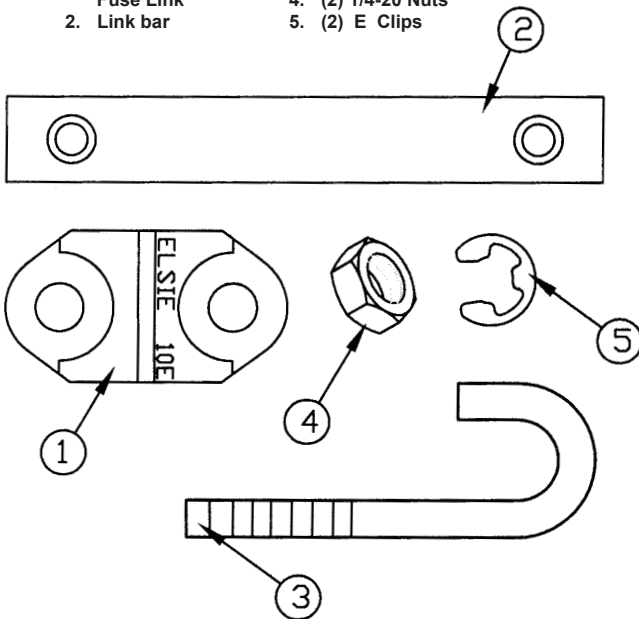
Issue E Link
FD35 and FD36
Multiple Blade Fire Dampers



FUSE LINK Specify 165 F, 212 F, or 285 F (74 C, 100 C or 141 C)

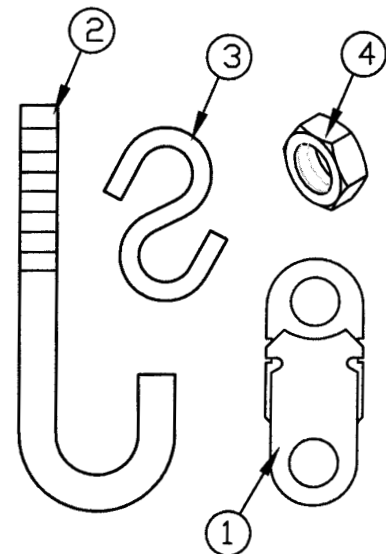
FD Fuse Link Assembly

- | | |
|----------------------|--------------------|
| 1. Issue E Fuse Link | 3. (2) S Hooks |
| 2. Link bar | 4. (2) 1/4-20 Nuts |
| | 5. (2) E Clips |

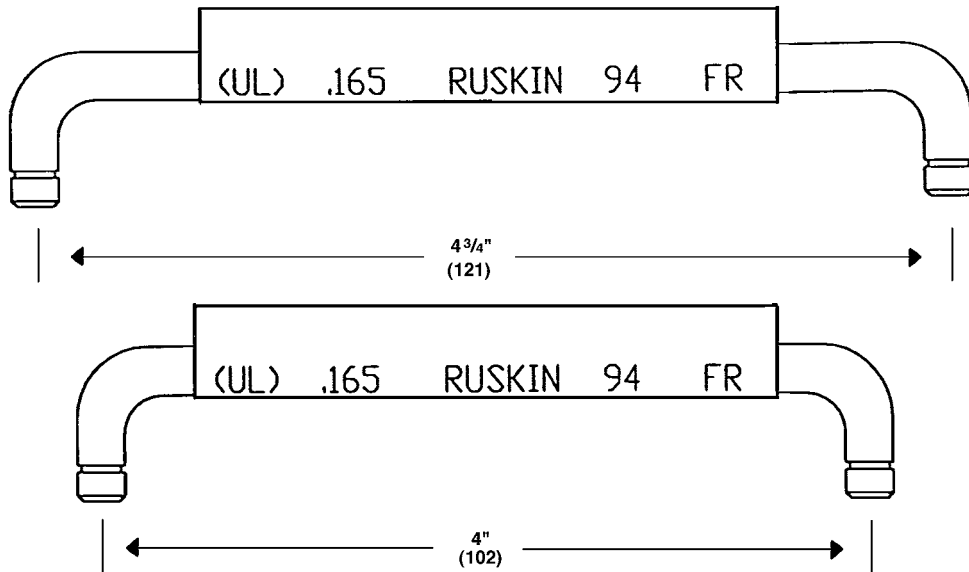


FDR Fuse Link Assembly

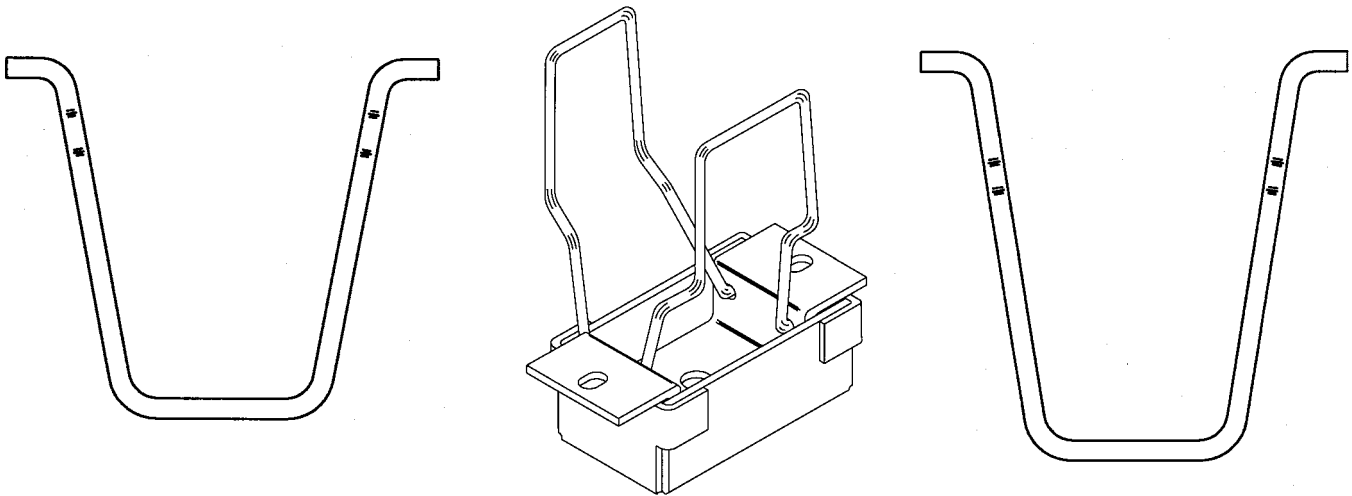
- | | |
|----------------------|--------------------|
| 1. Issue B Fuse Link | 3. (2) S Hooks |
| 2. J Bolt | 4. (2) 1/4-20 Nuts |



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)



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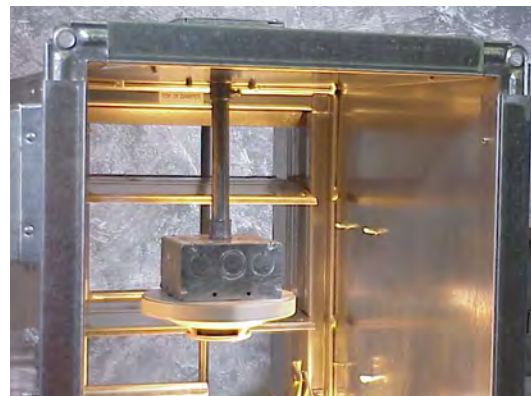
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Duct Smoke Detectors



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



PRODUCT APPLICATION AND INSTALLATION INSTRUCTIONS DSDF-D4120 (System Sensor) FLOW DUCT SMOKE DETECTORS

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

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.**

DSDF DESCRIPTION/SPECIFICATION

Model: System Sensor D4120 with sensor component D4S

Type: Photoelectric.

Velocity: 100 fpm to 4,000 fpm.

Dimensions (L x W x D): 14³/₈" x 5" x 2¹/₂" (365 x 127 x 64) or 7³/₄" x 9" x 2¹/₂" (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

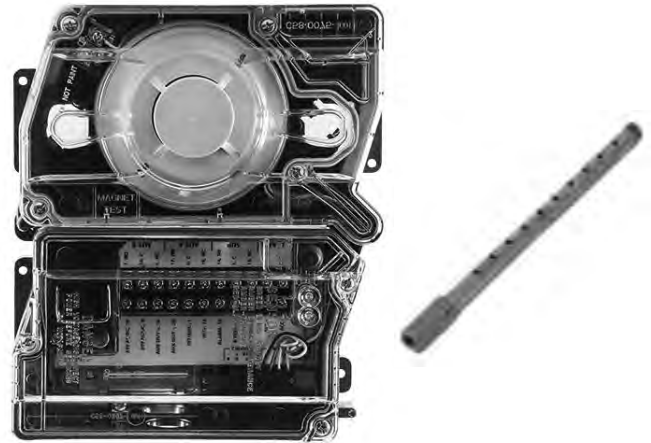
ACCESSORIES

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.

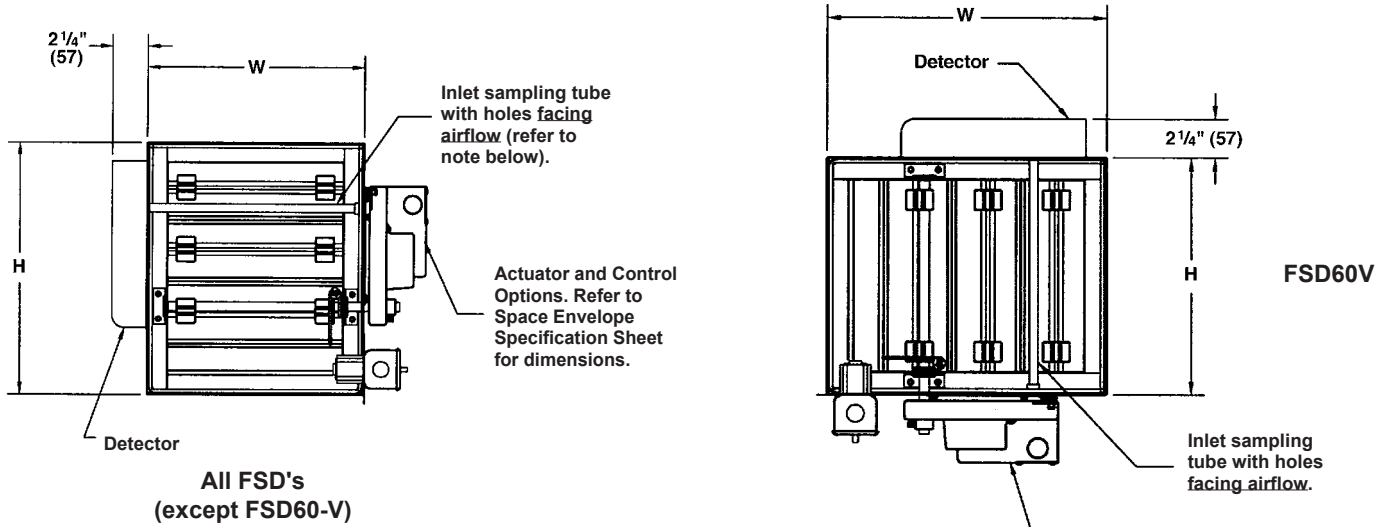
NOTE: Dimensions shown in parentheses () indicate millimeters.



SEE COMPLETE MARKING
ON PRODUCT

FACTORY MOUNTING DETAILS

The DSD-D4120 is standardly mounted on the opposite side of the sleeve from the actuator.

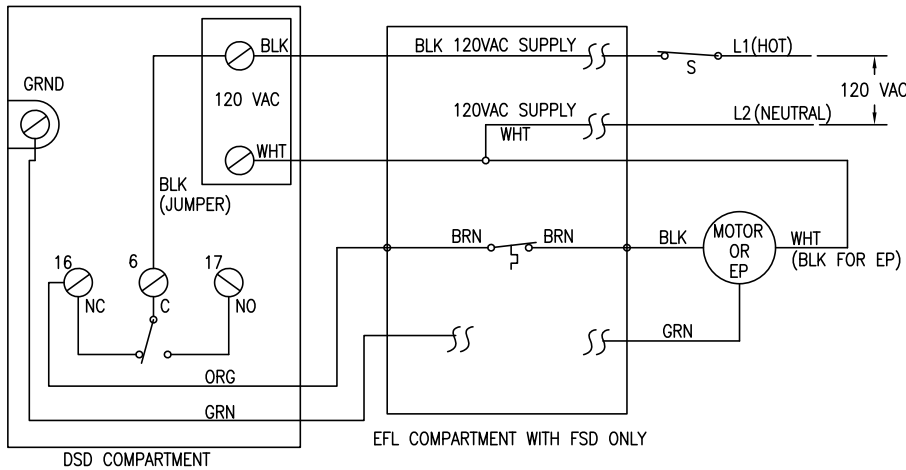


All FSD's
(except FSD60-V)

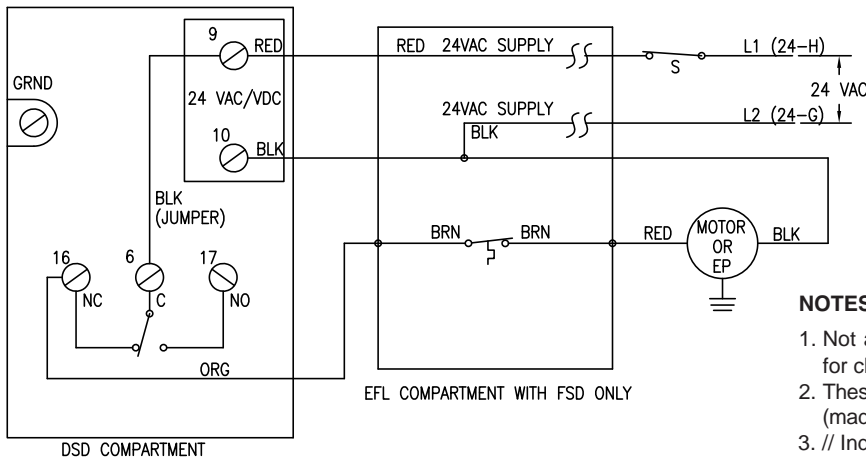
NOTE: Ruskin factory installs the duct smoke detector with holes in sampling tube pointed away from the damper. The sampling tube must be rotated in the field so the holes are pointed in the direction of the air flow. Minimum damper size is 8" wide x 6" high (203 x 152) (actual size).

Actuator and Control Options. Refer to Space Envelope Specification Sheet for dimensions.

DSDF-D4120 FACTORY WIRED TO FSD WITH EFL



EFL AND 120 VAC SUPPLY

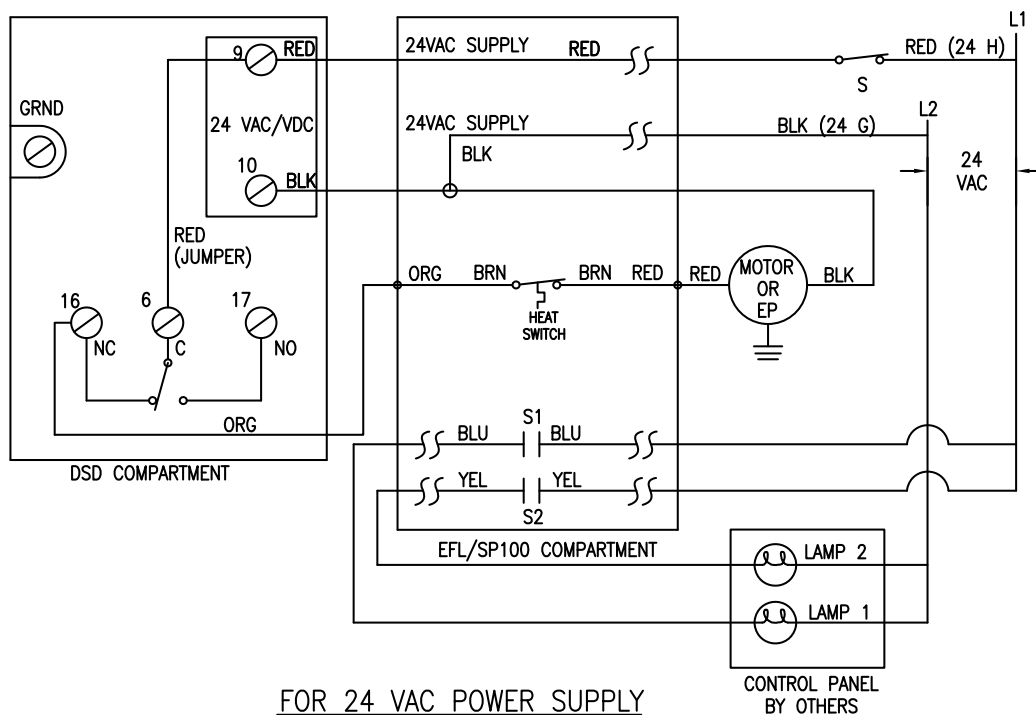
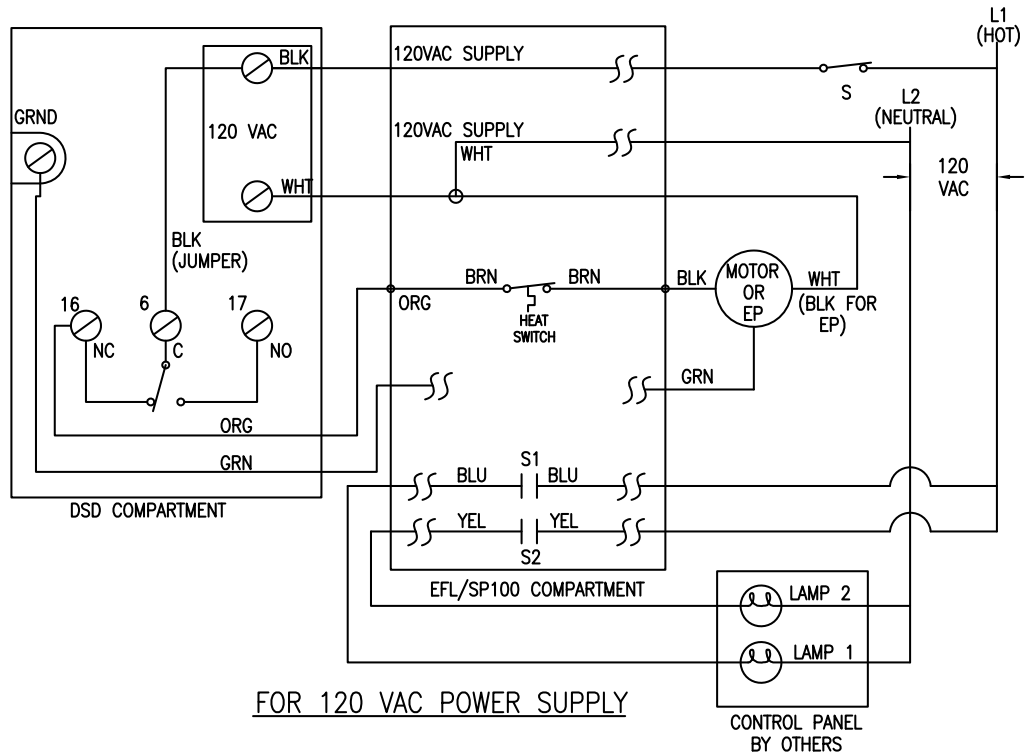


EFL AND 24 VAC SUPPLY

NOTES

1. Not all screw terminals Ø 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.

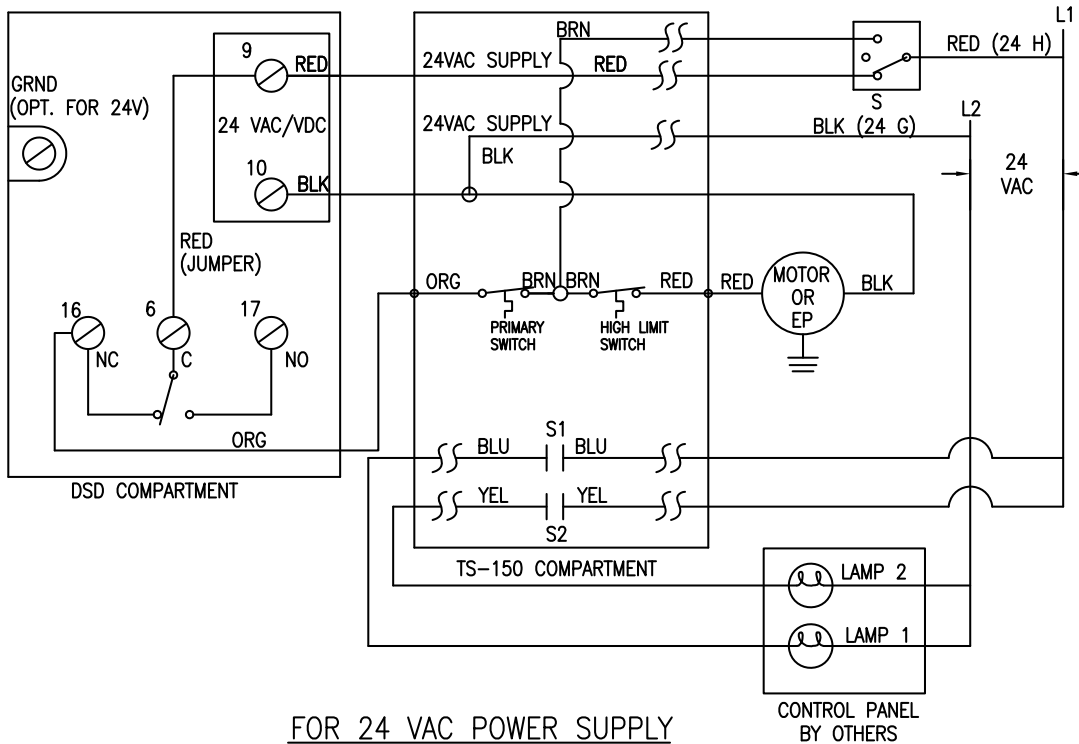
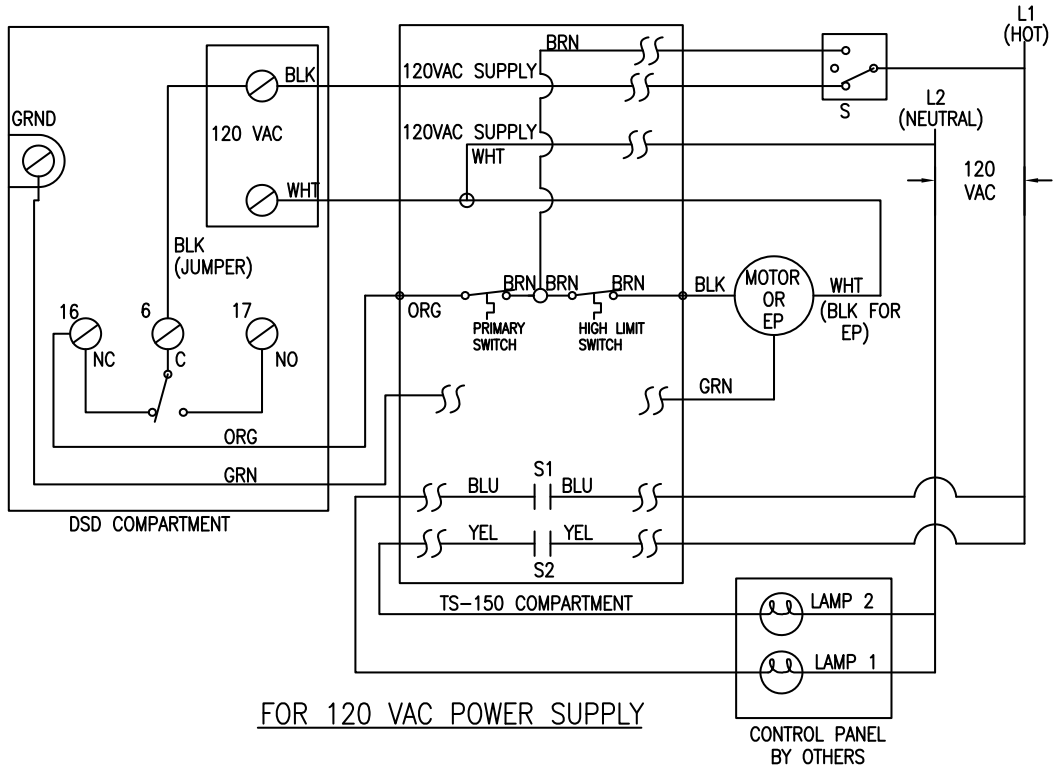
DSD-F-D4120 FACTORY WIRED TO FSD WITH EFL/SP100



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.

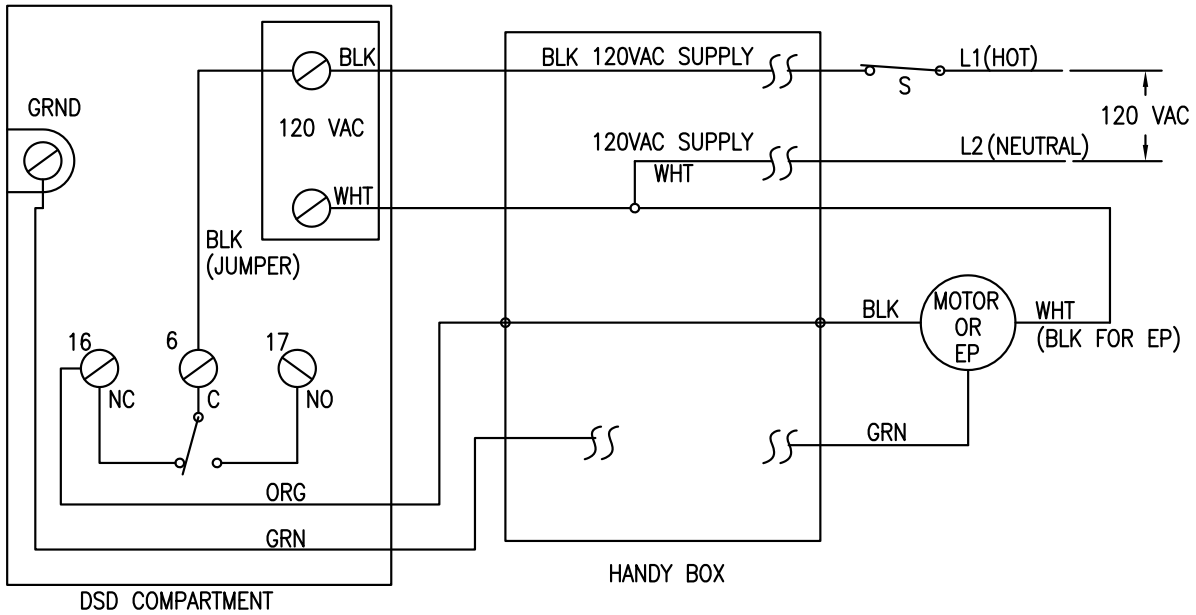
DSDF-D4120 FACTORY WIRED TO FSD WITH TS-150



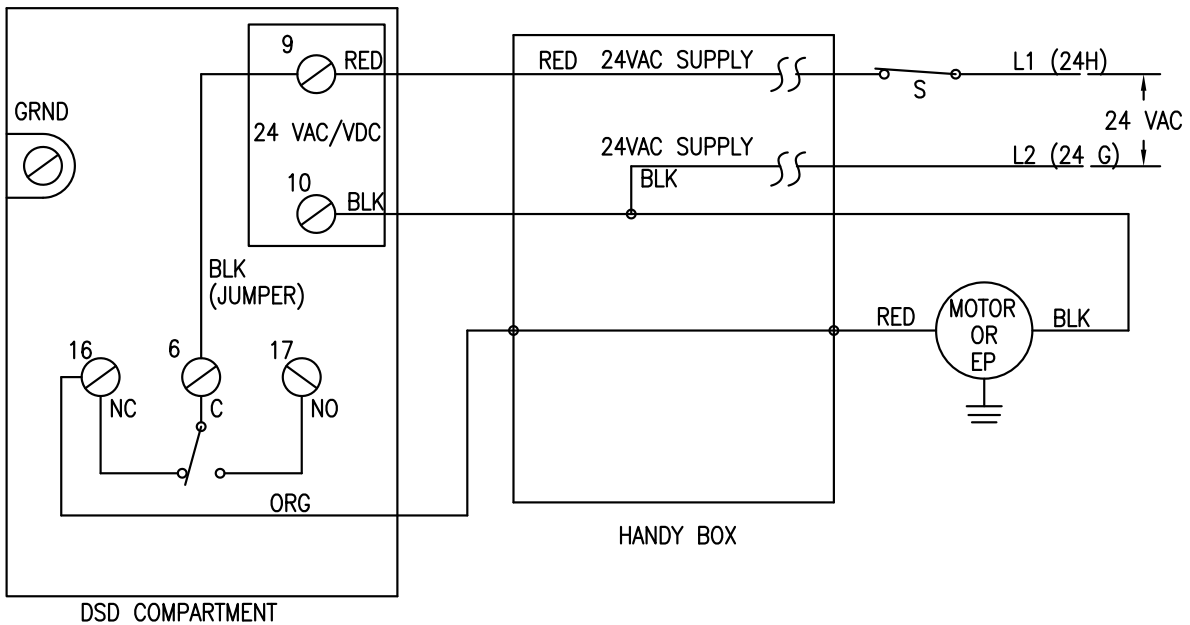
NOTES

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.

DSD-F-D4120 FACTORY WIRED TO SMOKE DAMPER



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: Photoelectric.

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/VDC or 120 VAC operation.

Contact Ratings: Refer to information provided with detector.

Latching Alarm: Reset by momentary power interruption (not automatic).

LISTINGS OF DSDN

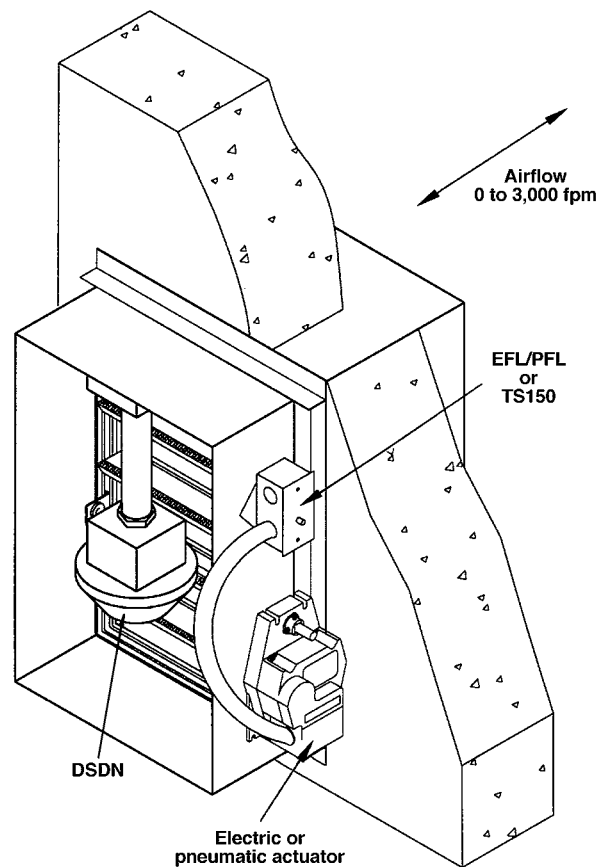
- UL Listed, file S911.
- CSFM Listing, 7272-1209:159.
- New York MEA-205-94-E
- Factory Mutual Approved, OX5A4.AY.

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.

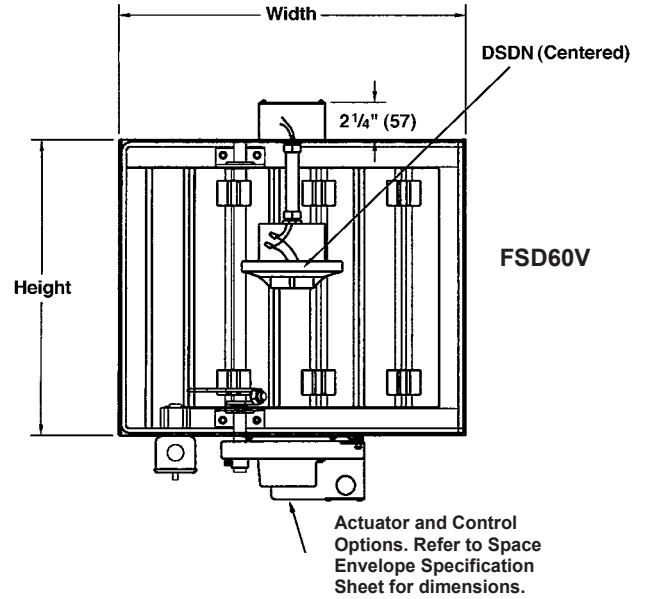
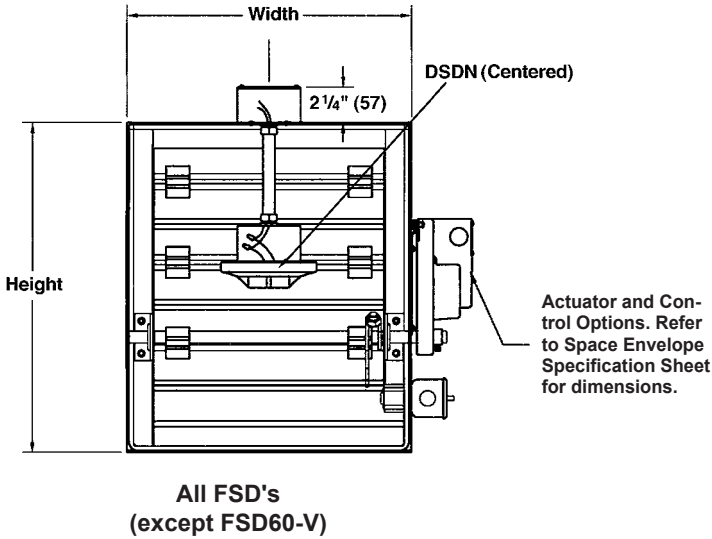


SEE COMPLETE MARKING
ON PRODUCT

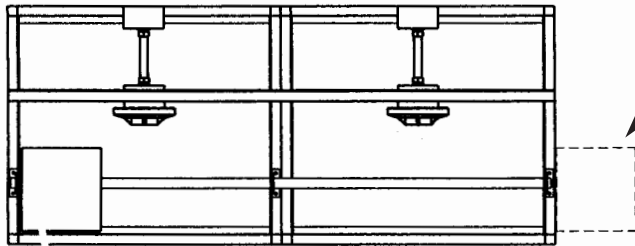
FACTORY MOUNTING DETAILS

NOTES:

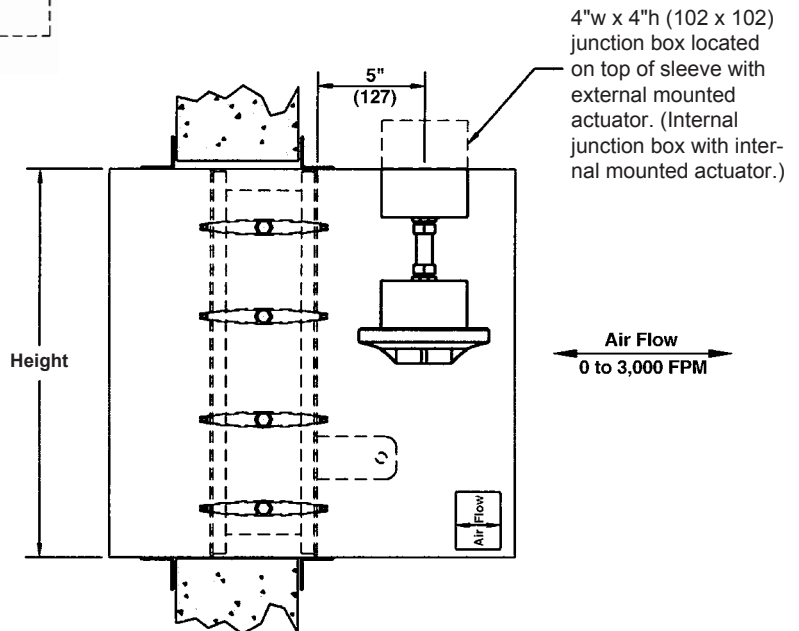
- 1) Consult Ruskin for minimum size for actuator in airstream.
- 2) Multiple detectors required for dampers larger than 36" w x 36" h (914 x 914). Consult Ruskin



TYPICAL INSTALLATION DETAILS FOR FSD with DSDN



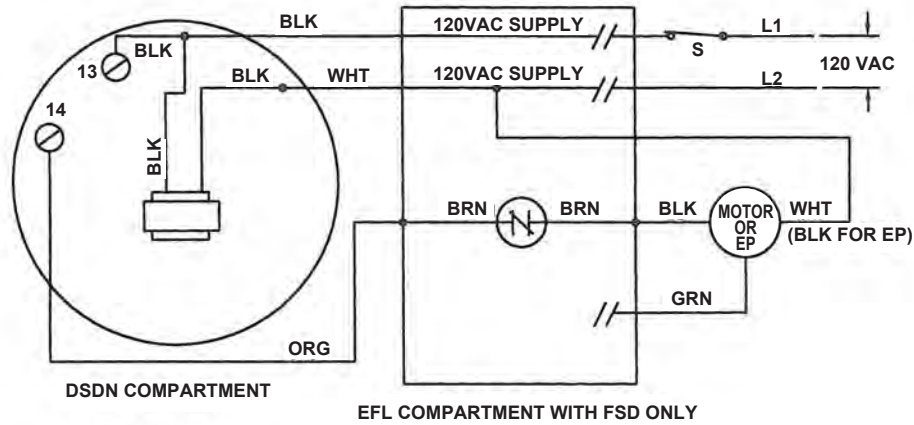
Multiple detectors required for dampers larger than 36" x 36" h (914 x 914).



WIRING DIAGRAMS 120 VAC

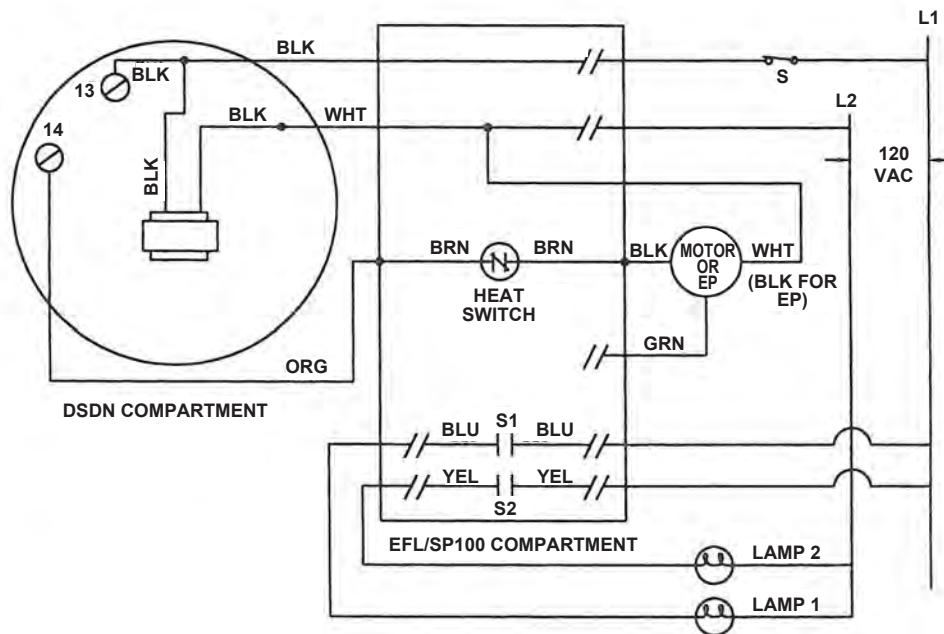
DSDN FACTORY WIRED TO FSD WITH EFL

Fire Smoke Damper (FSD) with Electric Fuse Link (EFL)



DSDN FACTORY WIRED TO FSD WITH EFL/SP-100

Fire Smoke Damper (FSD) with Electric Fuse Link/SP-100 Switch

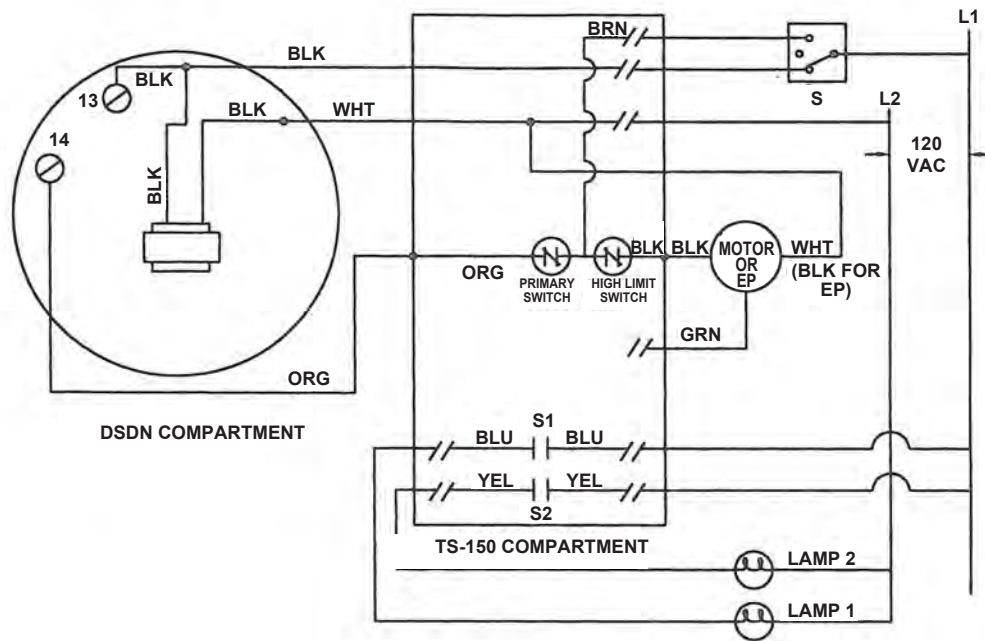


NOTES

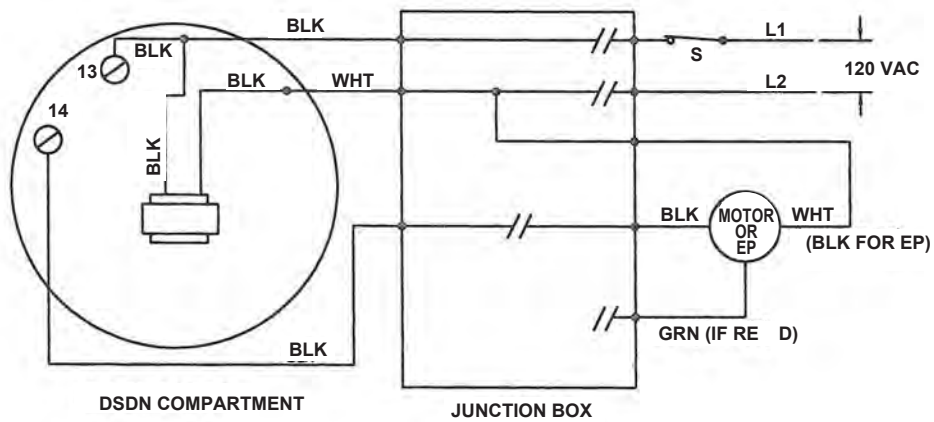
1. Not all screw terminals \emptyset in the DSDN compartment are shown, for clarity.
2. Switch "S" by others.
3. These wiring diagrams apply to model with either photoelectric or ionization detector head.
4. // Indicated connections needed to be made in the field by qualified electrician.

WIRING DIAGRAMS 120 VAC

DSDN FACTORY WIRED TO FSD WITH TS-150

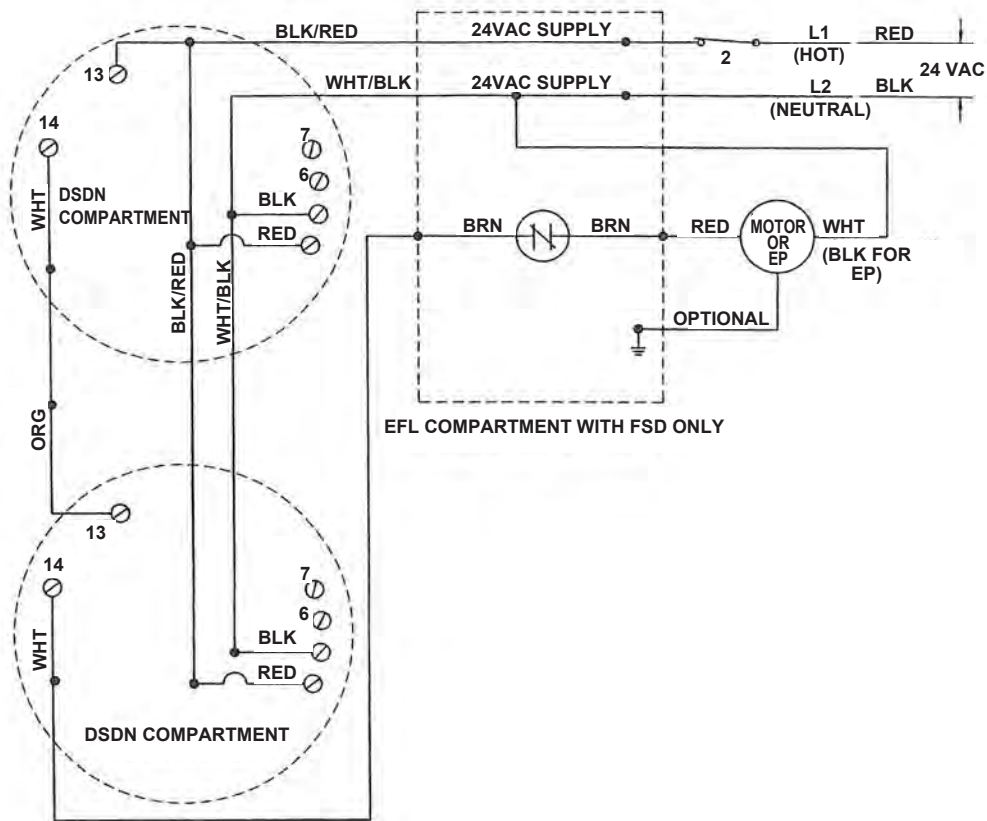


DSDN FACTORY WIRED TO SMOKE DAMPER

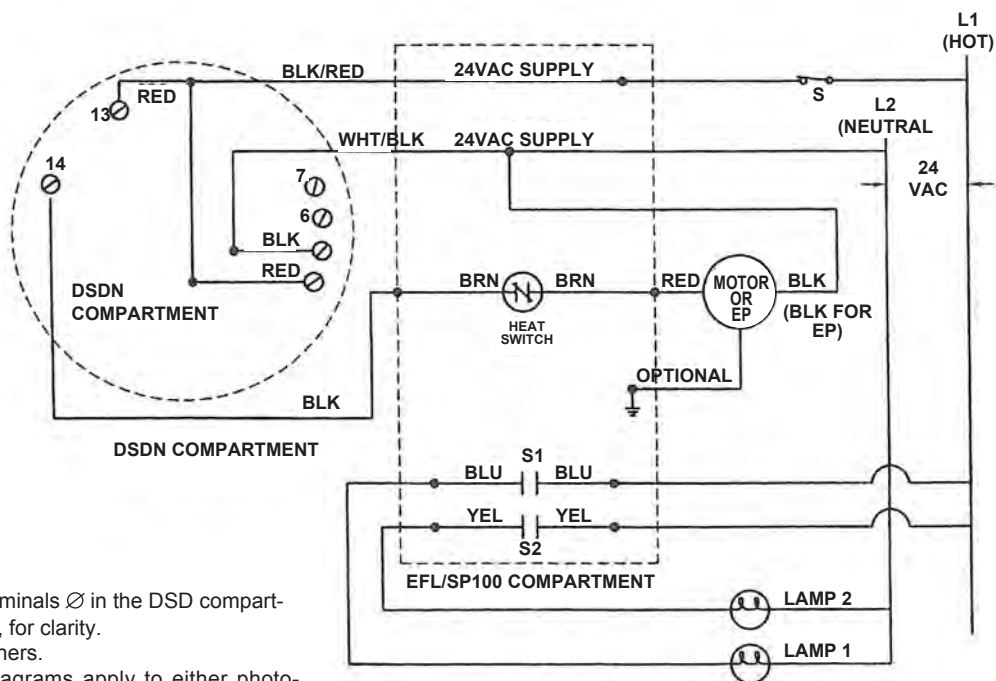


WIRING DIAGRAMS 24 VAC/DC

DSDN FACTORY WIRED TO FSD WITH EFL



DSDN FACTORY WIRED TO FSD WITH EFL1SP-100

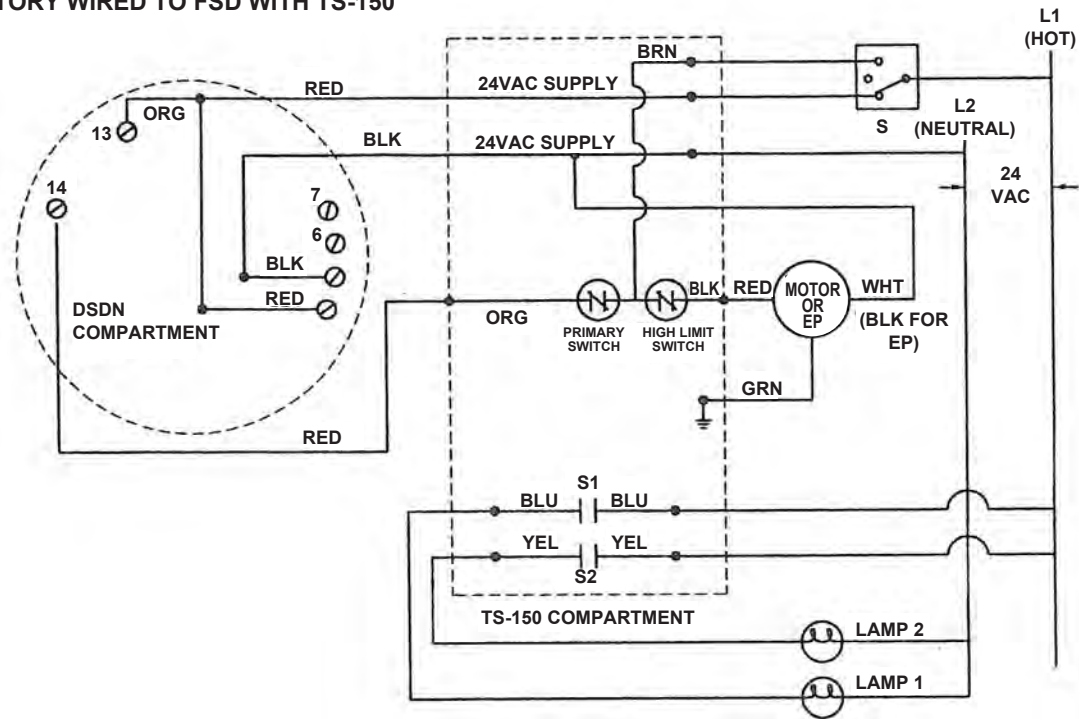


NOTES

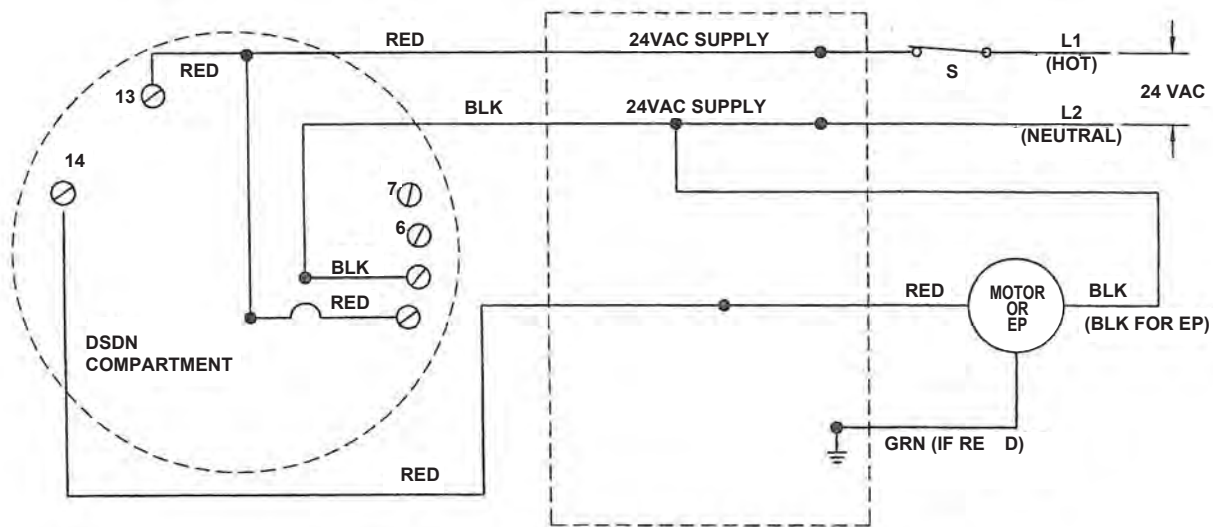
1. Not all screw terminals ∅ in the DSD compartment are shown, for clarity.
2. Switch "S" by others.
3. These wiring diagrams apply to either photo-electric or ionization detector head.
4. ∅ Indicated connections needed to be made in the field by qualified electrician.

WIRING DIAGRAMS 24 VAC/DC

DSDN FACTORY WIRED TO FSD WITH TS-150



DSDN FACTORY WIRED TO SMOKE DAMPER



NOTES

1. Not all screw terminals \emptyset 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.

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PRODUCT APPLICATION AND INSTALLATION INSTRUCTIONS DSDF (HOCHIKI DH-98) DUCT SMOKE DETECTORS

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: Photoelectric (Consult Ruskin for availability of Ionization type detectors).

Velocity: 300 to 4,000 fpm.

Dimensions (L x W x D): 9 1/8" x 7 1/4" x 2 1/4" (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

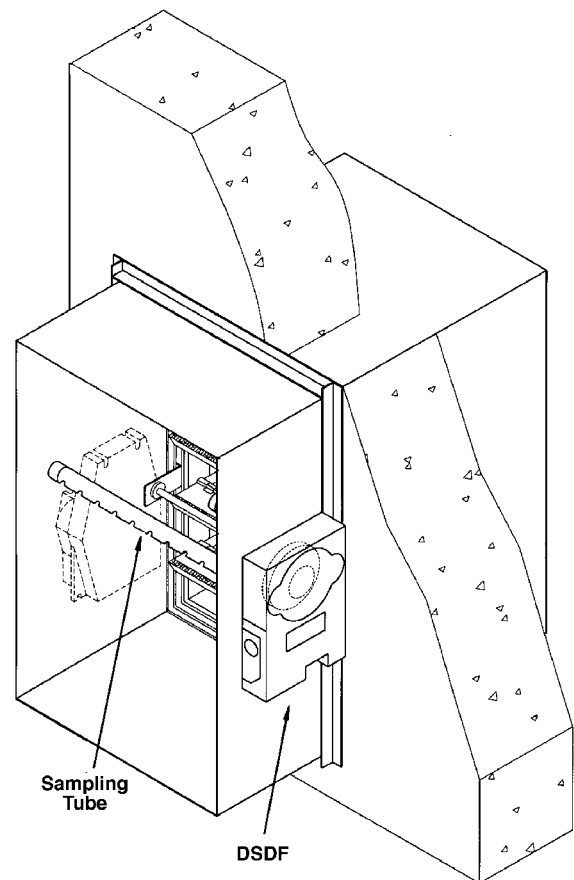
ACCESSORIES

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.

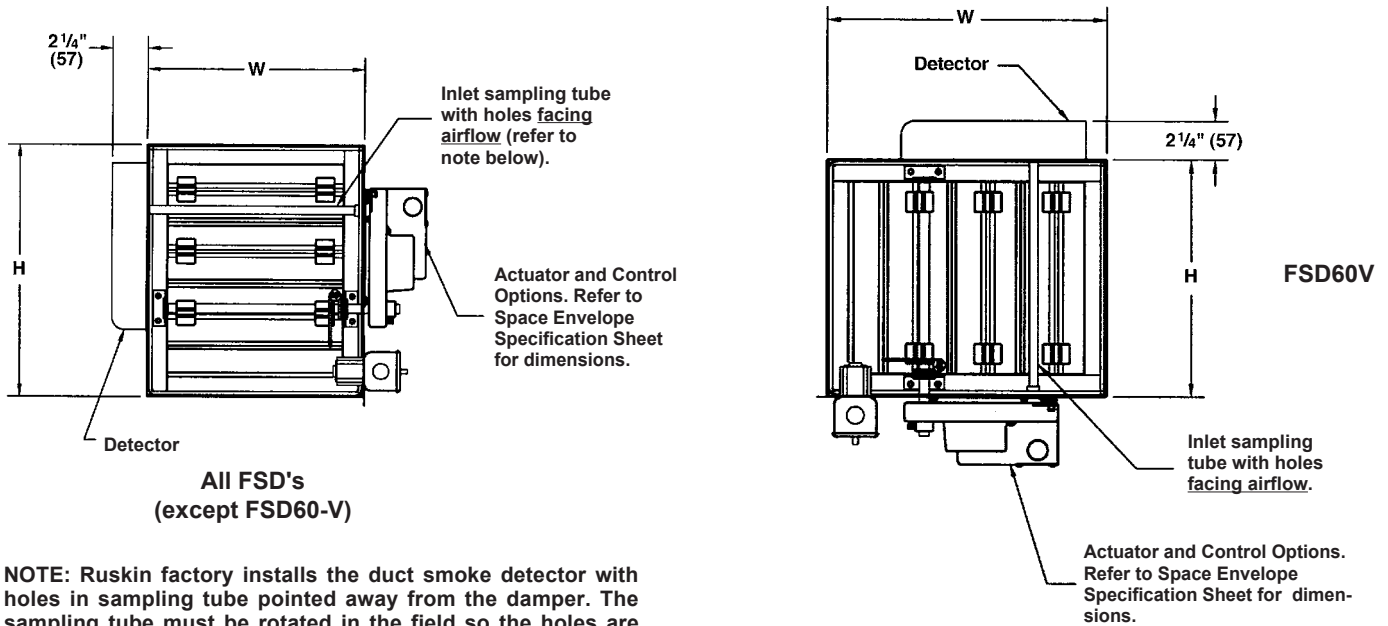
NOTE: Dimensions shown in parentheses () indicate millimeters.



SEE COMPLETE MARKING
ON PRODUCT

FACTORY MOUNTING DETAILS

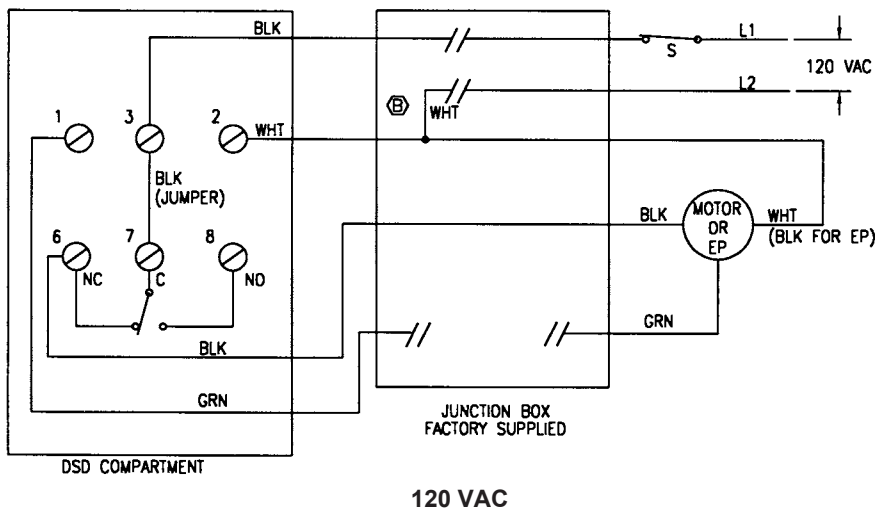
The DSD is standardly mounted on the opposite side of the sleeve from the actuator.



All FSD's
(except FSD60-V)

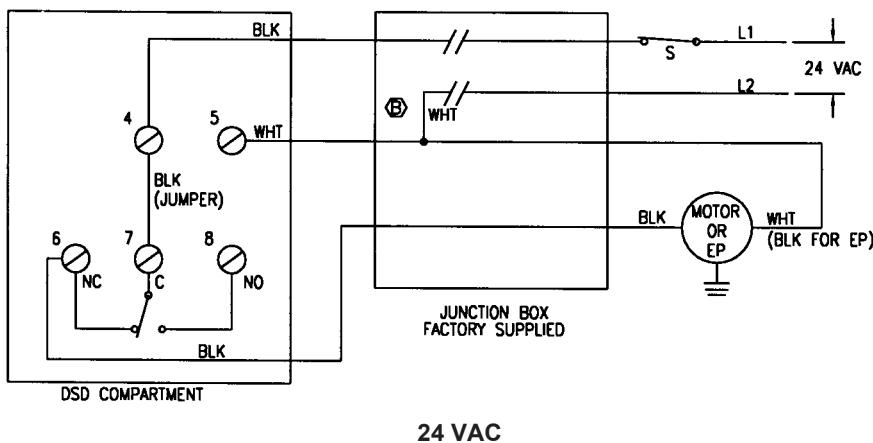
NOTE: Ruskin factory installs the duct smoke detector with holes in sampling tube pointed away from the damper. The sampling tube must be rotated in the field so the holes are pointed in the direction of the air flow. Minimum damper size is 8" wide x 6" high (203 x 152) (actual size).

DSD FACTORY WIRED TO FSD WITH EFL

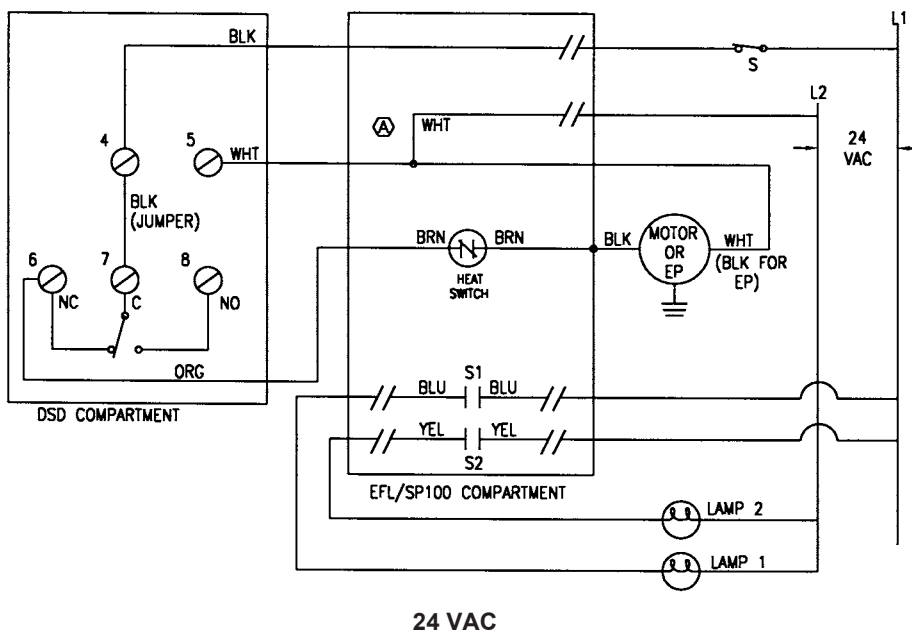
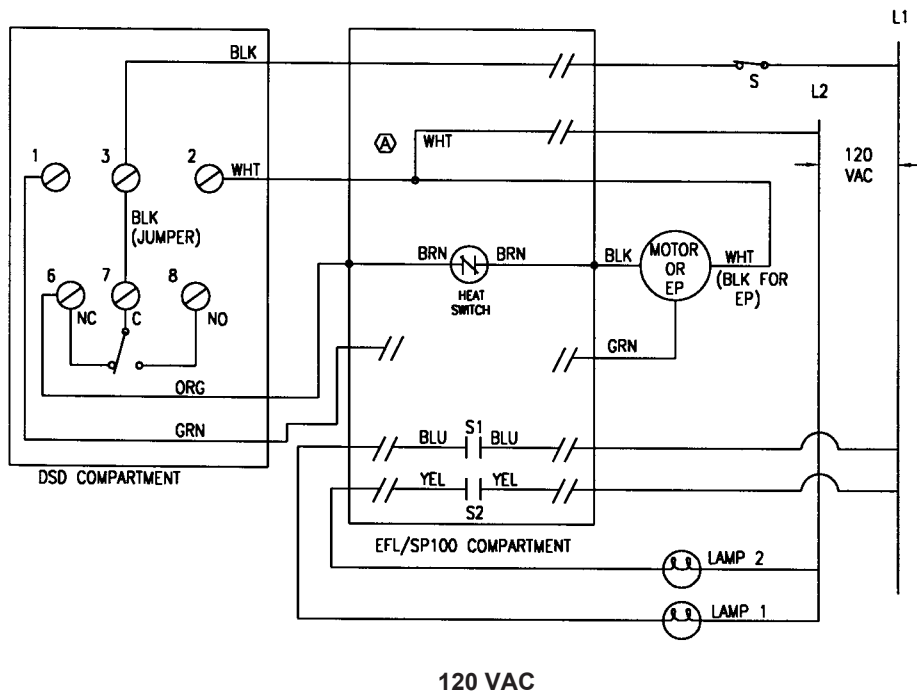


NOTES

1. Not all screw terminals Ø 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.



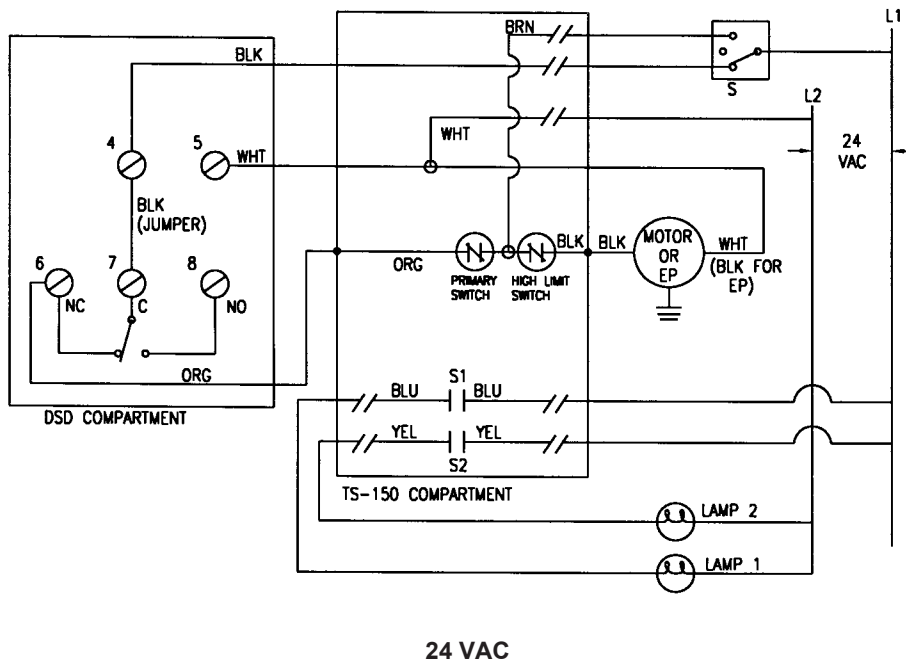
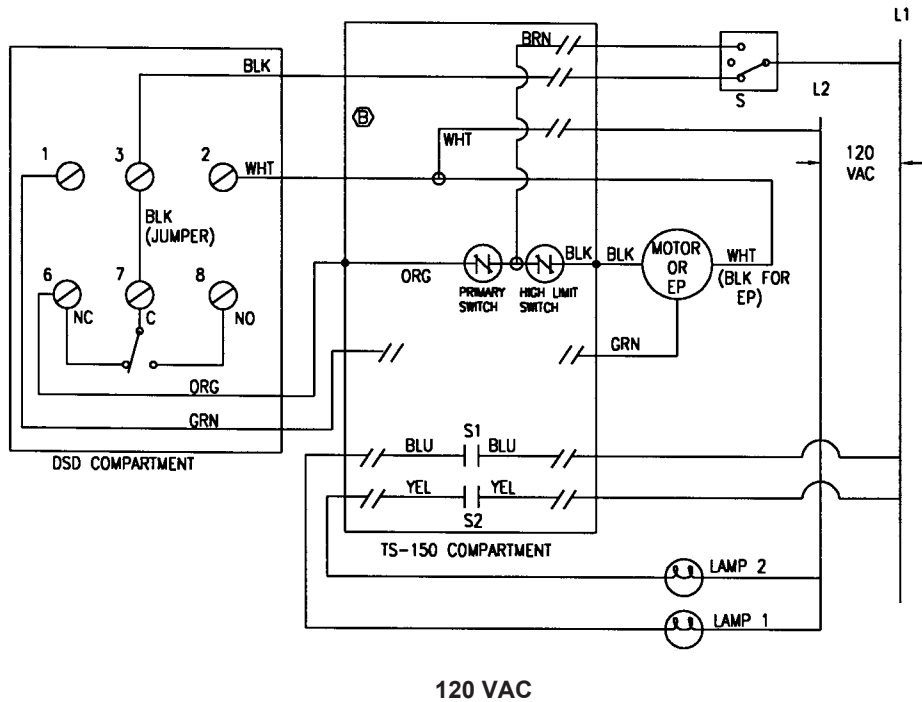
DSD FACTORY WIRED TO FSD WITH EFL/SP100



NOTES

1. Not all screw terminals ∅ 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.

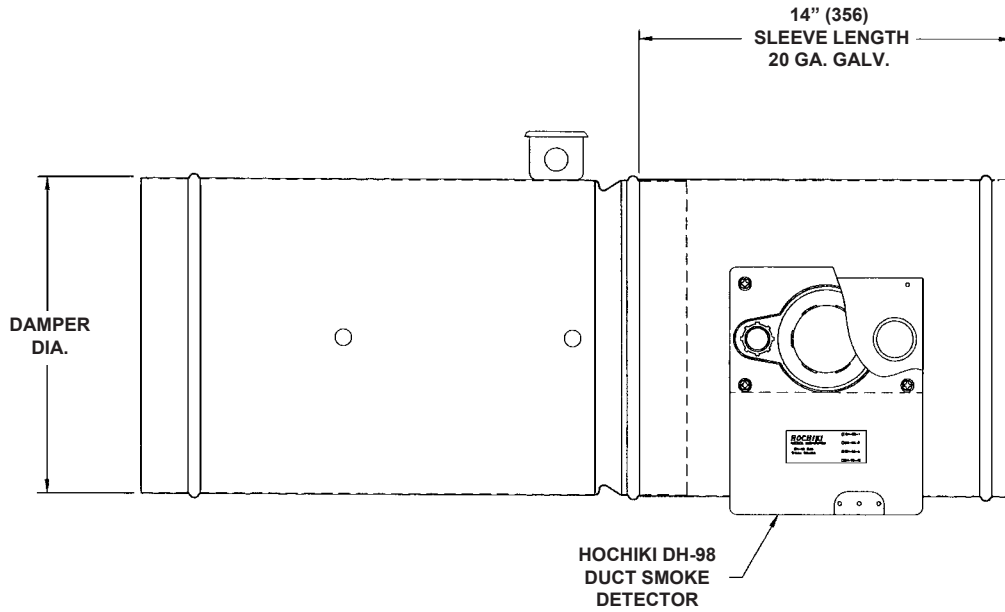
DSD FACTORY WIRED TO FSD WITH TS-150



NOTES

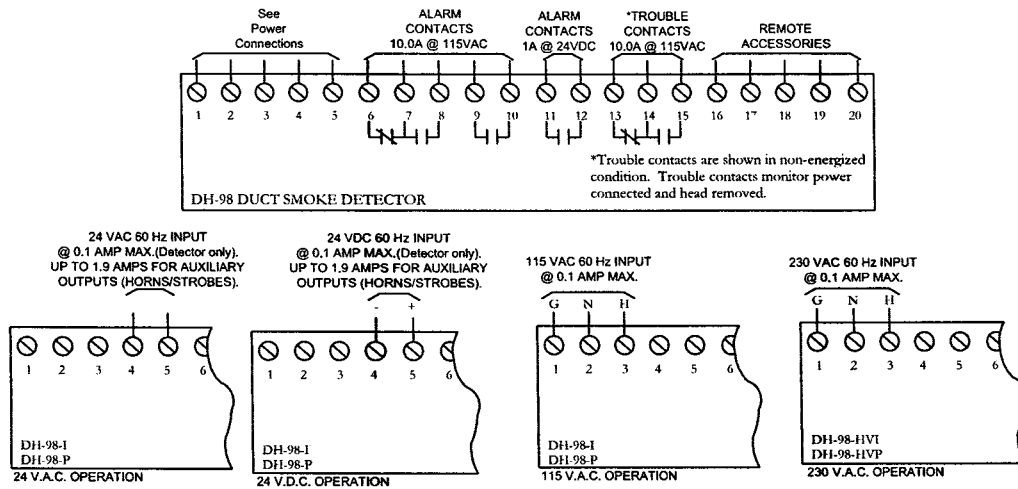
1. Not all screw terminals \emptyset in the DSD compartment are shown, for clarity.
2. Connectors between screw terminals 6, 7 & 8 are pre-wired by the DSD manufacturer. At smoke condition, contact between 6 & 7 breaks: contact between 7 & 8 makes.
3. Three position switch "S" lamp 1 and lamp 2 are by 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



FIRE ALARM CONTROL PANEL WIRING

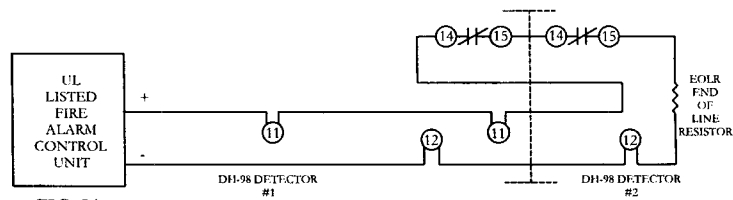


FIG. 5A

COMMON FUNCTION

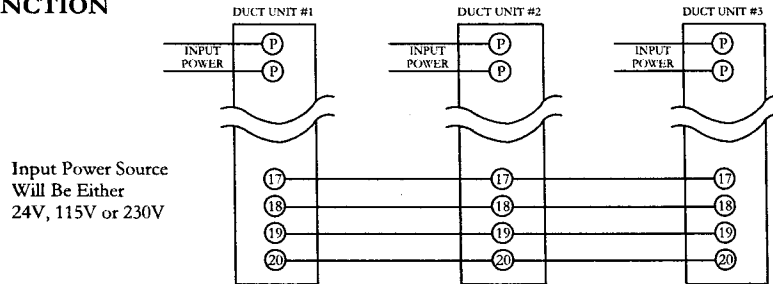


FIG. 5B

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.

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PRODUCT APPLICATION AND INSTALLATION INSTRUCTIONS DSDN (HS-100-P) 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: Air Products and Controls HS-100-P

Type: Photoelectric.

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.

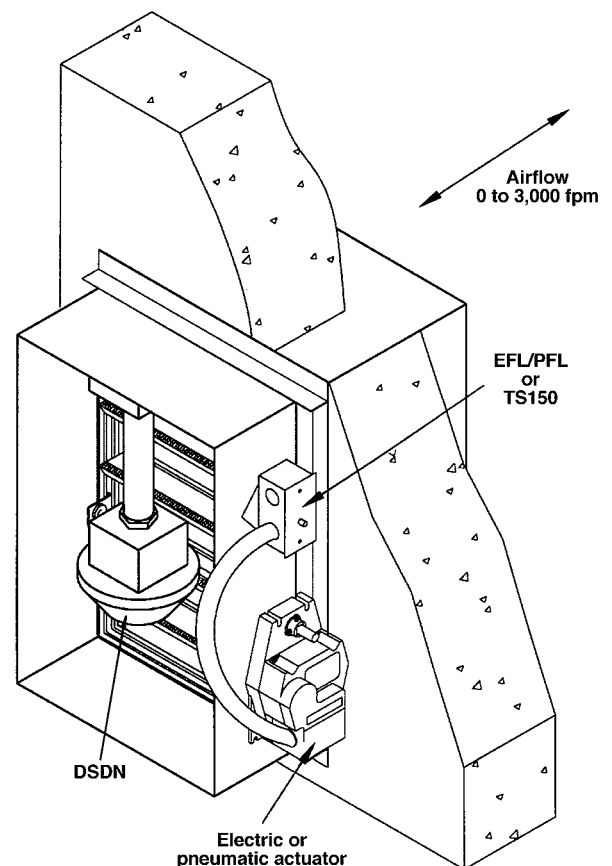
Contact Ratings: Refer to information provided with detector.

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.

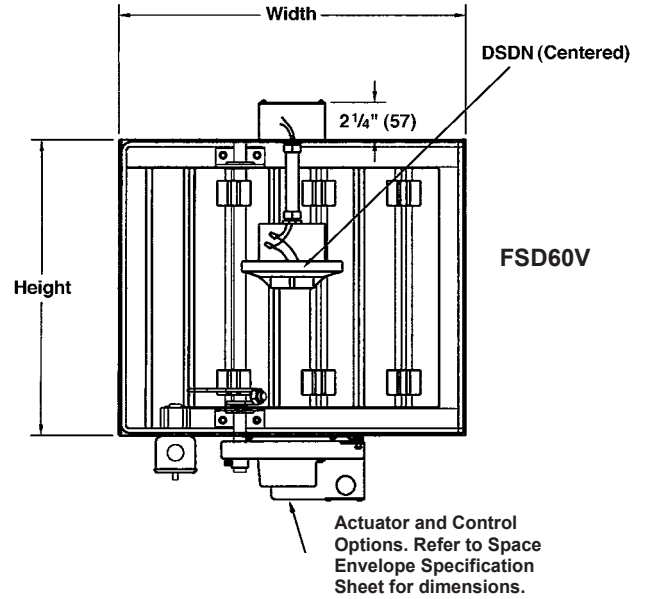
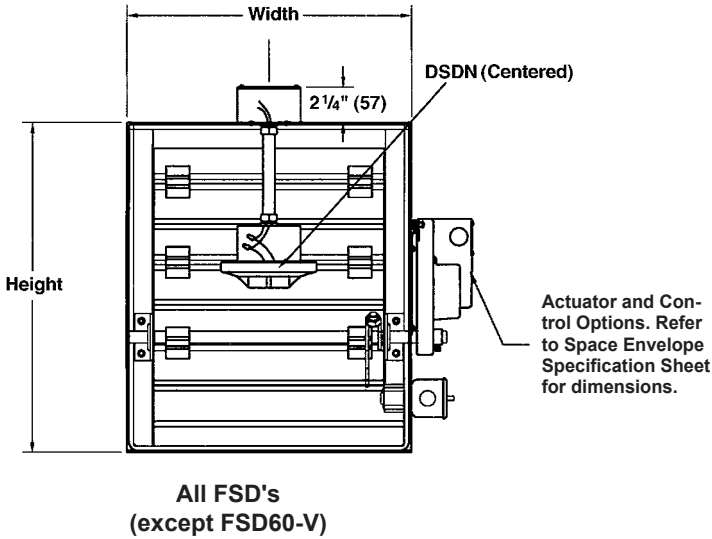


SEE COMPLETE MARKING
ON PRODUCT

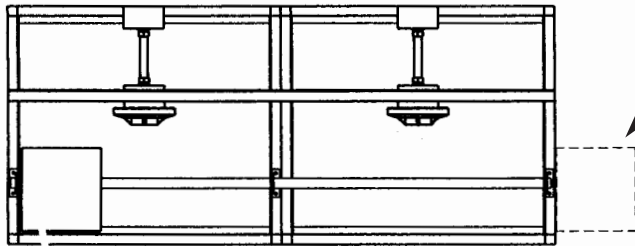
FACTORY MOUNTING DETAILS

NOTES:

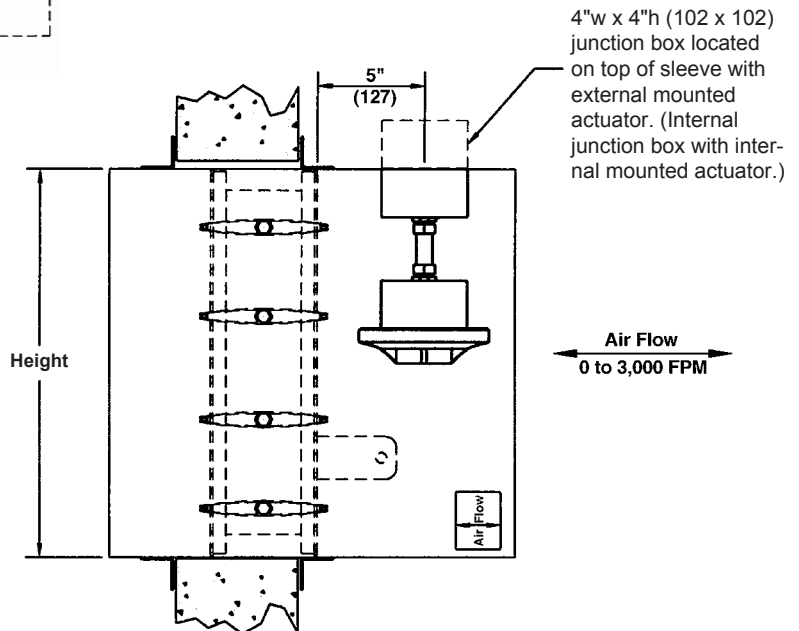
- 1) Minimum damper size is 8" w x 8" h (203 x 203).
- 2) Multiple detectors required for dampers larger than 36" w or 36" h (914 x 914).



TYPICAL INSTALLATION DETAILS FOR FSD with DSDN



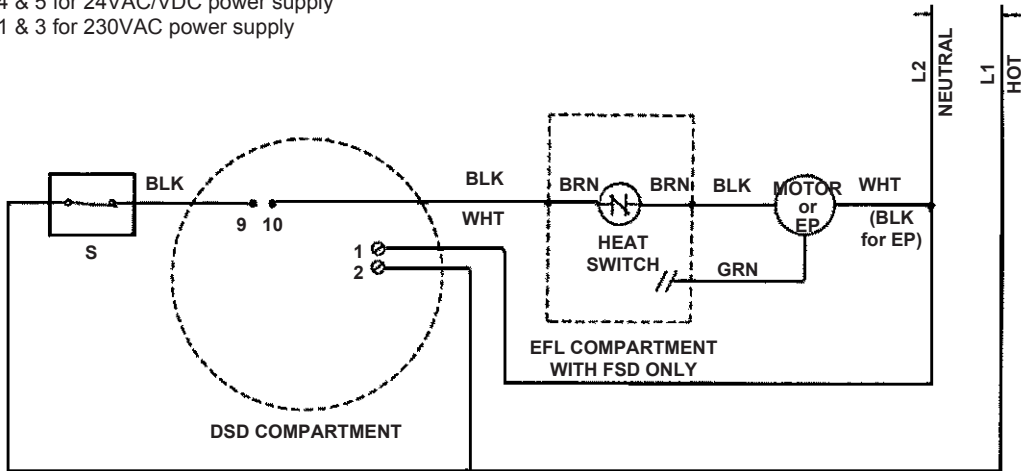
Multiple detectors required for dampers larger than 36" w or 36" h (914 x 914).



FACTORY WIRING DIAGRAMS

DSDN FACTORY WIRED TO FSD WITH EFL

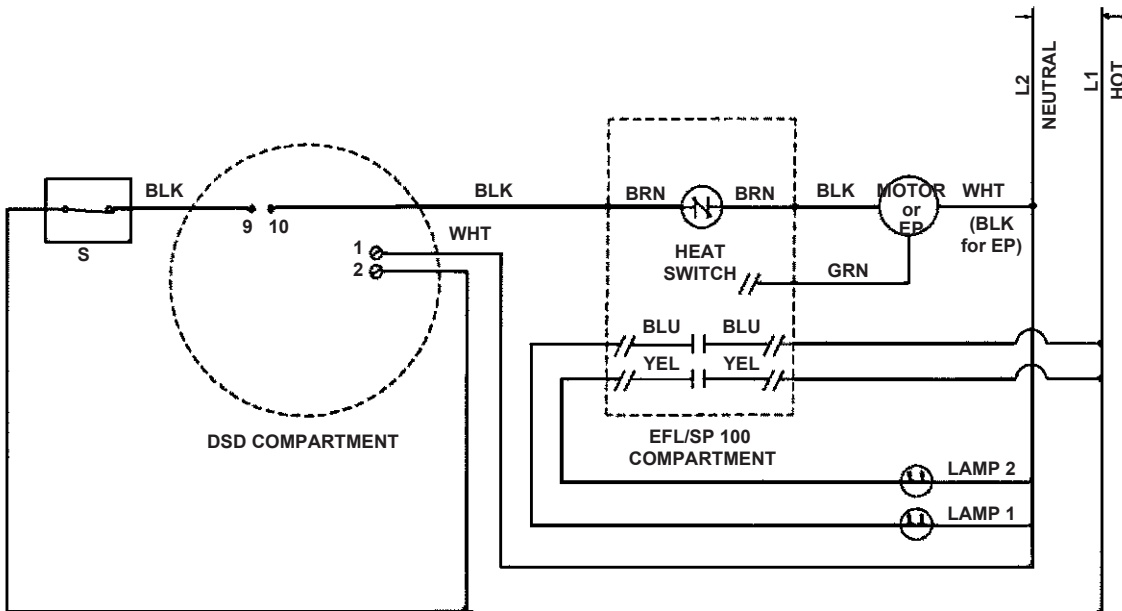
Use terminals 1 & 2 for 120VAC power supply (shown)
 Use terminals 4 & 5 for 24VAC/VDC power supply
 Use terminals 1 & 3 for 230VAC power supply



FOR 120 VAC 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



FOR 120 VAC POWER SUPPLY

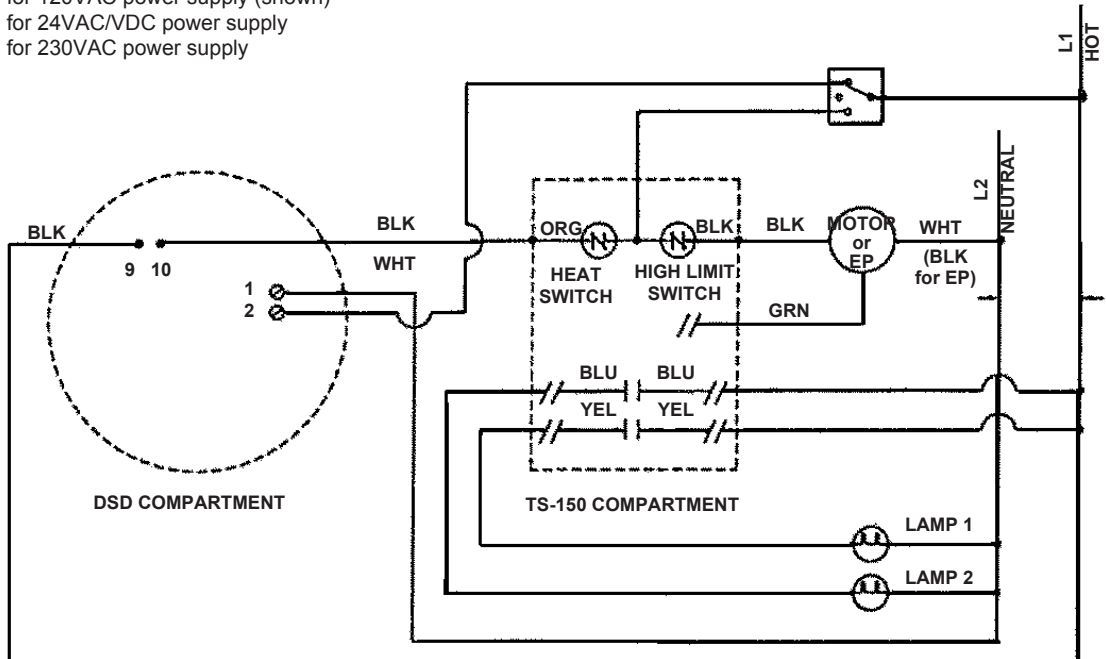
NOTES

1. Not all screw terminals \emptyset 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

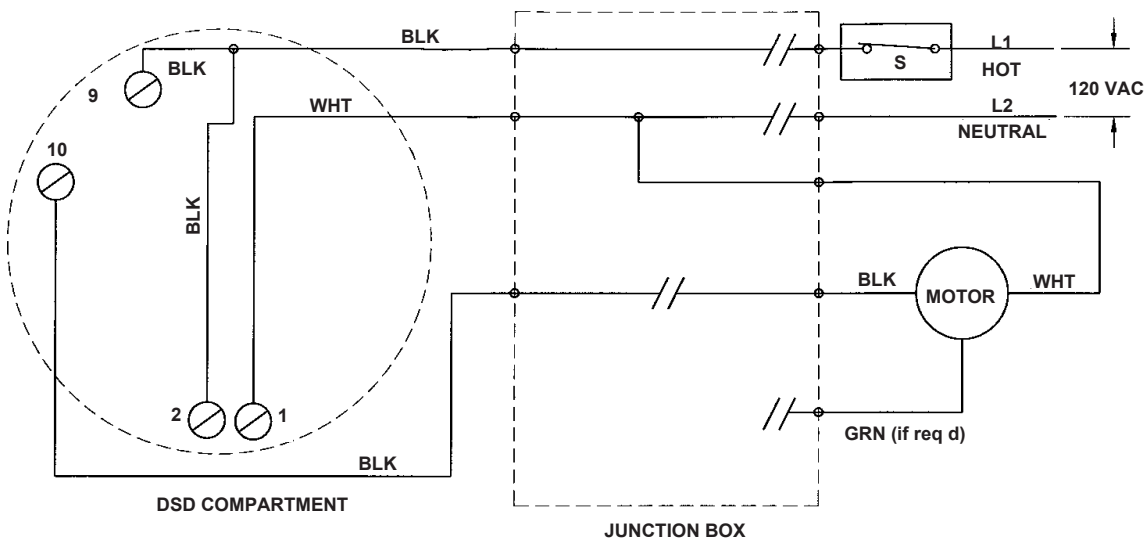
Use terminals 1 & 2 for 120VAC power supply (shown)
 Use terminals 4 & 5 for 24VAC/VDC power supply
 Use terminals 1 & 3 for 230VAC power supply



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 \emptyset 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 DAMPERS

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](#).

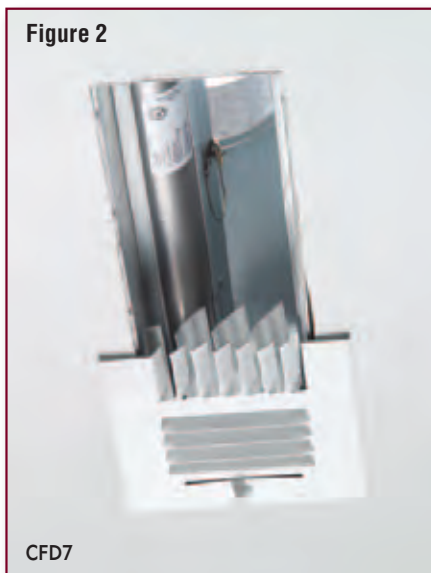
Ceiling Fire Damper Selection

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.



CEILING DAMPERS		
MODEL	HOURLY RATING	DESCRIPTION
For Non-Wood Constructed Ceilings		
CFD2	4	Rectangular
CFD3	4	Rectangular
CFD4	3	Rectangular
CFD5	4	Rectangular
CFD8	4	Rectangular
CFDR2	4	Round
CFDR3	4	Round
CFDR5	4	Round
For Wood Constructed Ceilings		
CFD7	1	Rectangular
CFD7(T)	1	Rectangular
CFDR7T	1	Round
CFD2W	1	Rectangular
CFD3W	1	Rectangular
CFDR2W	1	Round
CFDR3W	1	Round
CFD4W	1	Rectangular

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

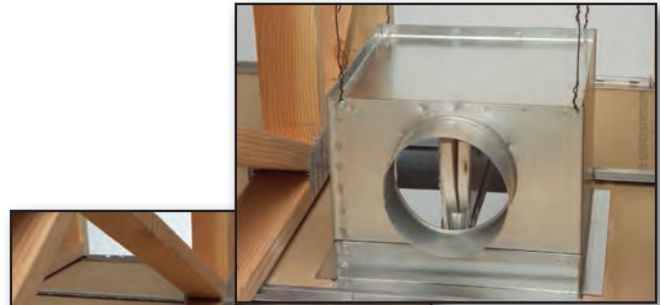
UL ceiling design numbers are actual tested hourly-rated fire resistive floor-ceiling and roof-ceiling assemblies. Each design shows construction, materials, and penetrations allowed in each design. Each manufacturers listed product may be installed as shown on their design. (L586 and P548)

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

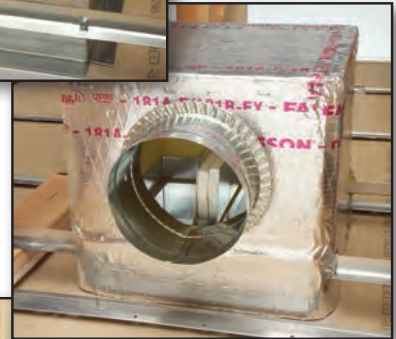
Warnock Hersey and ARL testing labs test UL approved ceiling radiation dampers in optional ceiling designs and are labeled with ARL or Warnock Hersey labels. Not all areas of the country accept non-UL labeled products and all should have the local authority approval prior to installation.



Insulated (R6/R4) or Non-Insulated Steel Plenum Box



Unducted



Ductboard Plenum Box



Steel Boot



Insulated Plenum Wood Joist



Insulated Plenum Steel Joist

NONDUCTED OR FLEX DUCT INSTALLATION

APPLICATION

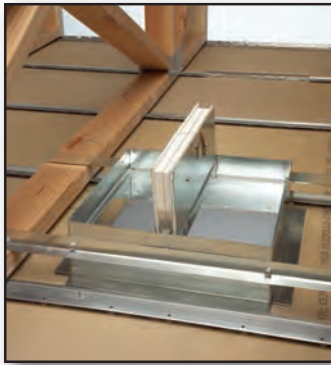
Non-ducted installations are used when the floor/ceiling or roof/ceiling cavity space is used as return air plenum which ductwork is not required. Also flex duct may be connected directly to the damper to eliminate the use of expensive insulated plenum boxes or boots.



Through Penetration



Grille with 2 1/2" OBD



Installation 1

CFD7T can be attached to angles resting on top of the bottom cord of the truss.



Surface Mount Grille



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"x4" attached to the top cord or the webbing of the trusses.



Note: installation depict standard installations, combining installation is permitted.

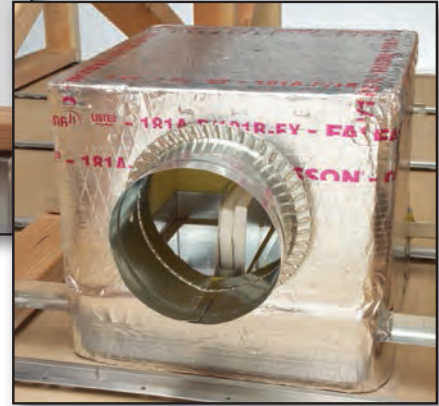
R4 OR R6 DUCTBOARD

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.



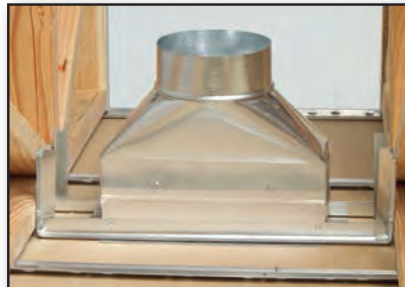
CFD7T insulated plenums may be supplied with side, end or top duct connections from 3" to 10" dia.



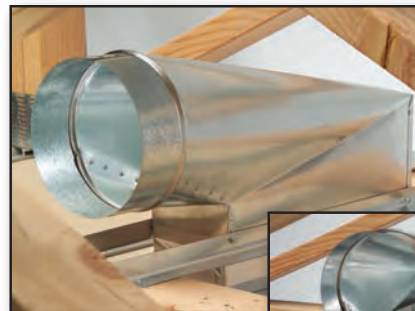
STEEL PLENUM BOX

APPLICATION

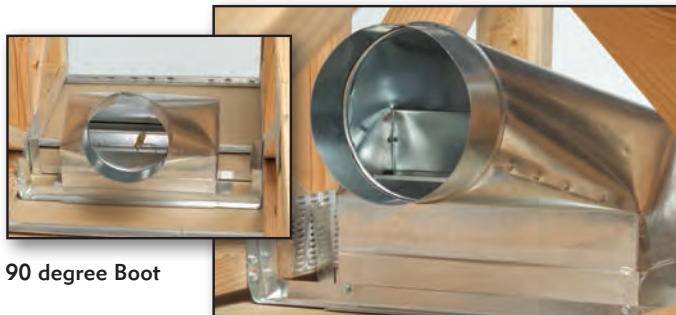
CFD7T can be supplied with various styles of steel boots or steel plenum boxes. Steel boots from a local supply house may be utilized with the CFD7T.



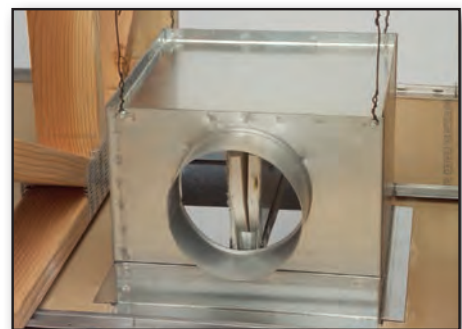
Straight Boot



End Boot



90 degree Boot



Steel Plenum Box with or without Duct liner

THROUGH CEILING MEMBRANE PENETRATION

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).

WOOD JOIST

APPLICATION

CFD7 is the first Ceiling Radiation Damper to be UL listed for 2" x10" or 2" x 12" wood joist assemblies (Ref. L501). 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).



STEEL JOIST

APPLICATION

CFD7 is the first Ceiling Radiation Damper to be UL listed for steel joist assemblies (L524).



CFD7 installs with angles attached to the sides of the joist. Angles may be factory or field supplied.

TRUE ROUND CFDR7T

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 CFDR7(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 CFDR7(T).



CFDR7T

STANDARD CEILING FIRE DAMPERS

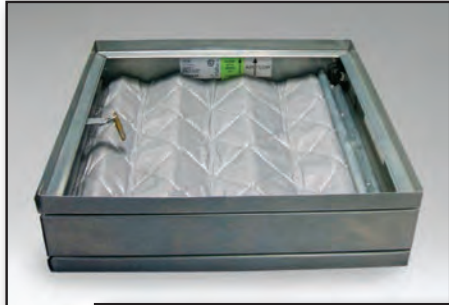
APPLICATION

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.

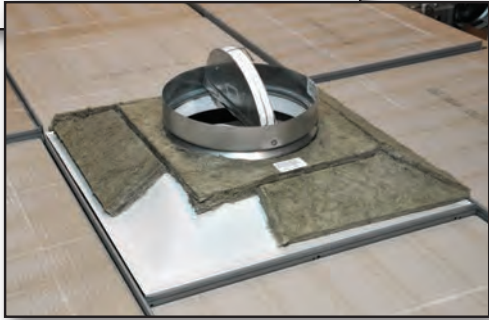
Conventional fire dampers, which stop the spread of flame but DO NOT stop heat, are unacceptable for protecting fire rated ceilings.



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



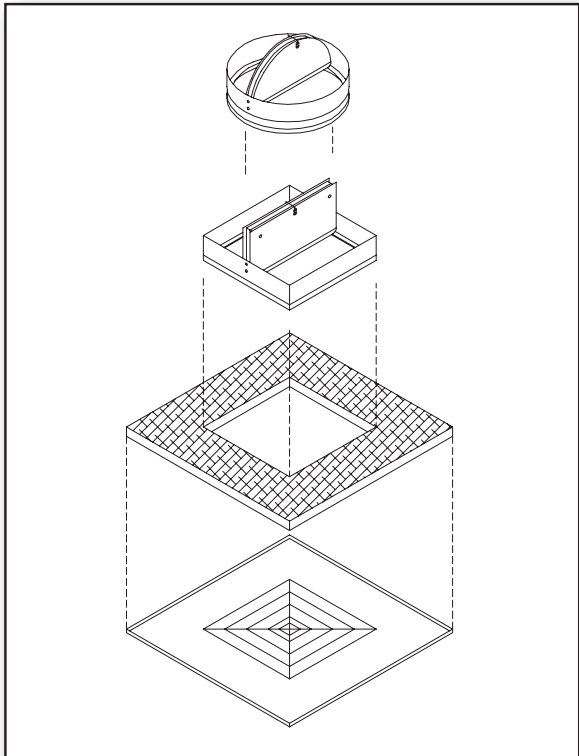
CFD5
For lay-in ceiling application



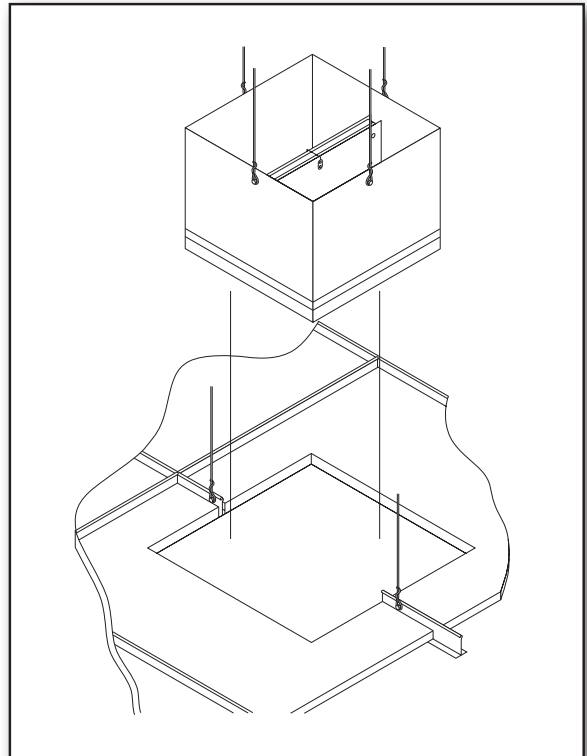
CFD(R)2, CFD(R)3
and CFD4 ceiling
fire damper
for surface mount



INSTALLATION



Lay-In



Surface Mount

CFD2, CFD3 and CFD4 CEILING FIRE DAMPERS

3 HOUR UL555C CLASSIFIED



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 with out 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.

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.

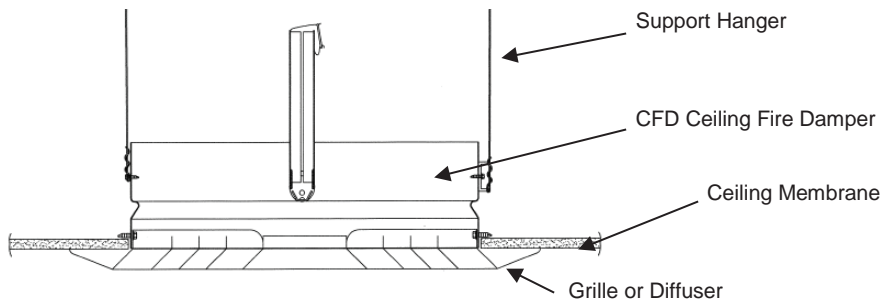
Standard 1 1/2 and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.



CFD



CFDR



SPECIFICATIONS		
Damper	Frame	Blades
All Models	Galvanized Steel (in gauges required by UL listing R8039)	Galvanized Steel, with UL Classified insulation as required (in gauges required by UL listing R8039)



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.

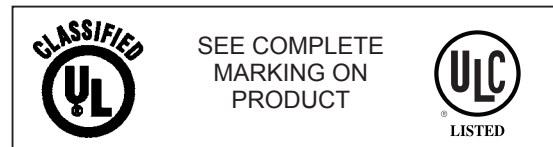
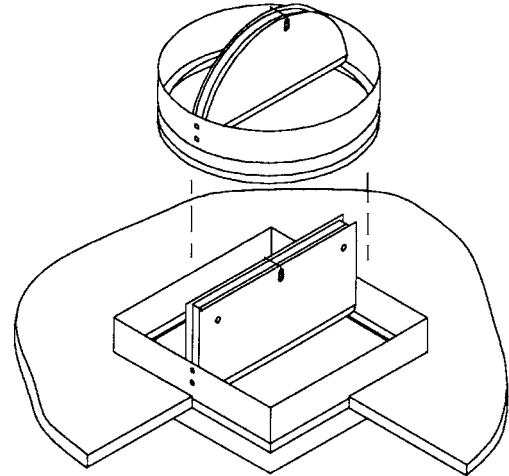
CEILING PENETRATIONS

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.



California State Fire Marshal Listing No. 3225-245:101

INSTALLATION 1

UNDUCTED OR FLEX DUCT 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 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 hanger 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).

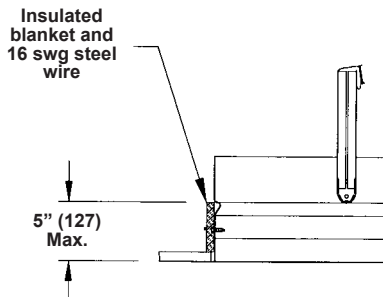
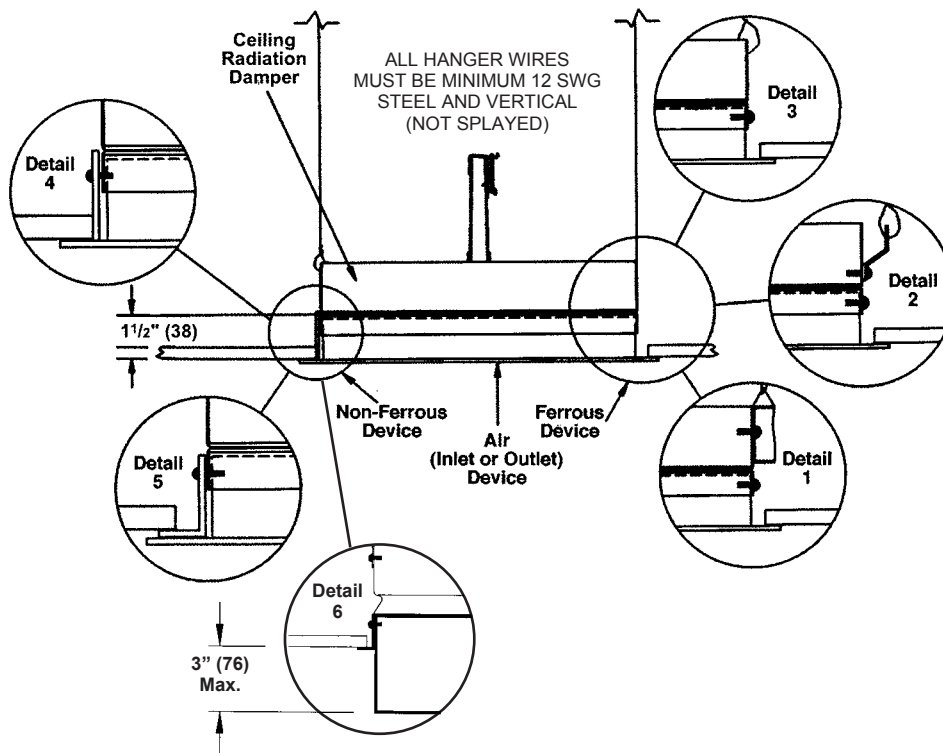
Non-Ferrous Air Devices

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 between 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

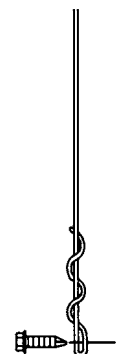
Penetrating the ceiling membrane may be accomplished by extending the damper frame or sleeve below the ceiling surface. Steel or flex duct may be attached to the damper/sleeve extension. (Rectangle steel duct may be attached with 'S'-Slip connectors and round steel duct to be attached with maximum of 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.



Hanger Wire Loop Detail

INSTALLATION 2

DUCTED SURFACE MOUNT SUPPORTED FROM DUCTWORK

- 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).

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.

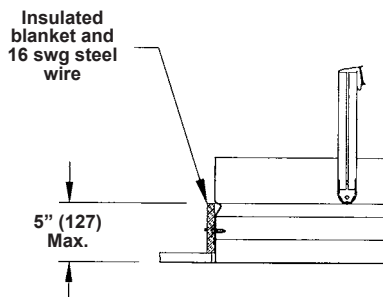
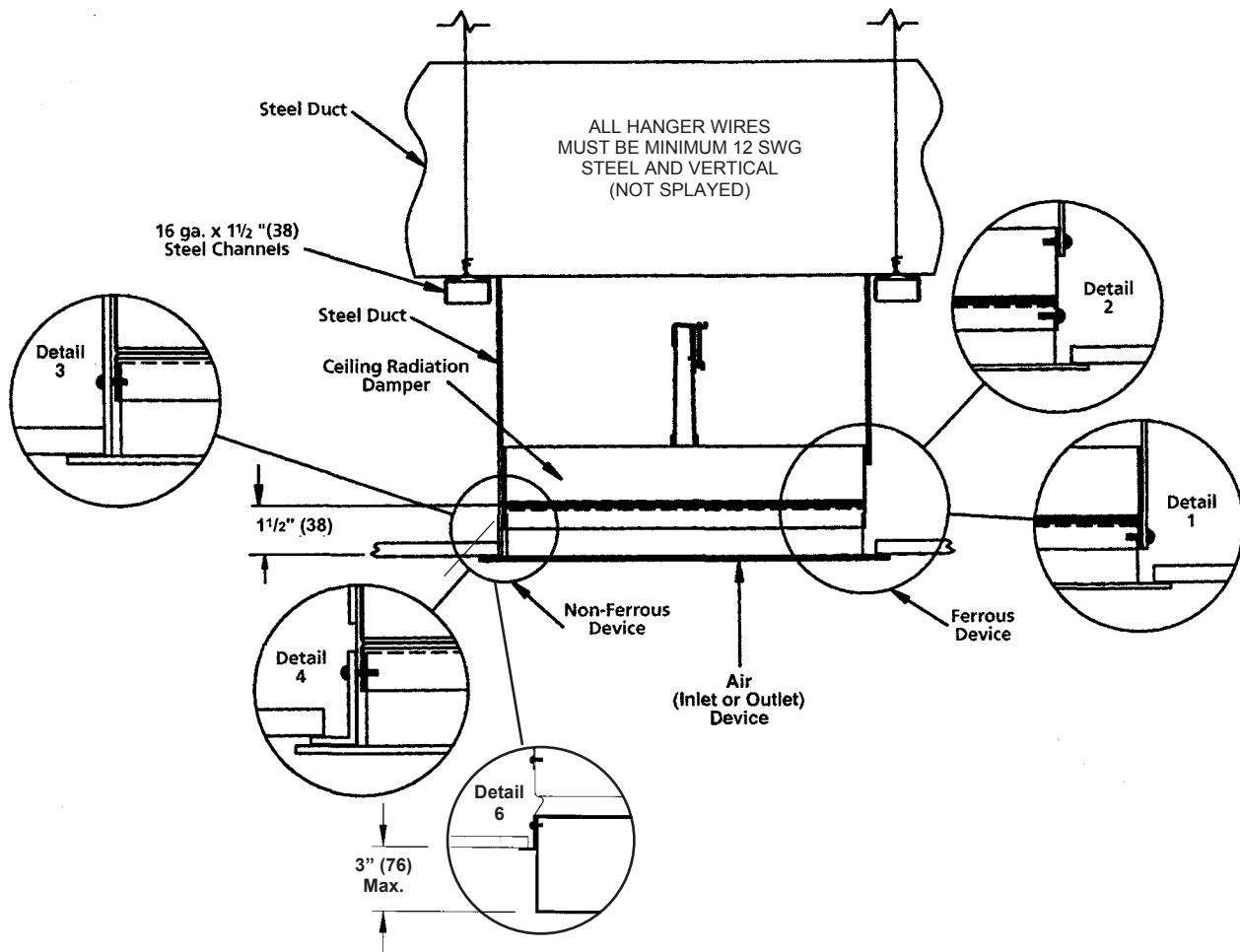
Non-Ferrous Air Devices

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:

Ceiling Membrane Penetration

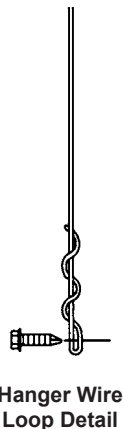
Penetrating the ceiling membrane may be accomplished by extending the damper frame or sleeve below the ceiling surface. Steel or flex duct may be attached to the damper/sleeve extension. (Rectangle steel duct may be attached with 'S'-Slip connectors and round steel duct to be attached with maximum of 3 - #8 sheet metal screws). A steel angle is required per note 2 above. (Detail 5)



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.



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:

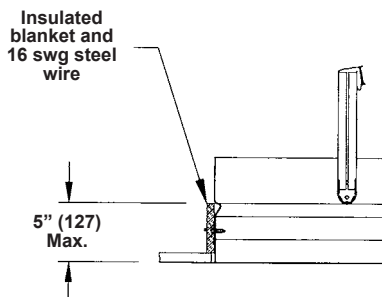
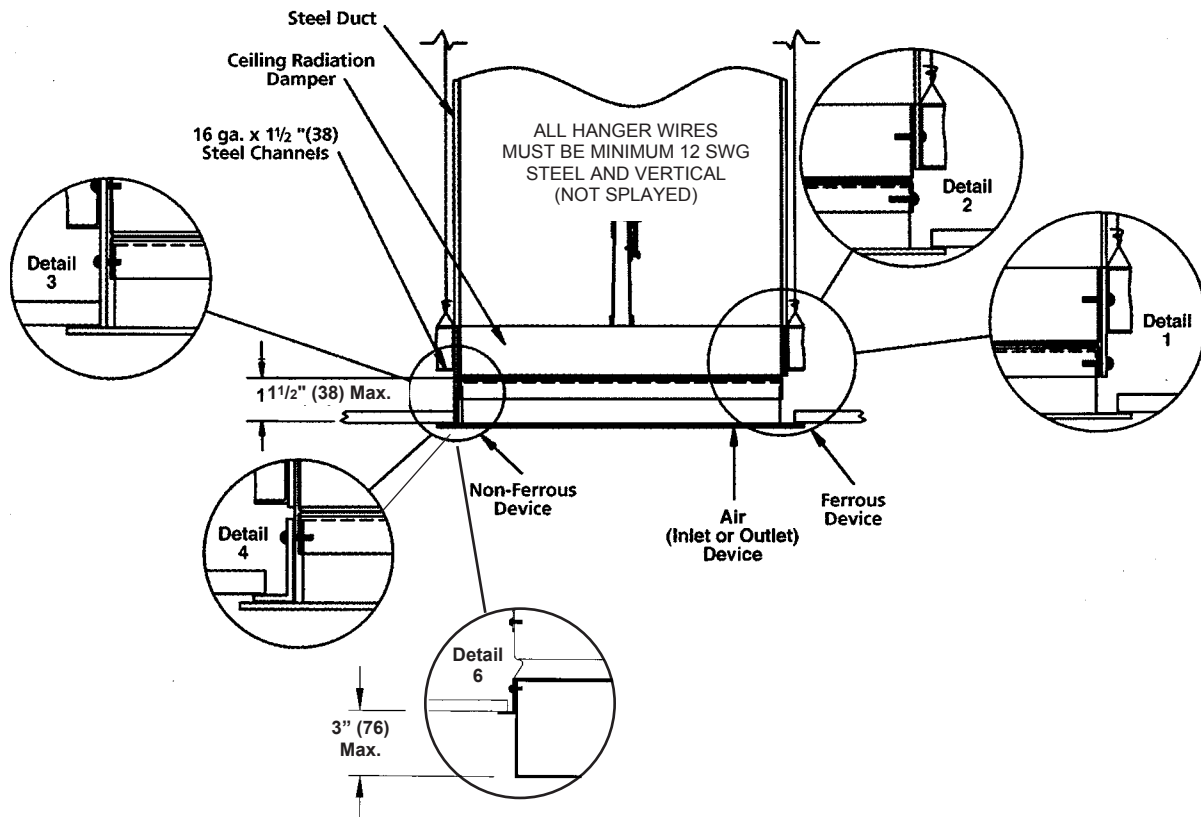
1. A steel duct drop should extend to the bottom surface of the ceiling membrane and the opening in the ceiling membrane

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). Note the steel angle may be installed on top or bottom of the ceiling membrane.

Ceiling Membrane Penetration

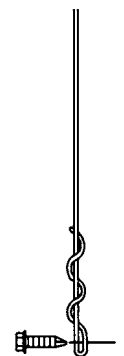
Penetrating the ceiling membrane may be accomplished by extending the damper frame or sleeve below the ceiling surface. Steel or flex duct may be attached to the damper/sleeve extension. (Rectangle steel duct may be attached with 'S'-Slip connectors and round steel duct to be attached with maximum of 3 - #8 sheet metal screws). A steel angle is required per note 2 above. (Detail 5)



IMPORTANT THERMAL BLANKET NOTE

This installation requires a thermal blanket if:

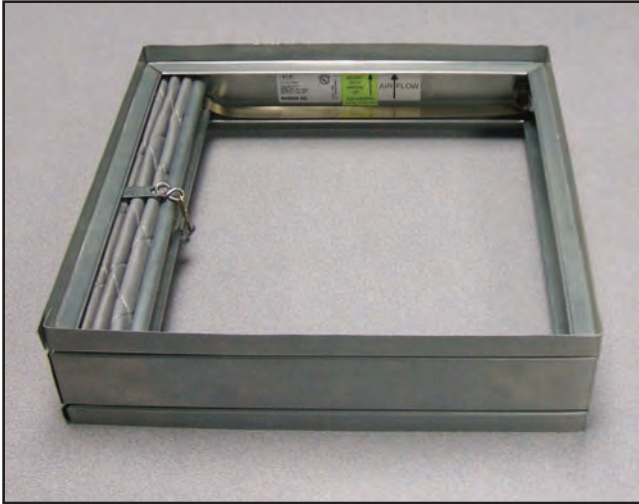
- The distance from the face of the ceiling to the bottom of the closed damper blades exceed 1 1/2" (38). In which case a thermal insulating blanket must wrap around the damper (from top of ceiling membrane to closed damper blades) and be retained by a 16 SWG steel wire (refer to installation 4). The 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.



Hanger Wire Loop Detail

CFD8 CURTAIN TYPE CEILING FIRE DAMPERS

3 HOUR UL555C CLASSIFIED



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 1/2 and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.

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.

SPECIFICATIONS

Damper	Frame	Blades	Closure Springs	Hourly Rating
CFD8	Galvanized Steel (in gauges required by UL listing R5531)	Non-asbestos ceramic fiber	301 stainless steel	3

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Single Section
CFD8	6"w x 6"h (152 x 152)	18"w x 18"h (457 x 457)

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INSTALLATION INSTRUCTIONS CEILING DAMPERS MODEL CFD8

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.

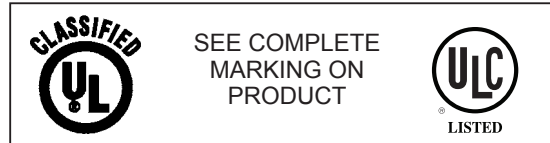
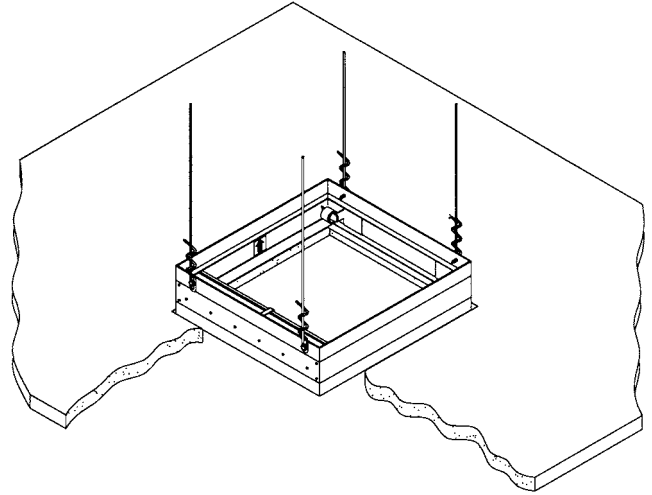
CEILING PENETRATIONS

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.



INSTALLATION 1

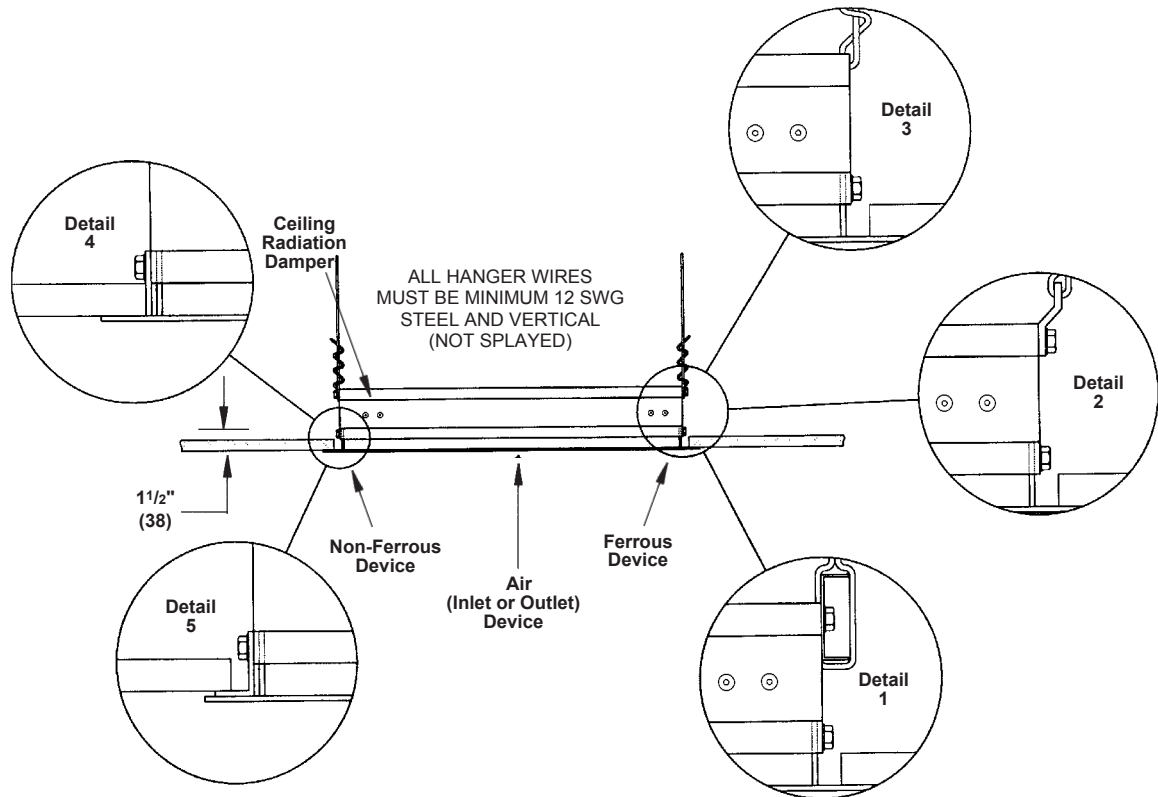
UNDUCTED OR FLEX DUCT SURFACE MOUNT SUPPORTED FROM STRUCTURE

- 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 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 hanger 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).



INSTALLATION 2
DUCTED SURFACE MOUNT SUPPORTED FROM DUCTWORK

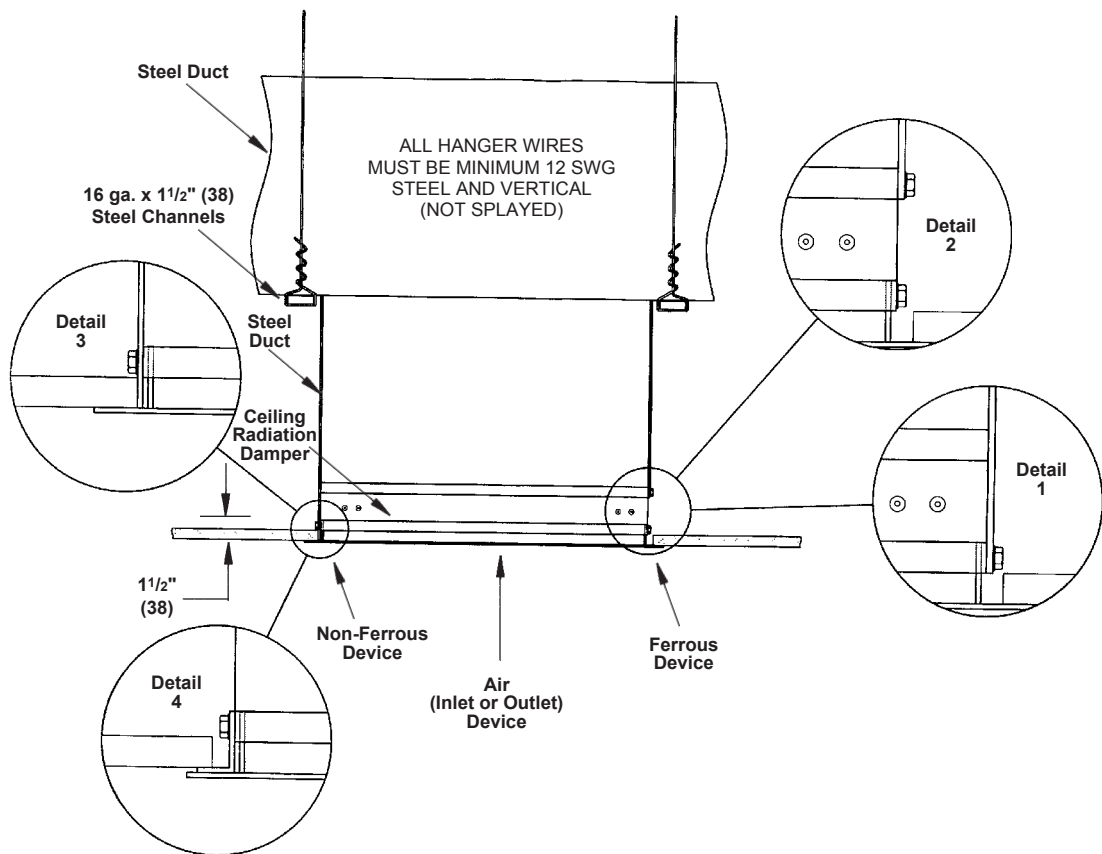
- Opening in ceiling membrane may be up to one inch larger than the nominal size of the ceiling radiation damper. For example a 12" x 12" (305 x 305) ceiling radiation damper could have a maximum ceiling membrane opening of 13" x 13" (330 x 330).
- Connection of ceiling radiation damper, grille and steel 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

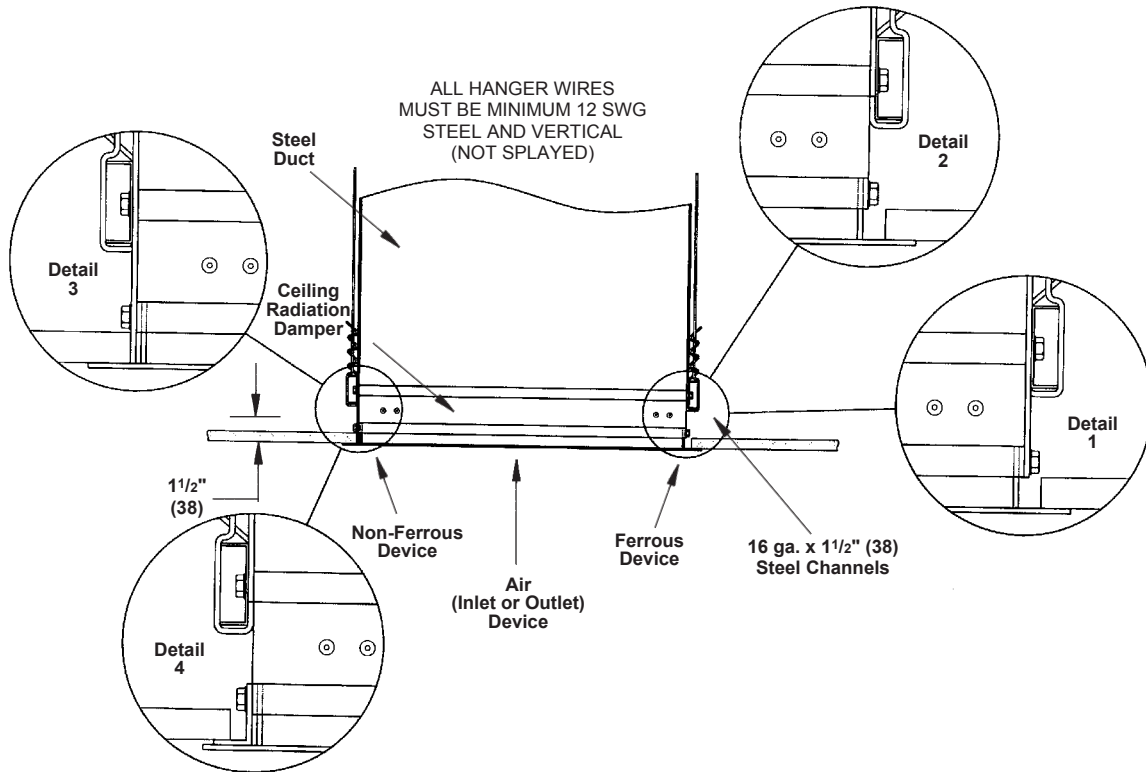
DUCTED SURFACE MOUNT SUPPORTED FROM STRUCTURE

- 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).

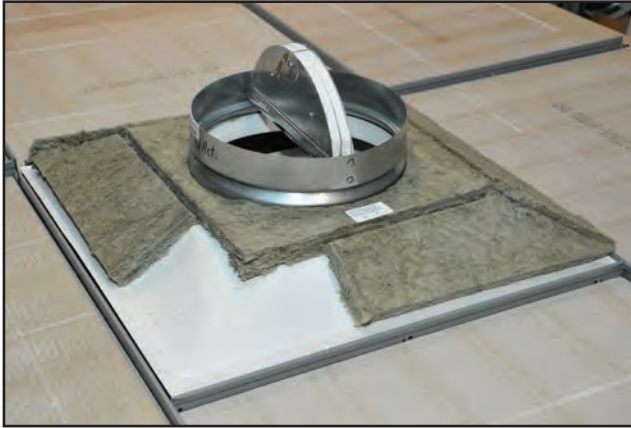


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CFD(R)5 CEILING FIRE DAMPERS

3 HOUR UL555C CLASSIFIED



CONSTRUCTION DETAILS

UL Classification testing for ceiling fire dampers measures the heat transmitted through, and temperatures above, ceiling penetrations with ceiling dampers.

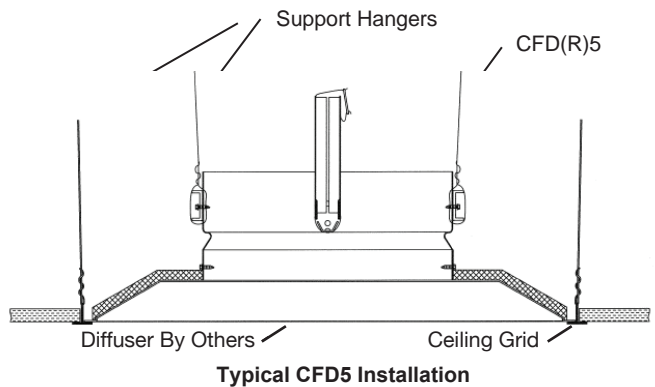
CFD5 Rectangular dampers are provided with blade insulation.

CFDR5 Round dampers are provided with blade insulation.

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 hours or less

Standard 1 1/2 and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.



SPECIFICATIONS				
Damper Models	Minimum Size	Maximum Size	Frame	Blades
CFD5	6" x 6" (152 x 152)	18" x 18" (457 x 457)	Galvanized Steel (in gauges required by UL listing R8039)	Galvanized Steel (in gauges required by UL listing R8039)
CFDR5	5" Dia. (127)	20" Dia. (508)		

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INSTALLATION INSTRUCTIONS CEILING FIRE DAMPERS MODELS CFD(R)5, CFD(R)5

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 $\frac{3}{8}$ " (10).

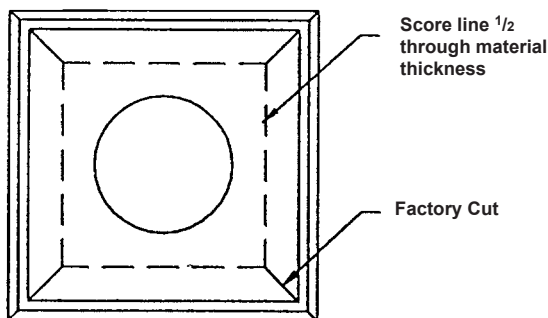
MINERAL WOOL THERMAL BLANKET

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 $\frac{3}{16}$ " (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, $\frac{3}{16}$ " (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

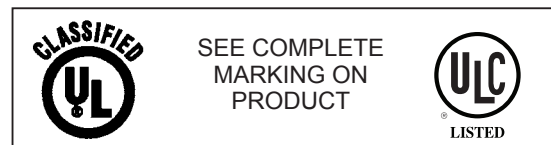
Flex Duct Connection: Flex duct connection shall be made with steel clamp; 16 SWG wire; or cable ties.

Steel Duct Connection: Fasten the damper to the steel duct with minimum of #8 sheet metal screws; $\frac{3}{16}$ " (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

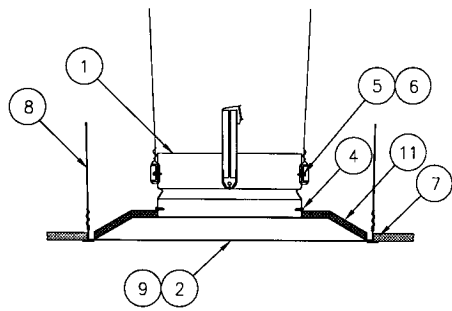
The duct can be supported by the damper and diffuser/grille assembly (refer to figure 2). Duct support is achieved by the use of minimum four 12 SWG hanging wires, looped around the ends of 16 MSG x $\frac{1}{2}$ " channels, attached to the damper by #10 sheet metal screws (refer to figure 2). The wires 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 $\frac{1}{2}$ " 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 hangers are not required in this application.



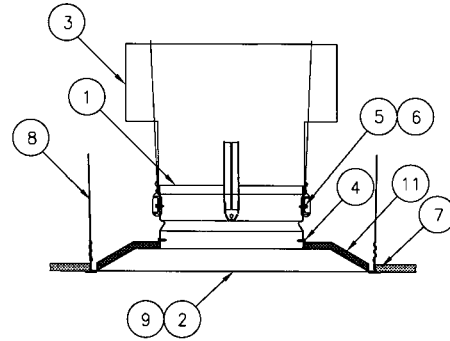
California State Fire Marshal Listing No. 3225-245:101

Figure 1



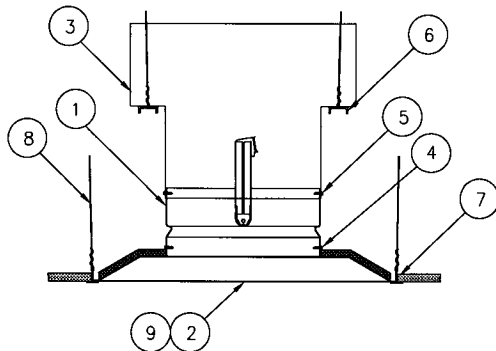
Ductless Application

Figure 2



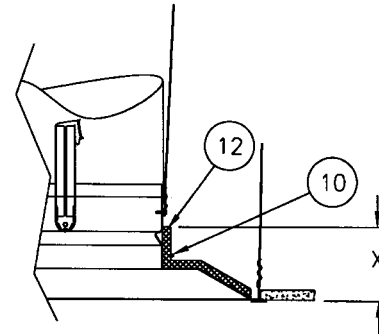
Duct Support by the Damper

Figure 3



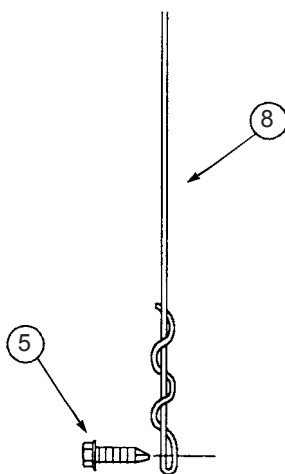
Damper Support by the Duct

Figure 4



Damper Height

Figure 5



Hanging Wire and Loop

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	Damper	8.	12 SWG Steel Wire
2.	Grille Frame (24 Ga. Min.)	9.	Diffuser or Grille Core (Metallic or Non-Metallic)
3.	Duct (where shown)	10.	16 SWG Steel Wire
4.	#8 Sheet Metal Screw	11.	Thermal Blanket Insulation
5.	#10 Sheet Metal Screw	12.	Insulation strips (Refractory Ceramic Fiber or Mineral Wool)
6.	16 MSG x 1 1/2" Channel		
7.	Ceiling (UL Classified)		

"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 2 3/4" (70) or smaller, insulation strips (Item 12) are not required.

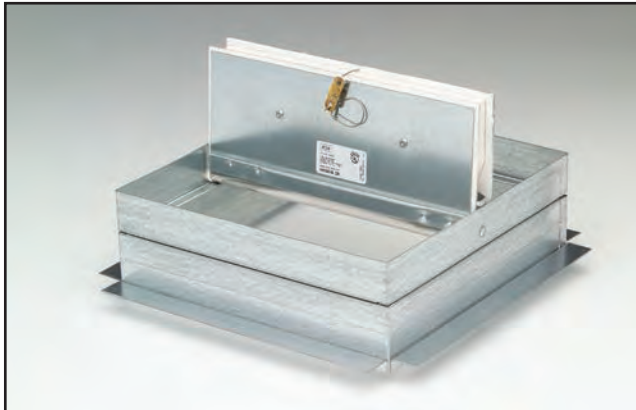
Insulating Strips are required when the "X" dimension exceeds the above dimensions but not greater than 5" (127). Wrap the 3" (76) wide insulation strips around the neck of the damper/diffuser and attach with 16 SWG minimum steel wire with the wire ends twisted tightly together. Steel clamps or cable ties are also acceptable.



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CFD(R)7T and CFD7 CEILING FIRE DAMPERS

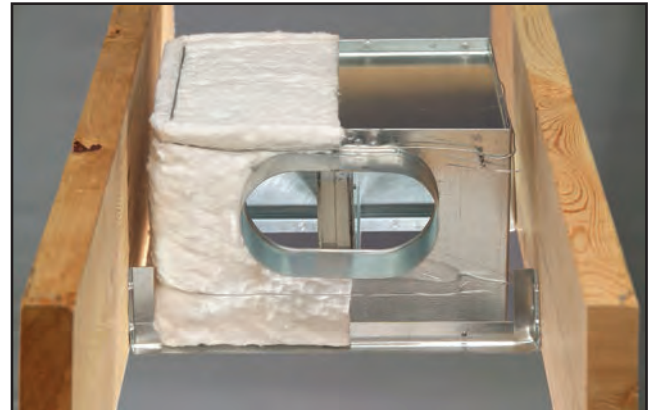
1 HOUR UL555C CLASSIFIED for WOOD CONSTRUCTION



CFD7T

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.

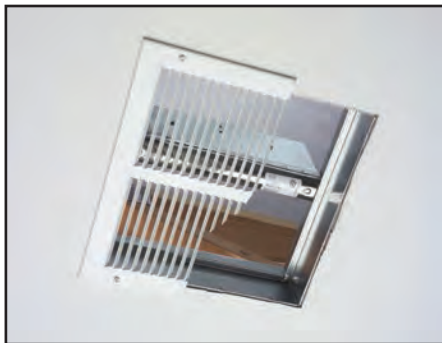


CFD7

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 3/4" (19).

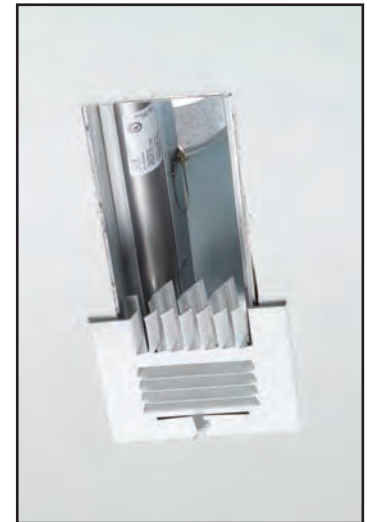
Standard 1 1/2 and 3 hour curtain and multiple blade fire dampers DO NOT provide the necessary protection.



CFD7 with Grille by others



CFD7T Through Penetration



CFD7T with Grille and OBD by others

SPECIFICATIONS				
Damper Models	Minimum Size	Maximum Size	Frame	Blades
CFD7	4" x 4" (102 x 102)	18" x 18" (457 x 457)	Galvanized Steel (In gauges required by UL listing R8039)	Galvanized Steel (In gauges required by UL listing R8039)
CFD7T	4" x 4" (102 x 102)	16" x 12" (406 x 305)		
CFDR7T	5" Dia.	18" Dia. (457)		



Click to Return to: [INDEX](#) [FSD](#) [SD](#) [IBD/DFD](#) [CFD](#)

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

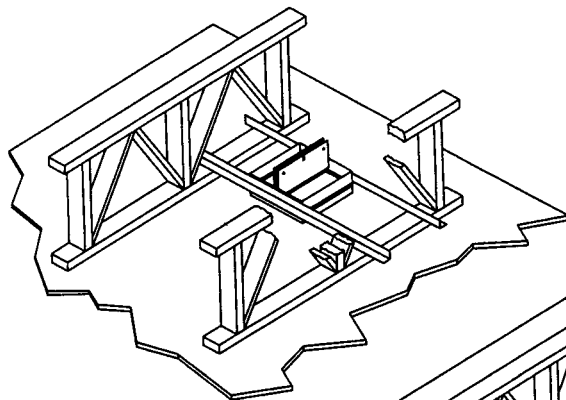
Support Angle to Damper: minimum of two #8 sheet metal screws, 3/16" (4) tubular rivets, tack or spot-welds per angle.

Support Angle to Truss: minimum of #8 x 3/4" long screw or #6 penny nail 1" long (25).

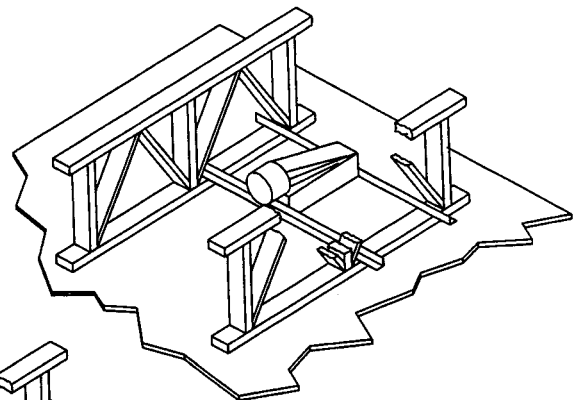
Grille/Diffuser frame to damper: minimum of two #8 x 1 1/4" (32) min. screws through the ceiling material and into the plaster flange or sub-frame.

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.

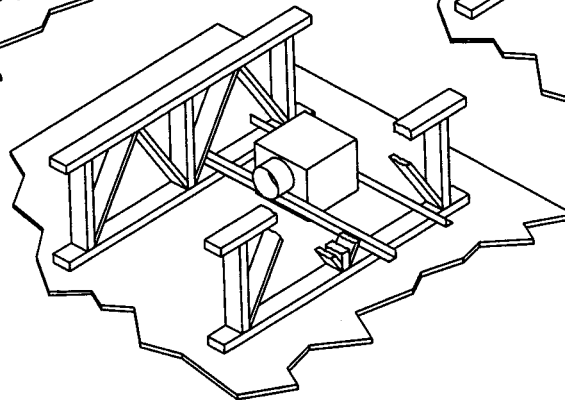
Make sure fasteners do not interfere with the damper operation.



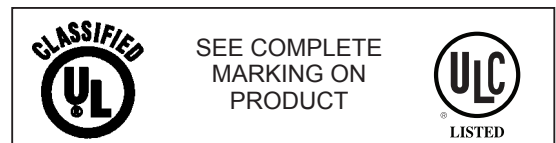
Unducted



Steel Boot

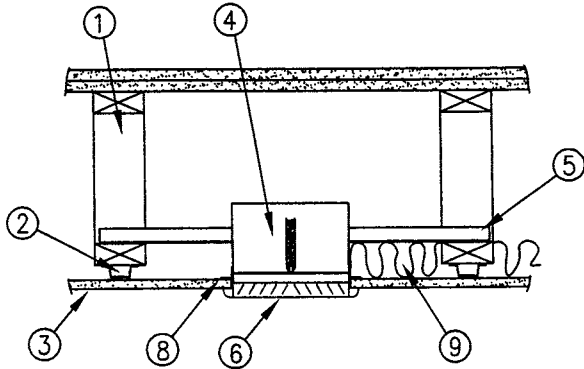


Steel or Ductboard
Plenum Box

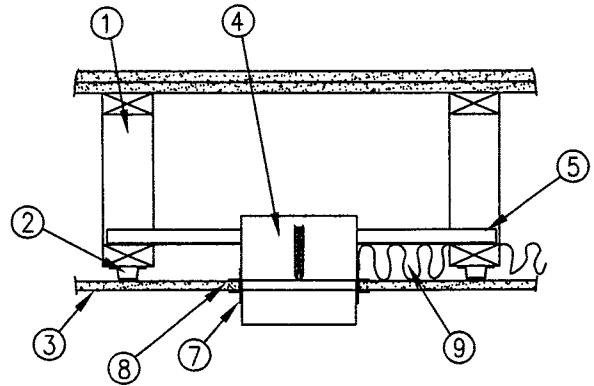


**INSTALLATION 1
UNDUCTED OR FLEX DUCT**

With Grille Diffuser

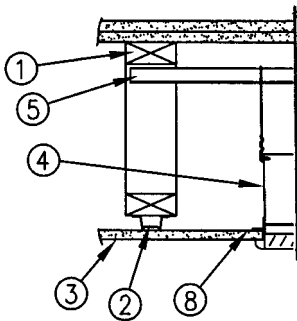


Through Ceiling Membrane Penetration



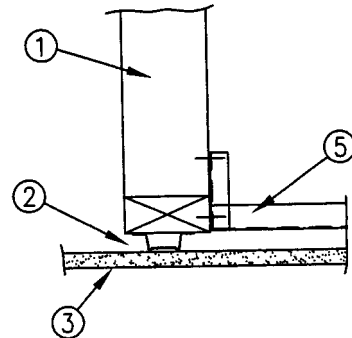
- | ITEM | DESCRIPTION |
|------|---|
| 1. | Wood Truss Assembly (Refer to UL Fire Resistance Directory) |
| 2. | RC Channel or Furring Channel or Steel Framing Members |
| 3. | UL rated gypsum wallboard (See UL design No.) |
| 4. | Ceiling Radiation Damper |
| 5. | 3/4" x 3/4" x 16ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x .85) Support Angle (2 sides) See Note 1 |

- | ITEM | DESCRIPTION |
|------|---|
| 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 DAMPER SUPPORT

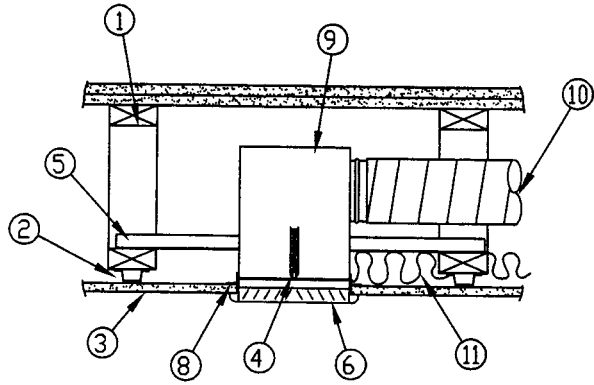
Damper support may be achieved by suspending the damper from support angles Item #5 or 2" x 4" (51 x 102) wood stud fastened to adjacent trusses and the damper suspended with four 18 swg steel wire or 3/4" x 3/4" x 26ga. (16 x 16 x .55) angle tabs spaced evenly around the damper.



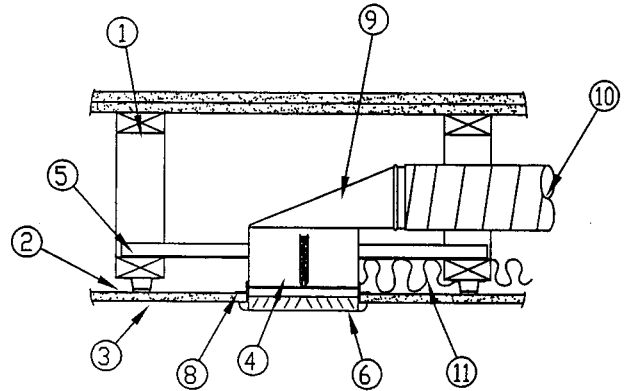
ALTERNATE SUPPORT ANGLE INSTALLATION

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.

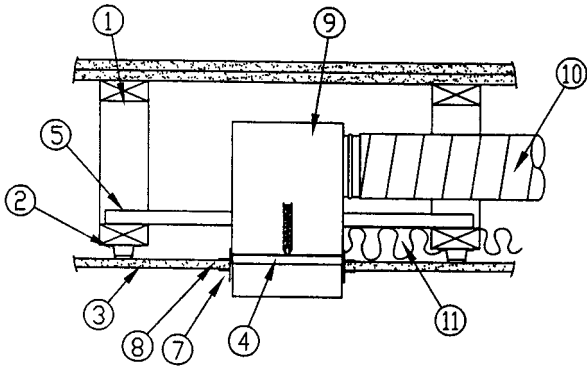
**INSTALLATION 2
With Steel Plenum Box**



**INSTALLATION 4
With Steel Boot**



**INSTALLATION 3
Through Ceiling Membrane Penetration and
Steel Plenum Box**



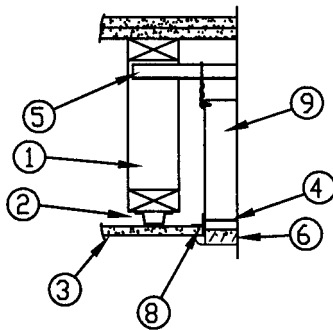
ITEM

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 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. Steel Plenum Box or Boot
10. Duct (optional)
11. Insulation (optional)

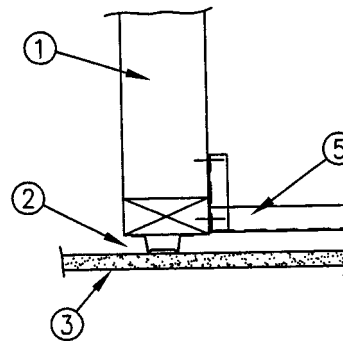
**ALTERNATE
DAMPER SUPPORT**

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.

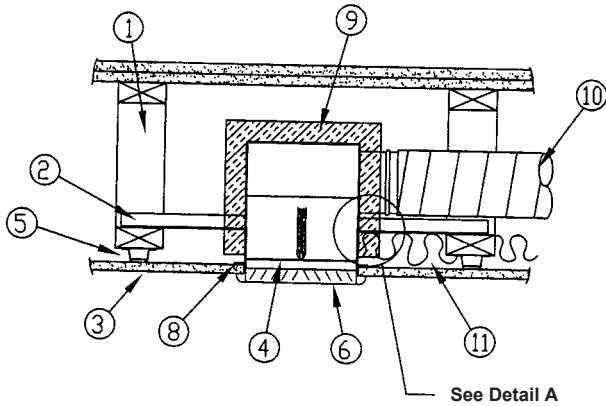


**ALTERNATE
SUPPORT ANGLE
INSTALLATION**

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.

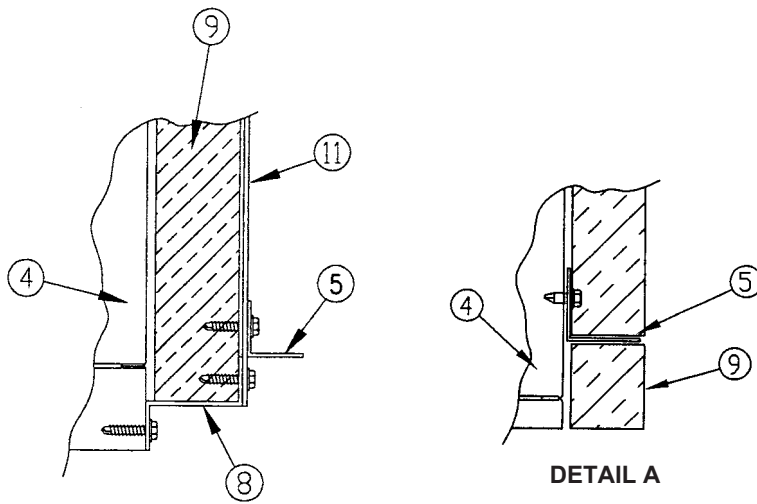
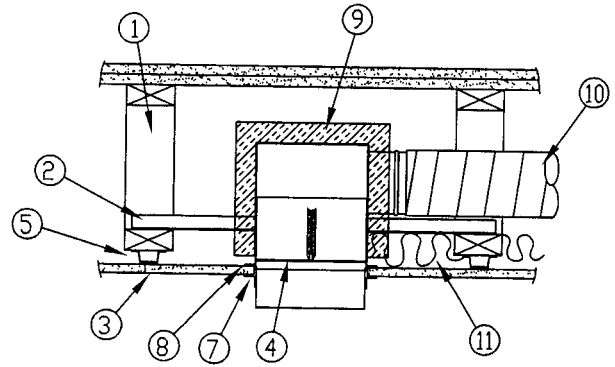


INSTALLATION 5
With Ductboard Plenum Box



See Detail A

INSTALLATION 6
Through Ceiling Membrane Penetration and Ductboard Plenum Box



DETAIL A

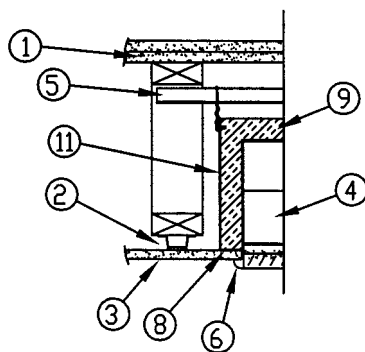
**SHEETMETAL WRAPPED
DUCTBOARD INSTALLATION**

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.

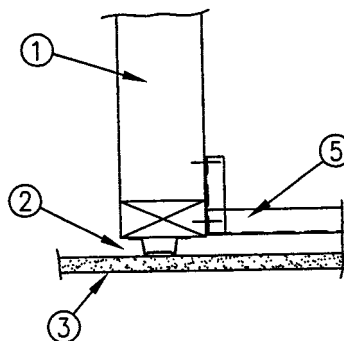
**ALTERNATE DAMPER
SUPPORT**

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.



RUSKIN®

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

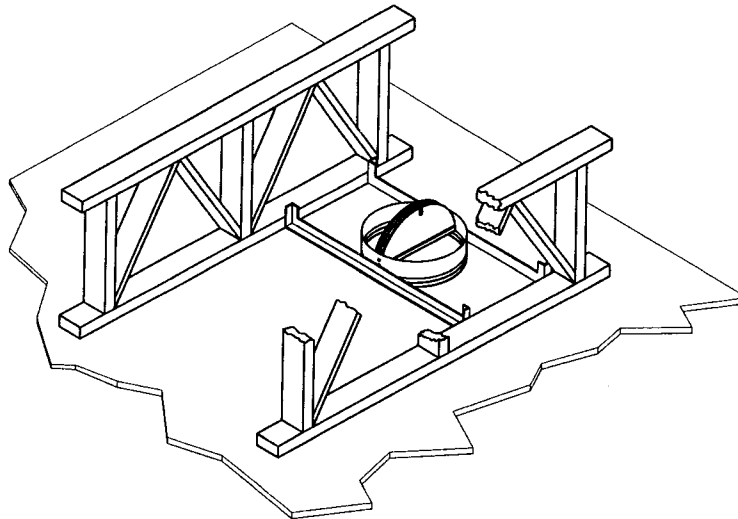
Support Angle to Damper: minimum of two #8 sheet metal screws, 3/16" (4) tubular rivets, tack or spot-welds per angle.

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.



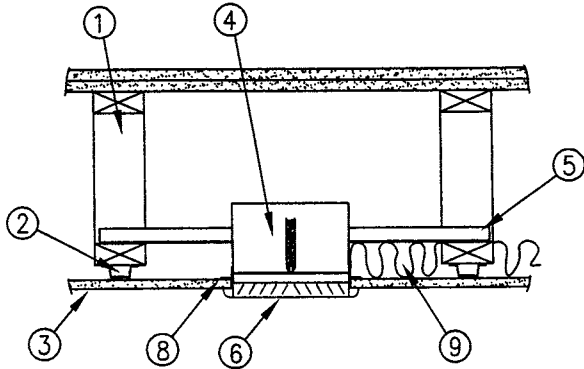
SEE COMPLETE
MARKING ON
PRODUCT



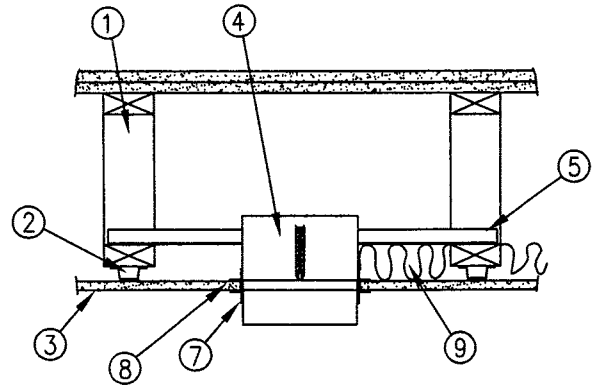
California State Fire Marshal Listing No. 3226-0245:0123

**INSTALLATION
UNDUCTED OR FLEX DUCT**

With Grille Diffuser

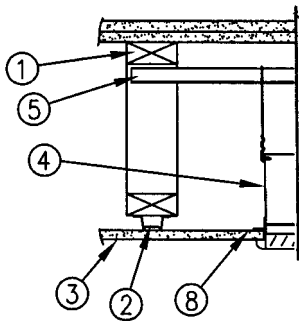


Through Ceiling Membrane Penetration



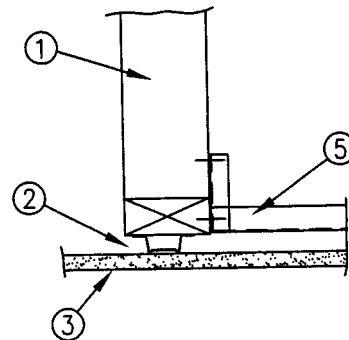
ITEM	DESCRIPTION
1.	Wood Truss Assembly (Refer to UL Fire Resistance Directory)
2.	RC Channel or Furring Channel or Steel Framing Members
3.	UL rated gypsum wallboard (See UL design No.)
4.	Ceiling Radiation Damper
5.	3/4" x 3/4" x 16ga. (19 x 19 x 1.61) or 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x .85) Support Angle (2 sides) See Note 1

ITEM	DESCRIPTION
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 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.



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www.ruskin.com

INSTALLATION INSTRUCTIONS CEILING FIRE DAMPERS MODEL CFD7

APPLICATION

Ceiling fire dampers maintain the integrity of the fire resistive ceiling assembly. The floor/ceiling and roof/ceiling designs are illustrated in the current UL Fire Resistance Directory. These installation instructions depict a ceiling fire damper installed in ceiling design L-501, L-502, L-503, L-506, L-507, L-508, L-512, L-513, L-514, L-515, L-516, L-517, L-519, L-522, L-523, L-524, L-533, L-537, L-545 and M-525.

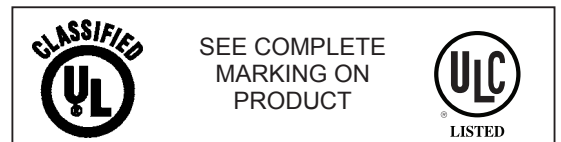
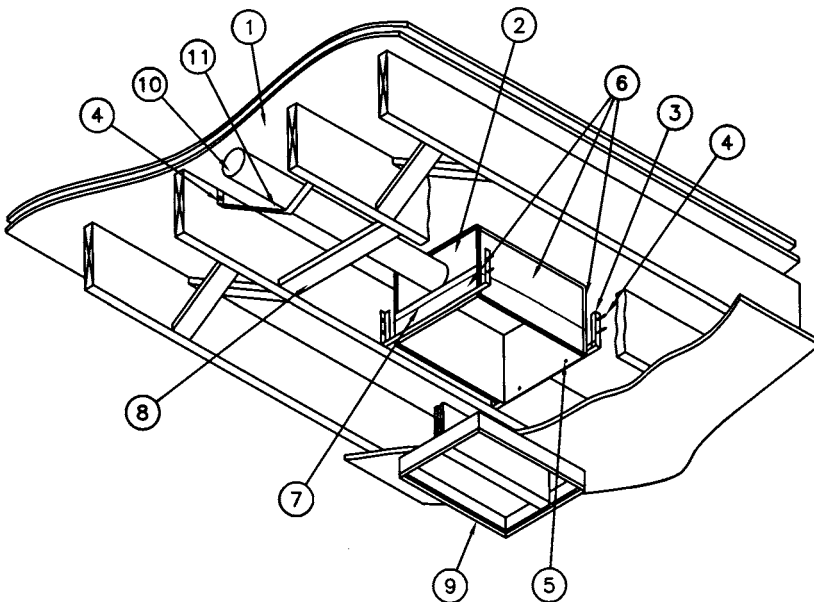
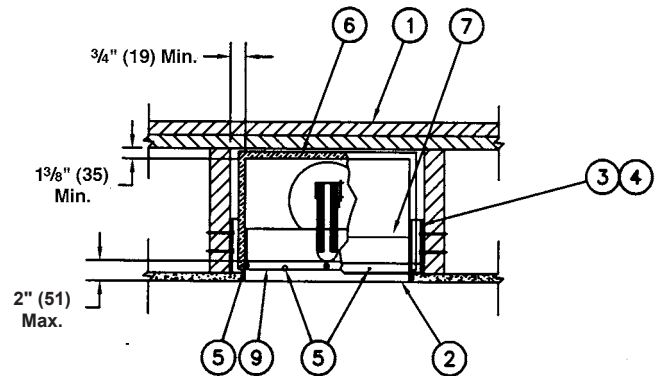
ITEM	DESCRIPTION
1.	Floor - Ceiling UL rated (See application section for design number).
2.	Steel box minimum of 24 gauge.
3.	3/4" x 3/4" 20 gauge Mounting Angle
4.	#6 Nail or #8 Wood Screw
5.	#8 Sheet metal Screw or Rivet
6.	1/2" thick Thermal Blanket (all sides)
7.	16 SWG Steel wire, Steel Clamp or Nylon Zip Tie
8.	2" x 4" Wood Brace
9.	Damper Assembly
10.	Duct (if required)
11.	24 gauge 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 O. Steel duct minimum 28 (.50) gauge and maximum of 20 (.9) gauge.
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 - 3/4" x 3/4" (19 x 19) angle bent into a channel and attached to the joist with a minimum of (2) #6 nails.

Installation

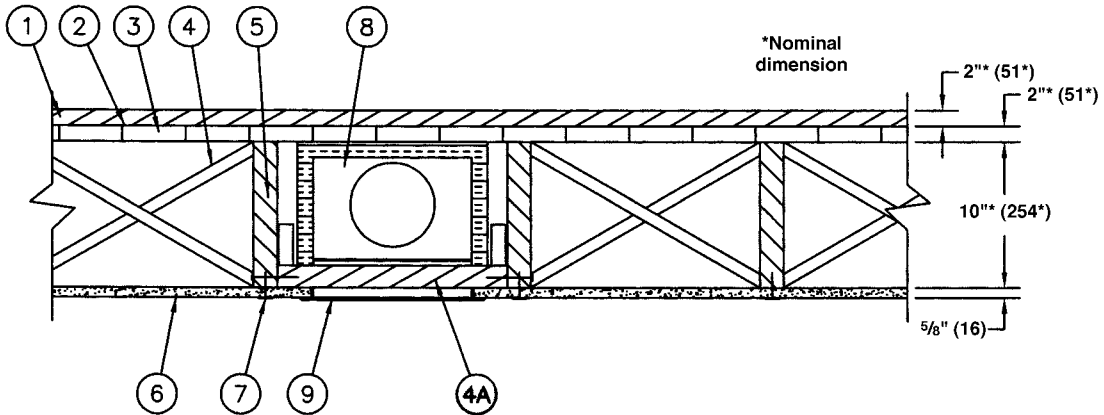
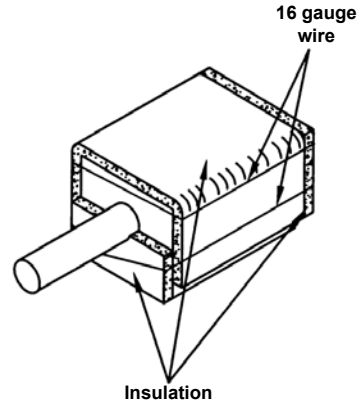
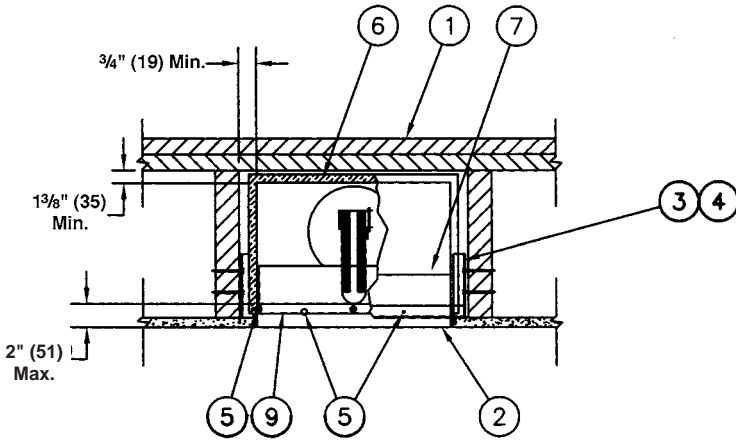
1. Attach the damper to the mounting angles with minimum of #8 sheet metal screw or 3/16" (4.5) dia. rivet. Minimum 2 per angle and maximum of 2" (51) from edge to damper.
2. The damper assembly is to be attached to the wood joist by the 2 - 3/4" x 3/4" (19 x 19) angle bent into a channel and fastened to the joist with a minimum of (2) #6 nails per side.
3. Wrap the damper assembly with 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.

ITEM DESCRIPTION

- | ITEM | DESCRIPTION |
|------|--------------------|
| 1. | Finish Flooring |
| 2. | Vapor Barrier |
| 3. | Sub Flooring |
| 4. | Cross Bridging |
| 4A. | 2" x 4" wood Brace |
| 5. | Wood Joist |
| 6. | Gypsum Board |
| 7. | Finishing System |
| 8. | Damper Assembly |
| 9. | Metallic Grille |



OPTIONAL FIELD INSTALLED SLEEVE

Damper Sleeve and End Cap

Sleeve thickness to be minimum of 24 gauge (.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.

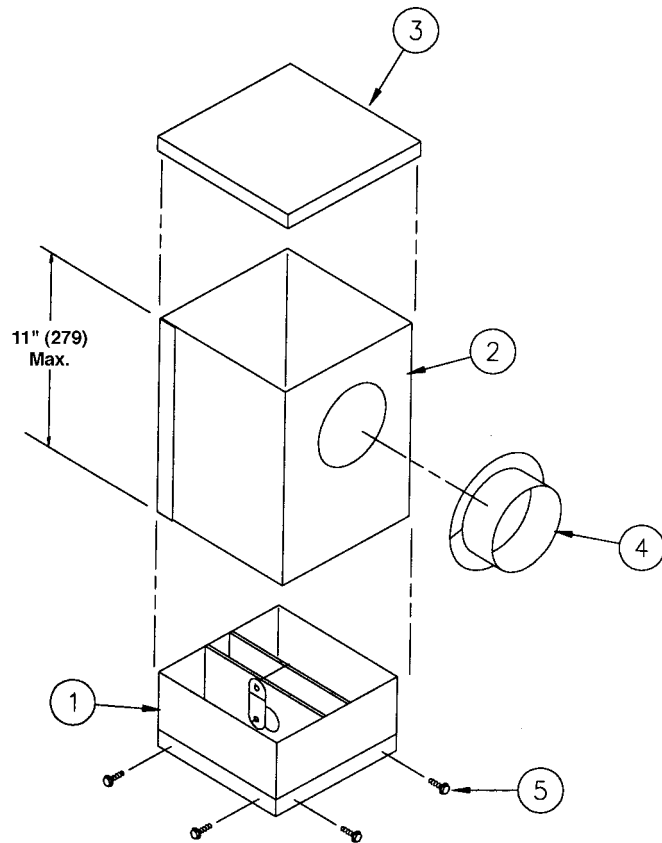
Fastener Spacing

Fasten the sleeve to the CFD7 with minimum of 2 bolts, screw, rivets or welds per side.

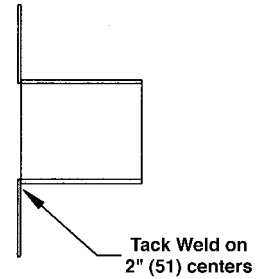
ITEM DESCRIPTION

1. CFD7 Ceiling Fire Damper
2. Sleeve 24 ga. (.7) minimum
3. End Cap 24 ga. (.7) minimum
4. Collar
5. Fasteners

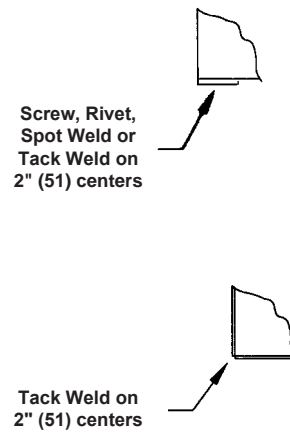
Note: CFD7 are shipped with 1/2" (13) thick thermal blanket for field installation.



Optional Branch Connection



Optional Sleeve and End Cap Seams



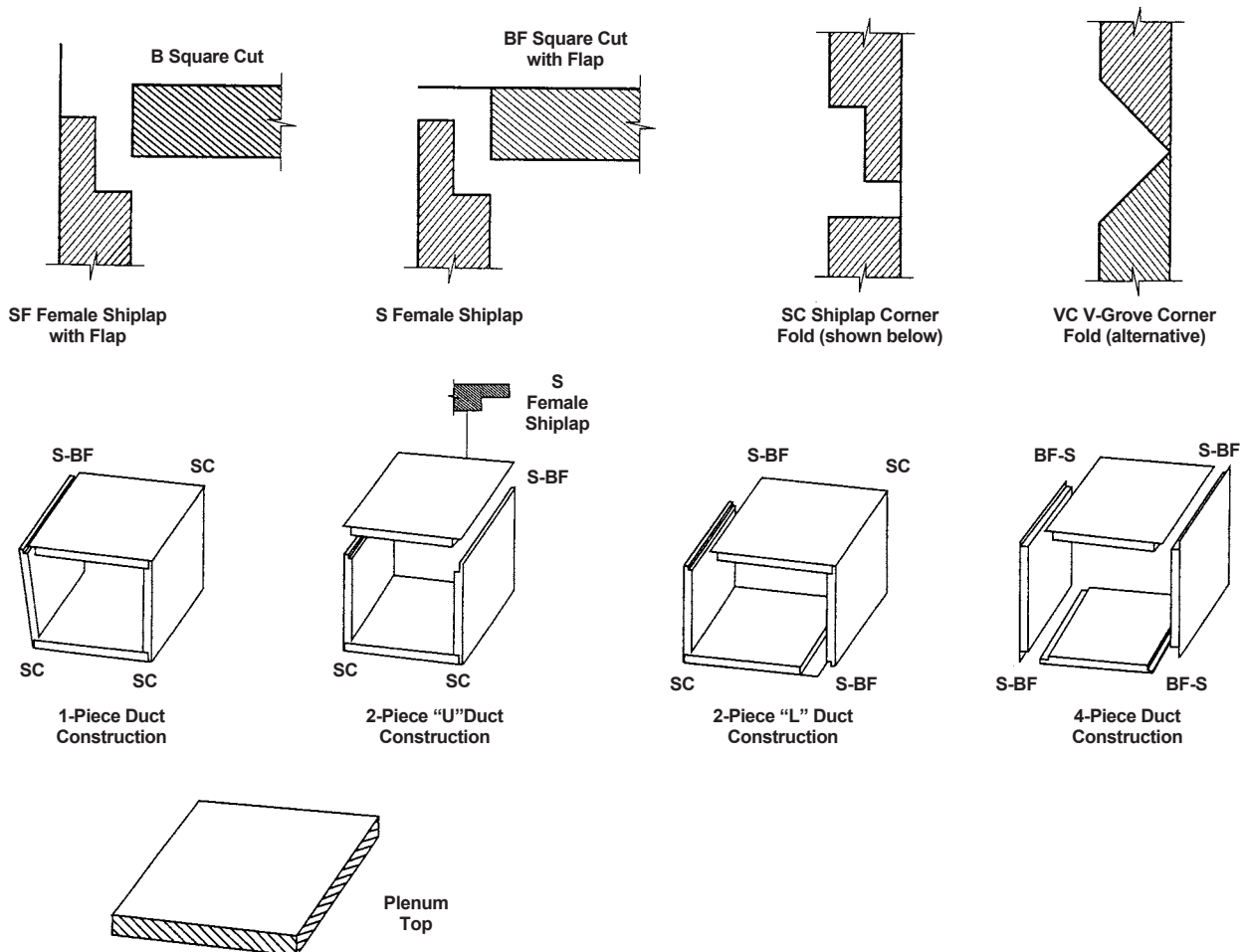
FIBERGLASS DUCTBOARD PLENUM FOR CEILING DAMPERS INSTALLATION INSTRUCTION SUPPLEMENT

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 gauge 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.



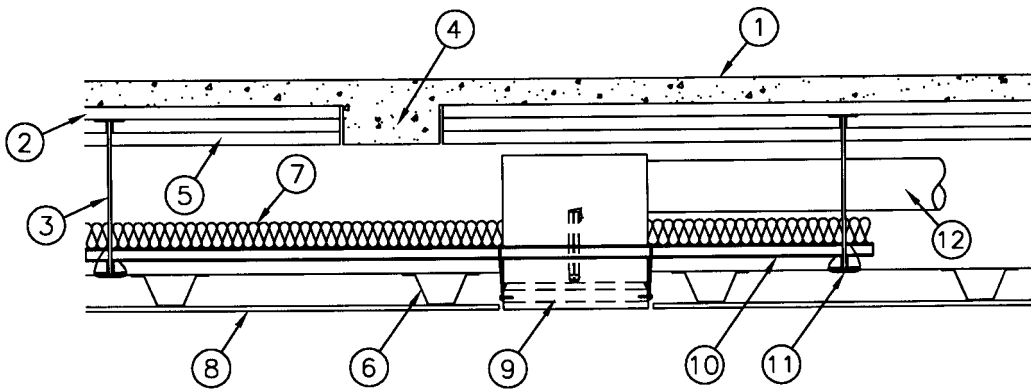
CFD7 INSTALLATION SUPPLEMENT FOR CEILING DESIGN G548

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.

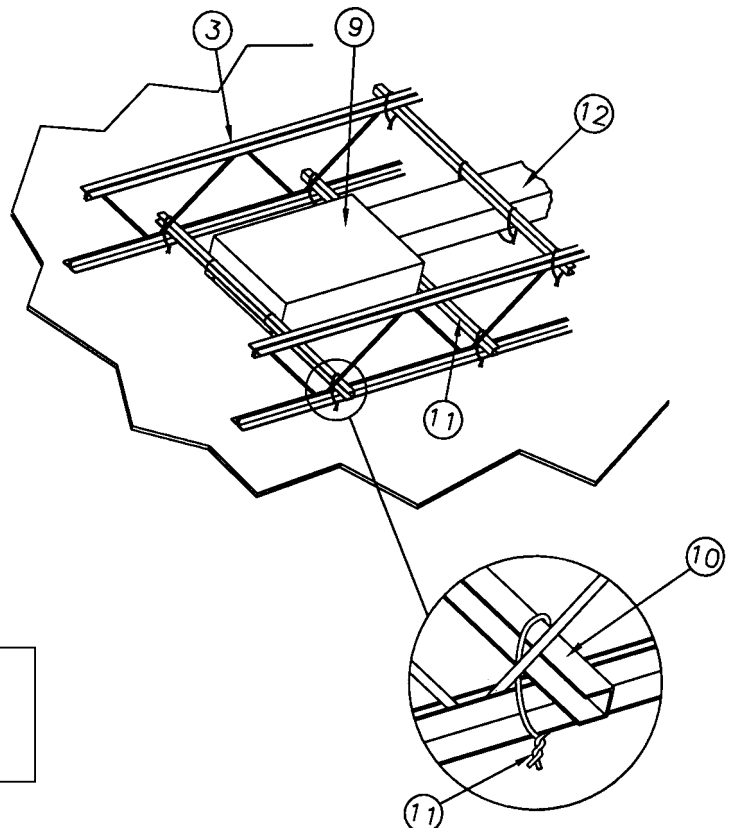
Notes:

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 |



Channel Support Detail



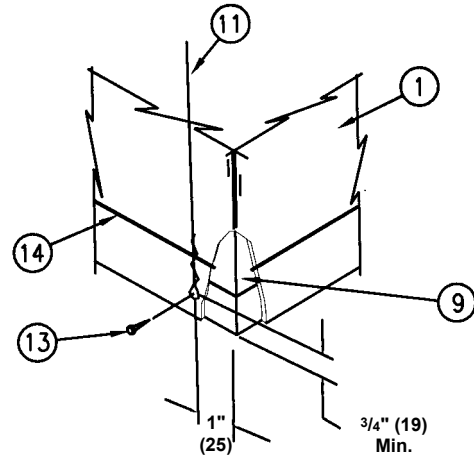
SEE COMPLETE MARKING
ON PRODUCT

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).

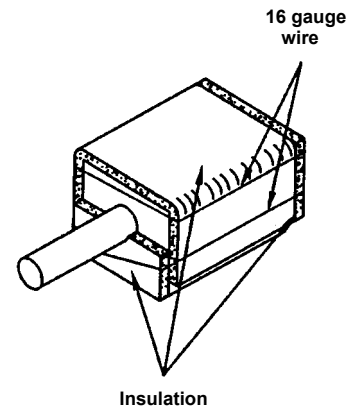
Note:

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.



Damper Support Detail

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.	1/2" (13) thick Thermal Blanket



Installation Detail

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CFD7 INSTALLATION SUPPLEMENT FOR CEILING DESIGN L524

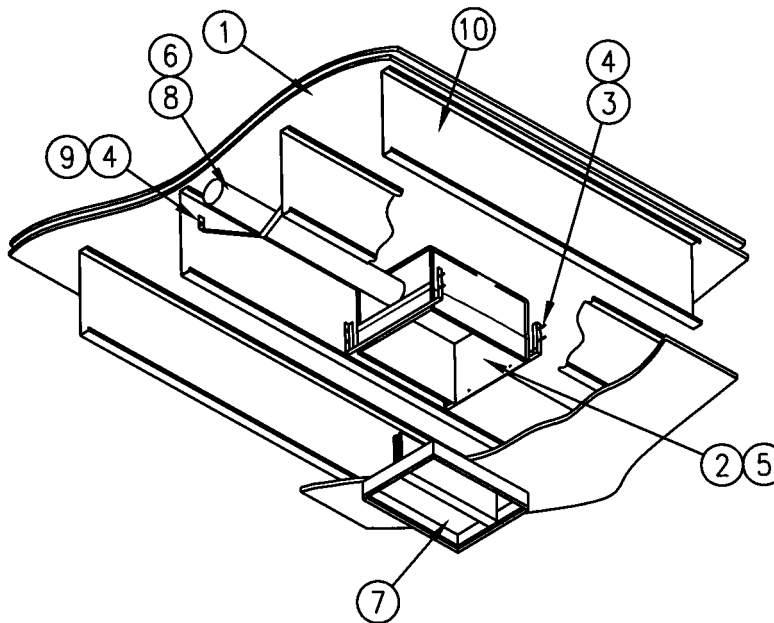
APPLICATION

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.

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.

ITEM	DESCRIPTION
1.	Floor or roof assembly
2.	Steel box minimum 24 gauge.
3.	3/4" x 3/4" 20 gauge 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 gauge x 1" wide duct support on 24" centers
10.	Steel joist



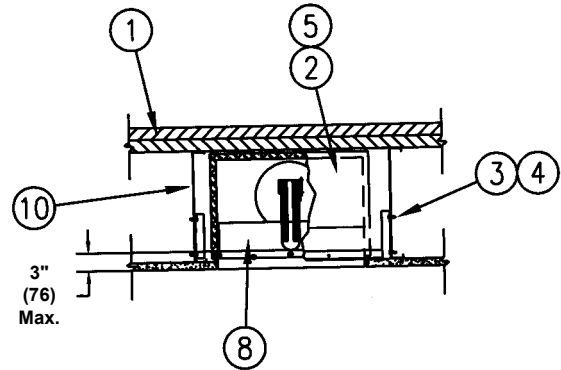
SEE COMPLETE MARKING
ON PRODUCT

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).

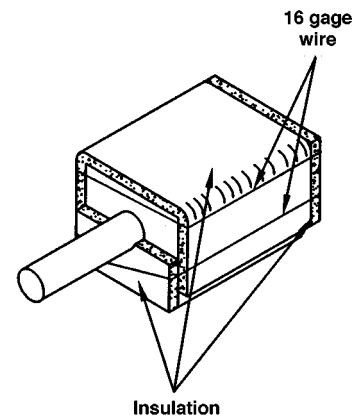
Note:

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 gauge. |
| 3. | 3/4" x 3/4" 20 gauge 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 gauge x 1" wide duct support on 24" centers |
| 10. | Steel joist |



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CFD2W and CFD3W CEILING FIRE DAMPERS

WARNOCK HERSEY CLASSIFIED RADIATION 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 at the ceiling membrane.

CONSTRUCTION DETAIL

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.

CFD3W Rectangular dampers with area up to 70 square inches (452) meet UL criteria without blade insulation.

CFD2W Rectangular dampers with area above 70 square inches (452) to 324 square inches (2090) are provided with blade insulation.

CFDR3W Round dampers 10" (254) diameter and under meet UL criteria without blade insulation.

CFDR2W Round dampers above 10" (254) diameter through 20" (508) diameter are provided with blade insulation.



CFD



CFDR

SPECIFICATIONS

Damper	Frame	Blades
All Models	Galvanized Steel	Galvanized Steel

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WARNOCK HERSEY INSTALLATION INSTRUCTIONS CEILING DAMPERS MODELS CFD(R)2W, CFD(R)3W, CFD(R)3.5W, CFD4W

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.



California State Fire Marshal
Listing No. 3225-245:101

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.

FIGURE 1

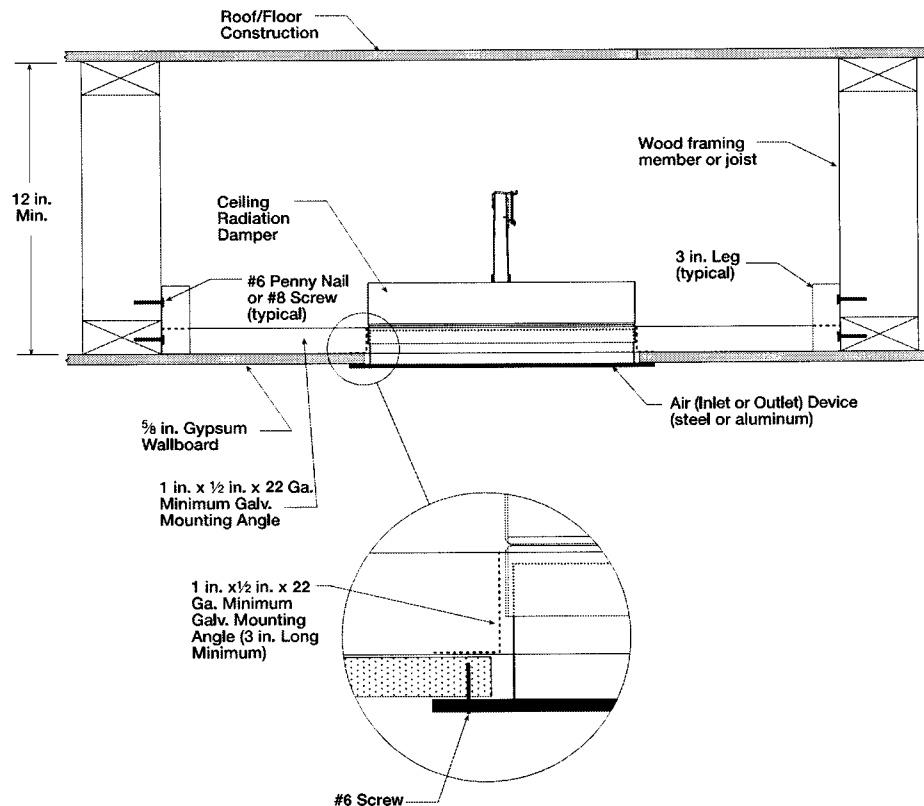


FIGURE 2

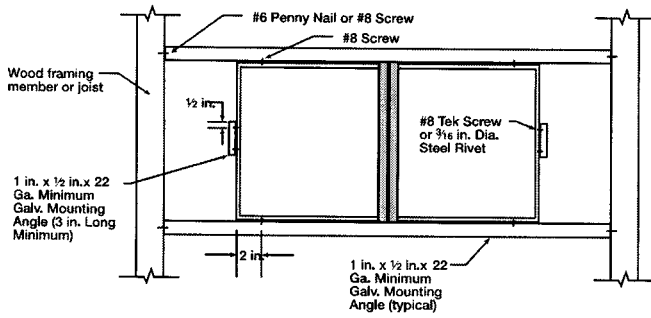


FIGURE 3

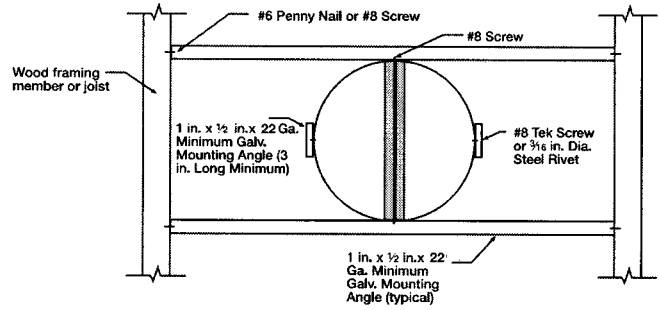
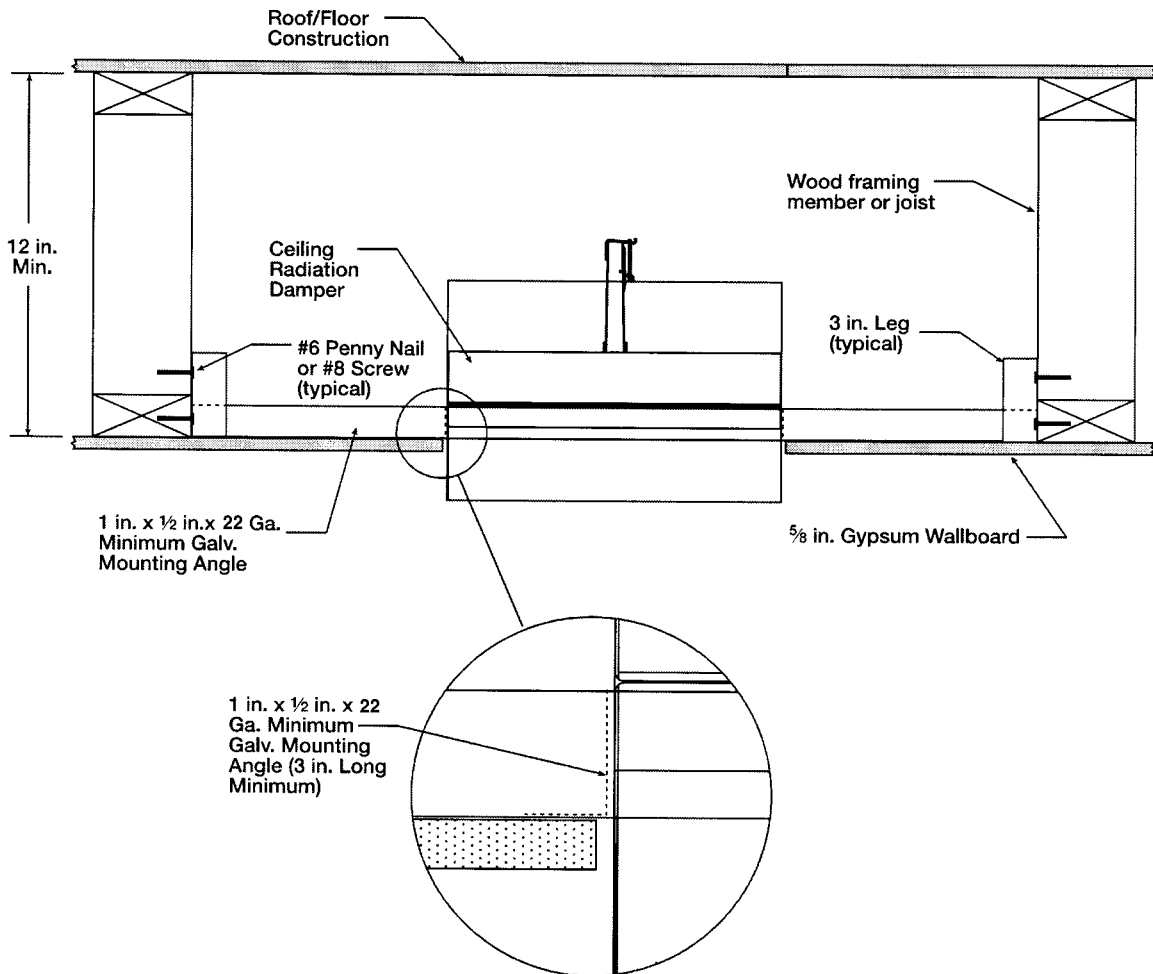
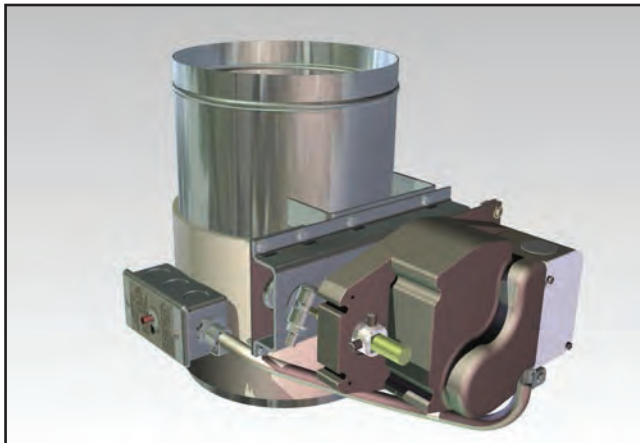


FIGURE 4



DFSDR1 Motorized Ceiling Fire Dampers And Class 1 Leakage Rated Corridor Damper

1 HOUR UL555C CLASSIFIED



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 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

Damper	Frame	Blades	Bearings	Blade Seal
DFSDR1	20 gauge (1.0) galvanized steel 12" (305) long	Two-piece 14 gauge (1.9) equivalent thickness galvanized steel.	Stainless steel sleeve type, pressed into frame	Silicone edge type sandwiched between two piece blades. Full circumference smoke seal to 450°F (232°C).

MAXIMUM UL CLASSIFIED DAMPER SIZES

Damper	Minimum Size	Maximum Size
DFSDR1	6" Dia. (152)	12" Dia. (305)

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INSTALLATION INSTRUCTIONS

MODEL DFSDR1 ROUND CORRIDOR FIRE/SMOKE AND CEILING DAMPER

1 HOUR UL555, 1 HOUR UL555C, UL555S CLASS 1 CLASSIFIED RATING

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 5/8" (16) gypsum will be attached to the studs with 1 1/8" (29) 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 gauge (.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

(DFSDR1 used as Corridor Damper)

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 gauge (.9) sleeve is integral to the damper and shall be equal to or heavier than the gauge 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 1 1/2" (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, 3/16" (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 gauge (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 gauge 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

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 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.

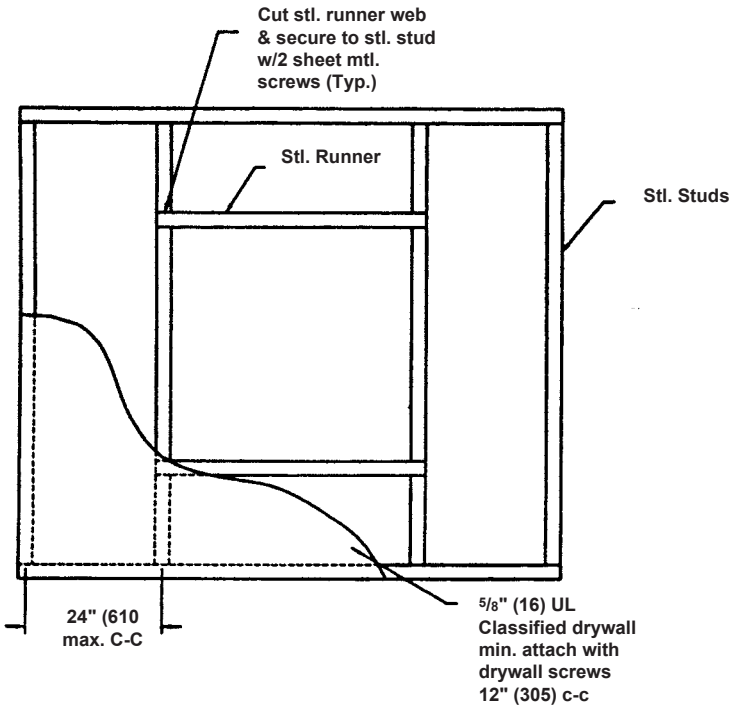
INSTALLATION SUPPLEMENTS

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

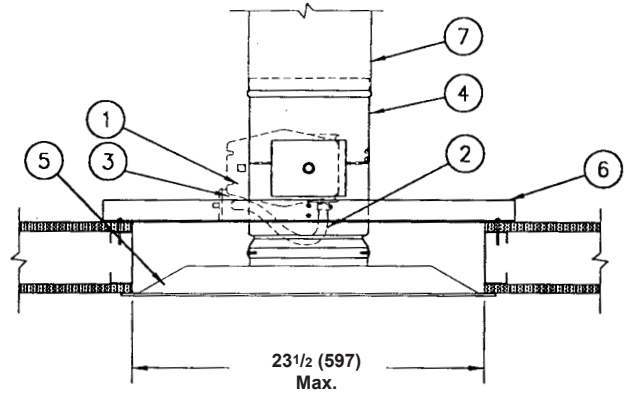
- Motor Operated TS150 FireState System with High Limit Temperature Sensor
- Motor Operated EFL Electric Resettable Link
- PFL Pneumatic Fuse Link
- SP100 on Fire and Leakage Rated Dampers

CORRIDOR INSTALLATION

STEEL STUD CONSTRUCTION



- | 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) |



FLOOR-CEILING/ROOF-CEILING INSTALLATION

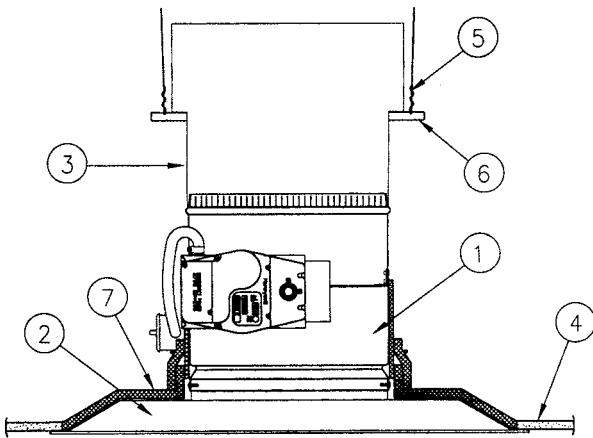


FIGURE 1
Fire Rated Ceiling with Steel Duct Drop

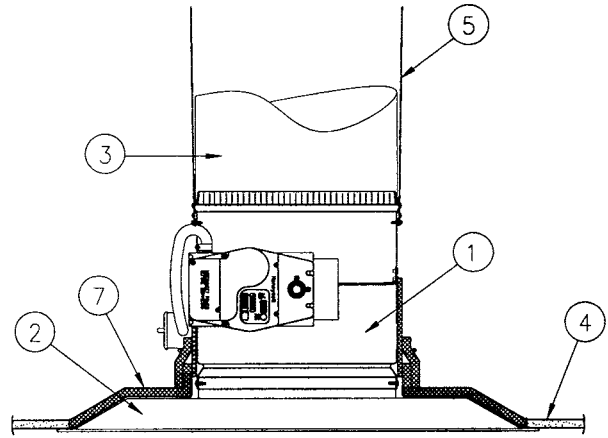


FIGURE 2
Fire Rated Ceiling with Flex Duct

- | ITEM | DESCRIPTION |
|------|---|
| 1. | Integral Sleeve Damper Frame |
| 2. | Surface Mount or Lay-In Ceiling Diffuser |
| 3. | Duct (Flexible or Hard) |
| 4. | U.L. Classified fire-rated ceiling. Refer to the UL Fire Resistance Directory for design information. |
| 5. | 12 gauge Steel Wire |
| 6. | 16 MSG x 1 1/2" Channel |
| 7. | Thermal Blanket Insulation |

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