FLAME FEND®
FIRE SAFETY SPECIALIST

INSTALLATION GUIDE

FLAMESAFE FFD (VS)
CURTAIN FIRE DAMPER

VERTICAL INSTALLATION IN MASONRY WALLS

DOCUMENT

Installation, Operation & Maintenance Guide

1½ and 3 hour · UL 555 · Static systems · Fusible link

SUPPLIED BY

FLAMEFEND LTD

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1. SCOPE, DRAWINGS AND HEALTH AND SAFETY

Scope

Item	Detail
Product	FlameSafe FFD (VS) curtain fire damper
Fire rating	1½ hour (90 minute) and 3 hour (180 minute)
Tested to	UL 555, UL file R27369
Shape	Rectangular or square; round-duct version available
Installation	Vertical in masonry walls ≥ 150 mm thick only (this guide). Not UL listed for horizontal (floor) installation
System	Static systems only – fans must shut down on fire detection
Operation	165 °F (74 °C) fusible link, spring-closed curtain
Markets	UL and NFPA markets, including Africa, Asia and the USA
Materials	See Section 3, Standard construction

Drawings

Drawing	Title
FD-01	General arrangement – elevation
FD-02	Vertical section
FD-03	Plan section
FD-04	Detail – damper housing to sleeve welds
FD-05	Detail – retaining angle to sleeve
FD-06	Breakaway joints
FD-07	Dimensional data

CAD versions are available from FlameFend on request.

Health and safety

- This process must be carried out by competent persons. More than one person may be needed to handle large dampers safely. Use access equipment rather than unsafe practices to reach walls and difficult areas.
- Wear standard site PPE as a minimum (safety boots, hard hat), plus eye protection, gloves and masks when drilling, cutting or handling wall materials. Use hearing protection with loud equipment.
- Welding must only be done by trained operatives under a hot works permit, with combustibles removed and a fire watch in place.
- Lift and handle the damper by its sleeve or frame only – never by the blades.
- The curtain is spring-loaded and closes without warning when the fusible link releases – this is its prime function. Never put items, fingers or limbs inside the damper.
- Collect and dispose of all waste materials in line with local regulations.

2. INSTALLATION METHOD OVERVIEW

Application	Installation method	Drawings
Vertical damper in a masonry wall	Page 6	FD-01, FD-02, FD-03
Installation details (clearance, sleeve, welds, angles, joints)	Page 9	FD-04, FD-05, FD-06

- The method in this guide must be followed to keep the damper's UL listing. It covers single-section dampers. For multi-section assemblies or any non-standard installation, contact FlameFend as early as possible in the project.
- If your proposed installation differs from this guide, discuss it with the authority having jurisdiction (AHJ), referencing this document. Any deviation needs the approval of the relevant authority.
- The instructions are based on the tested method for the FlameSafe FFD (VS), UL file R27369, and the manufacturer's installation details.
- The FFD (VS) is a curtain fire damper with its blades stored outside the airstream, giving 100% free area. It is designed to maintain the fire resistance of walls penetrated by ductwork.
- Under UL 555 the FFD (VS) is rated for 1½ or 3 hours in static systems, tested to the UL 555 time-temperature curve followed by a hose stream test.
- For systems where fans keep running in a fire, or for smoke control, a dynamic-rated or combination fire/smoke damper must be used instead.

Static systems only. The FFD (VS) is not rated to close against airflow. It must only be installed where the fans shut down automatically on fire detection.

Vertical installation only. The FFD (VS) is UL listed for vertical mounting in walls only. It must not be installed horizontally in floors or ceilings. For horizontal applications, use the FlameSafe MSFD-180, which is UL listed for vertical and horizontal mounting.

3. PRODUCT DATA



FFD (VS) installed in masonry wall with retaining angles



Dampers under UL 555 fire test

UL ratings (file R27369)

Rating	Max single section W × H	Max multi-section W × H
3 hour	965 × 1080 mm (38 × 42½ in)	1930 × 2184 mm (76 × 86 in)
1½ hour	965 × 1092 mm (38 × 43 in)	1930 × 2184 mm (76 × 86 in)
1½ hour (alternative)	897 × 897 mm (35⅓ × 35⅓ in)	2692 × 2692 mm (106 × 106 in)

Minimum size 8 × 8 in (203 × 203 mm). All ratings: static systems, vertical mounting only (UL Product iQ, revised 2025-11-24).

Standard construction

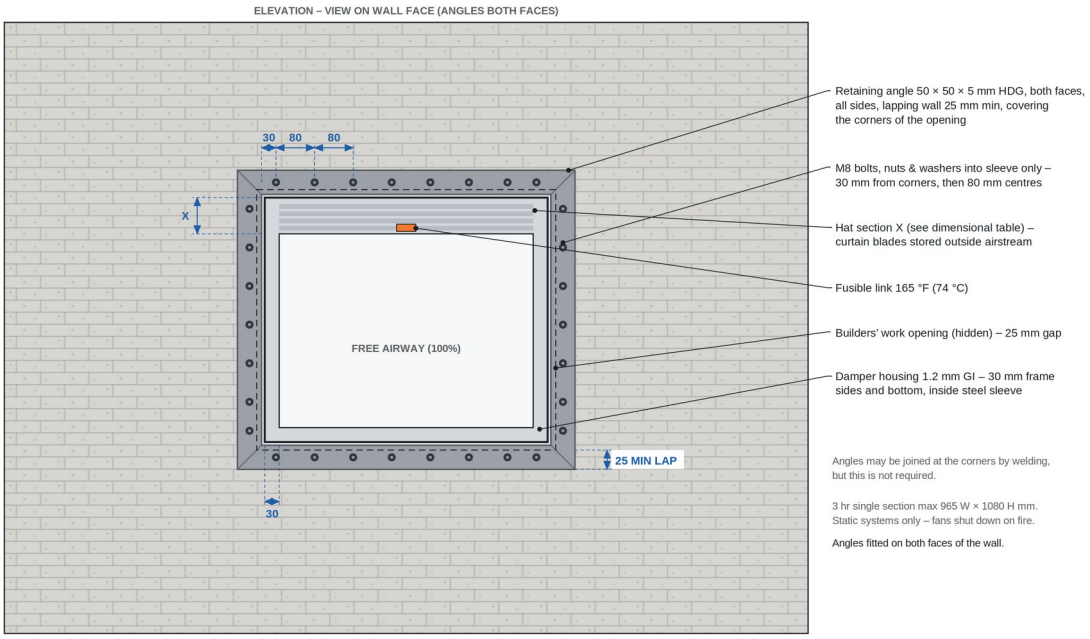
Component	Specification
Type	Curtain blade, blades stored in hat section outside the airstream (100% free area)
Frame / housing	1.20 mm (18 G) galvanised steel
Blades	0.80 mm (22 G) galvanised steel, interlocking
Fusible link	165 °F (74 °C), secured by 18 G steel straps
Springs	Stainless steel, 0.30 mm thick × 19 mm wide
Blade ramp	1.20 mm (18 G) galvanised steel
Finish	Mill finish
Mounting	Vertical
Complies with	NFPA 90A and SMACNA requirements
Options	Round-duct version; additional sleeves to suit TDF flanged ductwork

Testing

- **Fire endurance and hose stream:** exposed to the UL 555 time-temperature curve for 1½ and 3 hours, then a hose stream at 45 psi from 6.1 m (20 ft).
- **Cycling:** 250 full-stroke operations to confirm smooth working.
- **Salt spray:** 120 hours in a salt spray chamber, then tested for closing and latching.

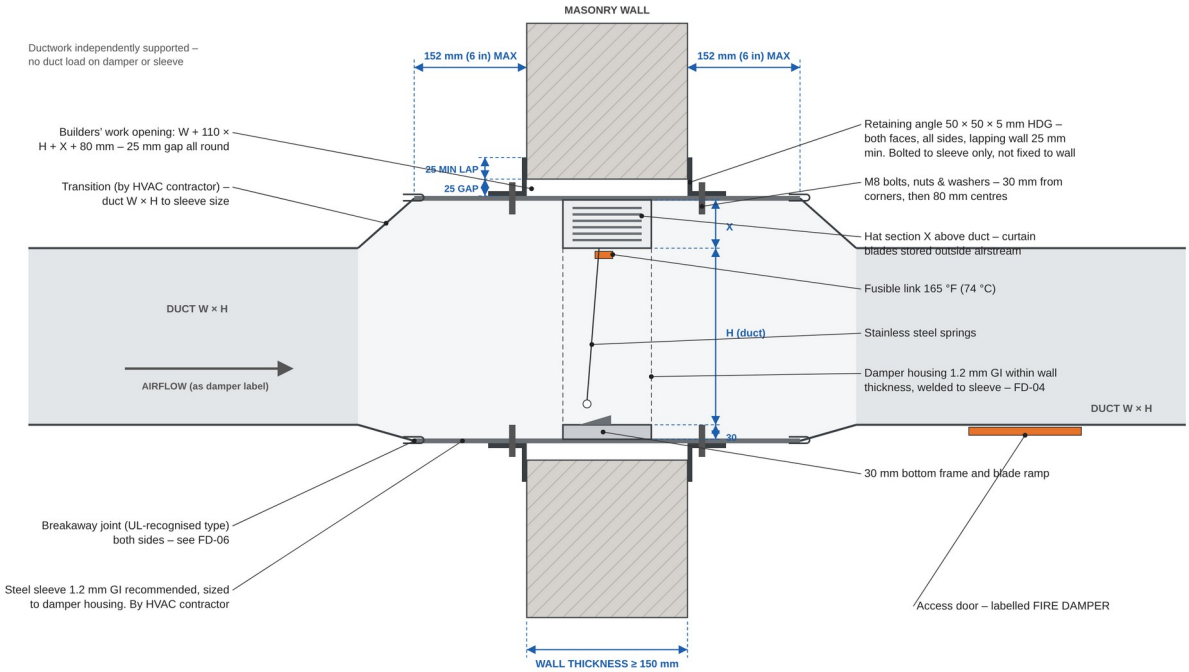
4. VERTICAL DAMPER INSTALLATION IN A MASONRY WALL

FlameSafe FFD (VS) · UL 555 · Static systems · Drawings FD-01, FD-02, FD-03



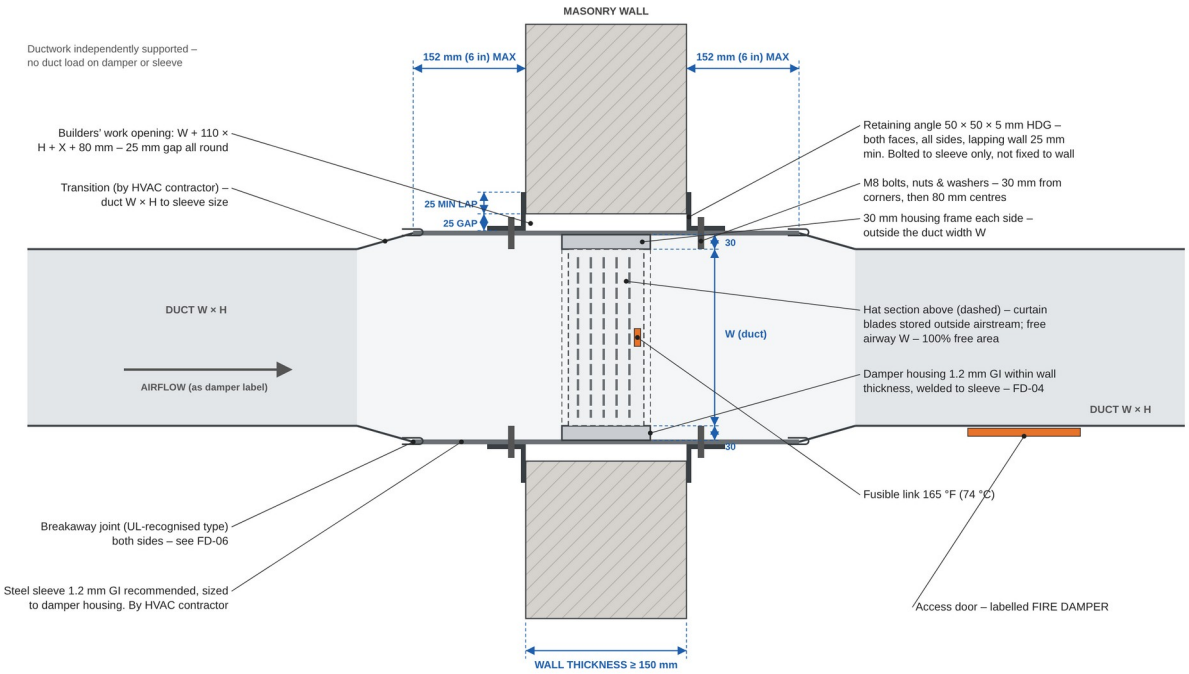
FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe FFD (VS) · UL 555 · UL file R27369	GENERAL ARRANGEMENT FFD (VS) in masonry wall with retaining angles	DRAWING FD-01 Scale: NTS · Rev A	ISSUE DATE October 2026

Drawing FD-01: General arrangement – elevation



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe FFD (VS) · UL 555 · UL file R27369	FFD (VS) – SECTION Vertical section · Static systems only · Hat section above duct	DRAWING FD-02 Scale: NTS · Rev A	ISSUE DATE October 2026

Drawing FD-02: Vertical section



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe FFD (VS) · UL 555 · UL file R27369	FFD (VS) – PLAN Plan section through masonry wall	DRAWING FD-03 Scale: NTS · Rev A	ISSUE DATE October 2026

Drawing FD-03: Plan section

Before installation

- Check the damper schedule for the correct damper locations and confirm the system is static.
- Inspect each damper for damage and check the fusible link is in place and has not activated.
- Lift and handle the damper by its sleeve or frame. Never lift it by the blades.
- Keep the damper clean and protected from dirt, dust and debris before and after installation.

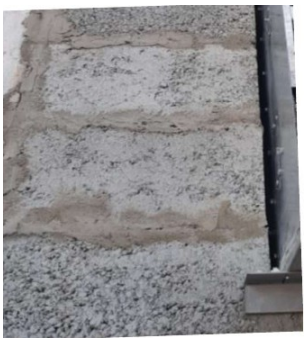
Installation method

1. Check the damper type, size, fire rating and airflow direction against the damper schedule.
2. Check the masonry wall is ≥ 150 mm thick, with a fire rating equal to or greater than the damper.
3. Check the duct size (W × H) and find the hat section height X for the damper height H from the table in Section 8.
4. Set out the opening so there is at least 152 mm (6”) between dampers in separate ducts. Allow about 75 mm between the damper and construction elements or edges for maintenance access (recommended).
5. Form the builders’ work opening to W + 110 mm wide × H + X + 80 mm high (Section 5). This gives the tested 25 mm expansion gap on each side. The opening must be square and true.
6. Weld the damper housing into the sleeve with 15–20 mm long ARC/MIG welds at all four corners and at 100 mm centres (FD-04). Touch up welds with zinc-rich paint.
7. Place the assembly centrally in the opening, with an equal 25 mm gap all round and the damper housing within the wall thickness. The sleeve must not project more than 152 mm (6 in) beyond either wall face.
8. Fit retaining angles on both faces of the wall, on all four sides, lapping the wall by 25 mm minimum (as tested) and covering the corners of the opening. Bolt them to the sleeve only with M8 bolts, nuts and washers, 30 mm from the corners and then at 80 mm centres (FD-05). Do not fix the angles to the wall.
9. Check the damper is square and not racked, twisted, squeezed or stretched. An out-of-square damper may not close.
10. Connect the ductwork to the sleeve on both sides with a transition from duct size to sleeve size and UL-recognised breakaway joints (FD-02, FD-06). Ductwork must be independently supported.
11. Fit an access door next to the damper, large enough to inspect and reset the curtain and replace the fusible link. Label it FIRE DAMPER.
12. Drop test the damper, reset it and fit a new fusible link (Section 6).
13. Complete the inspection and handover check sheet (Section 10).

5. INSTALLATION DETAILS

Builders' work opening and expansion gap

Dimension	Rule
Opening width	W + 110 mm = duct width W + 2 × 30 mm side frames + 50 mm expansion gap (25 mm each side)
Opening height	H + X + 80 mm = duct height H + 30 mm bottom frame + hat section X + 50 mm expansion gap (25 mm top and bottom)
Expansion gap	25 mm installation clearance on all four sides (50 mm total each way). This is the tested gap; do not reduce it.
Gap fill	No requirement to fill the gap



Expansion clearance between sleeve and masonry

Worked examples: a 600 × 400 mm duct has a hat section X = 70 mm, so the builders' work opening is (600 + 110) × (400 + 70 + 80) = 710 × 550 mm. A 300 × 300 mm duct (X = 60 mm) needs 410 × 440 mm. W and H are the nominal duct (damper) size; X is from the table in Section 8.

Damper spacing

- Minimum 152 mm (6") between dampers installed in separate ducts.
- Recommended 75 mm between the damper and construction elements or edges, to allow maintenance access. The manufacturer sets no minimum.

Damper sleeve

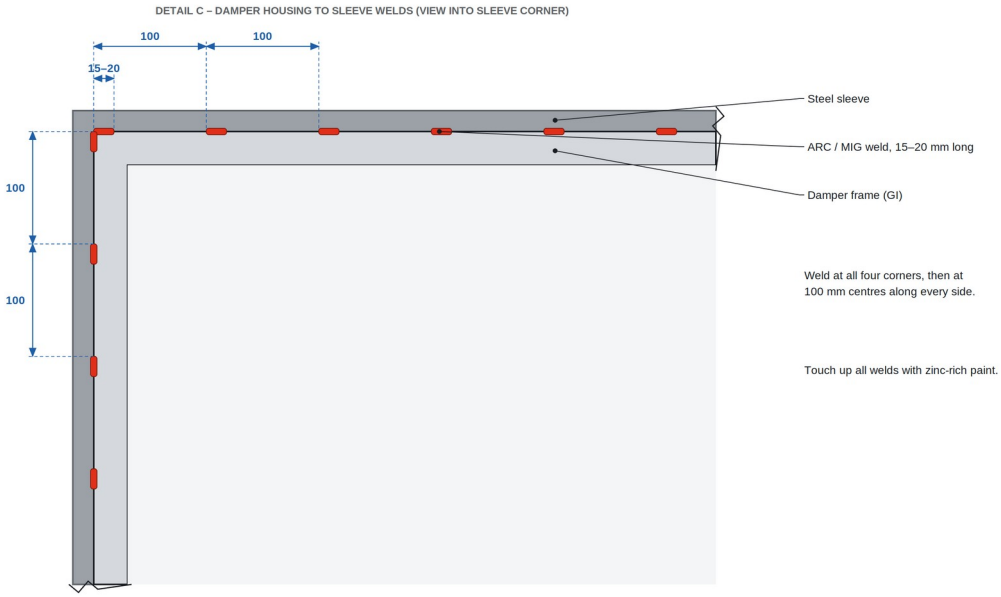
The recommended sleeve is **1.2 mm (18 gauge)** galvanised steel, sized to the damper housing (W + 60 × H + X + 30 mm) and supplied by the HVAC contractor. It must never be thinner than the connecting duct and must end within 152 mm (6 in) of each wall face. Extra sleeves to suit TDF flanged ductwork can be supplied.

Damper housing to sleeve

- ARC or MIG weld the damper housing to the sleeve.
- Welds **15–20 mm long**, at **all four corners** and then at **100 mm centres** along each side.
- Touch up all weld areas with zinc-rich paint.



Welds along the head of the sleeve



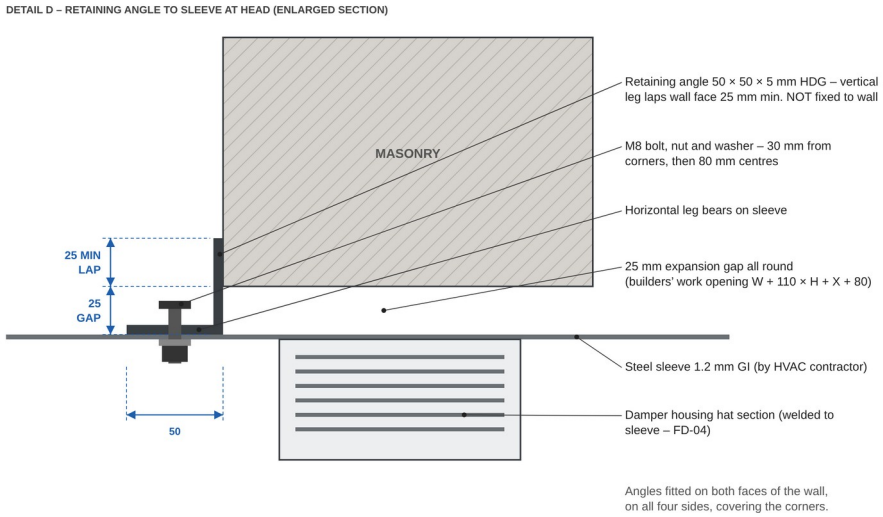
Drawing FD-04: Detail – damper housing to sleeve welds

Retaining angles

- Hot-dip galvanised steel angle, **50 × 50 × 5 mm**.
- Fit on both faces of the wall, on all four sides, lapping the wall by **25 mm minimum** and covering its corners.
- Bolt to the sleeve only with **M8 bolts, nuts and washers**, **30 mm from the corners** and then at **80 mm centres**.
- Do not fix the angles to the wall. Angles may be welded together at the corners, but this is not required.



Retaining angle bolted to sleeve (M8)



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe FFD (VS) · UL 555 · UL file R27369	DETAIL D – ANGLE FIXING Retaining angle to sleeve bolted connection	DRAWING FD-05 Scale: NTS · Rev A	ISSUE DATE October 2026

Drawing FD-05: Detail – retaining angle to sleeve



Retaining angles being fitted on site

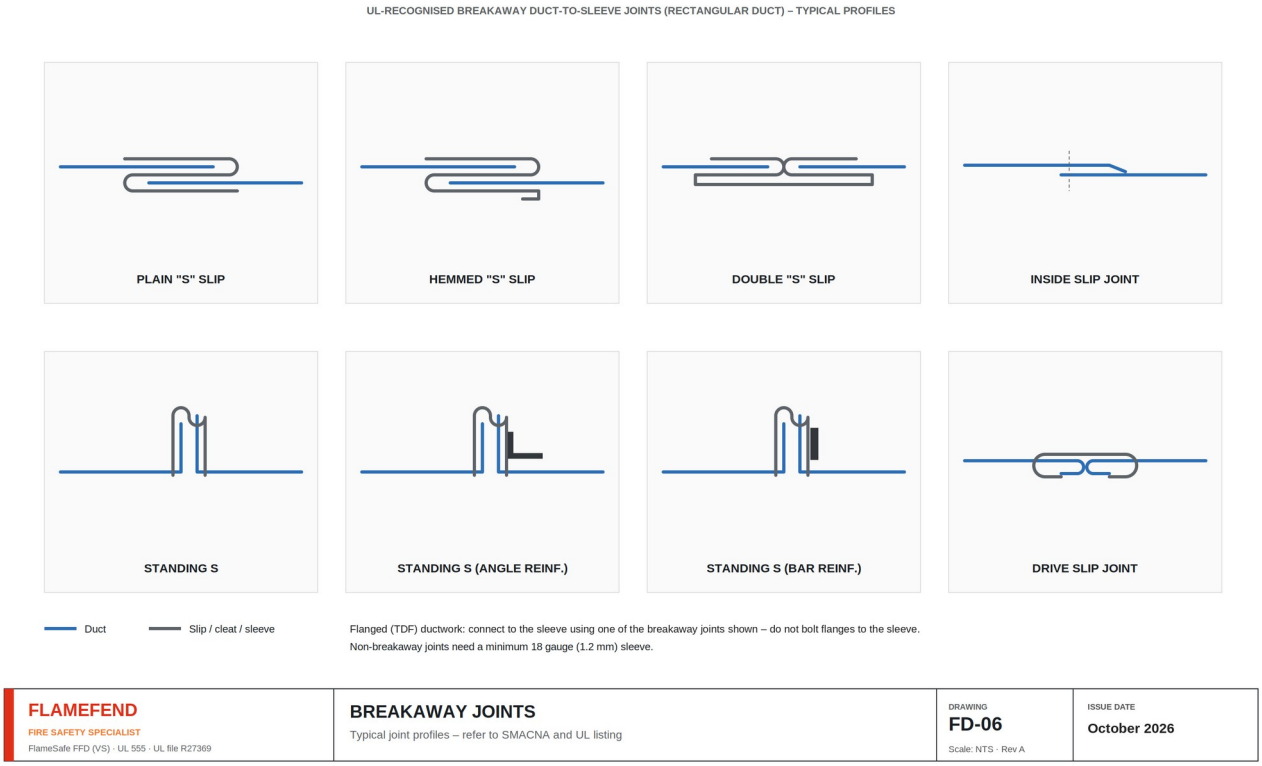


Fixing the damper assembly in the opening

Duct connections

Ducts must not run continuously through the wall. Connect them to the sleeve on both sides with UL-recognised breakaway joints (FD-06): plain, hemmed or double "S" slip; inside slip joint; standing S (plain, alternative, bar- or angle-reinforced); or drive slip joint.

Flanged (TDF) connections: connect the TDF ductwork to the damper sleeve using one of the UL-recognised breakaway joints above, not by bolting the flanges directly to the sleeve. Any other connection needs a minimum 18 gauge (1.2 mm) sleeve.



Drawing FD-06: UL-recognised breakaway joints

Access

- Provide an access door in the duct, or a removable duct section, next to every damper, labelled FIRE DAMPER.
- The door must allow the curtain to be inspected and reset and the fusible link to be replaced.
- Keep the space around the damper clear of other services.

6. FUSIBLE LINK AND DROP TEST

The curtain is held open in the hat section by a 165 °F (74 °C) fusible link secured with 18 G steel straps. When the link melts, the stainless steel springs pull the curtain down and it locks on the blade ramp.

Drop test and reset

1. Remove any transit packing or ties from the curtain.
2. Check the fusible link is stamped 165 °F (74 °C), is seated correctly, and the curtain is held fully open.
3. Through the access door, release the link and check the curtain closes fully and locks on the blade ramp, with nothing obstructing it.
4. Reset the curtain manually to its open position – this must be done by a competent person – and fit a new or undamaged fusible link of the same rating.
5. Never replace a fusible link with wire or any other device, and never wedge the curtain open.

7. PERIODIC MAINTENANCE

Recommended service intervals

Interval	Action	Competence
On completion	Drop test and handover check sheet (Section 10)	Installer
1 year after installation, then every 4 years (6 years in hospitals)	Drop test and inspection – minimum NFPA 80 requirement	Specialist person
Annually (recommended)	Check the curtain closes fully and locks on the blade ramp with no obstruction	Specialist person
Annually (recommended)	Check the fusible link is 165 °F and undamaged; replace if painted, corroded or dust-loaded	Specialist person
Annually (recommended)	Clean the damper; check springs, blades and blade ramp	Specialist person
Annually (recommended)	Check sleeve, retaining angles and breakaway joints are intact	Specialist person
Each visit	Reset the damper, fit a new link if needed, and record the result	Specialist person

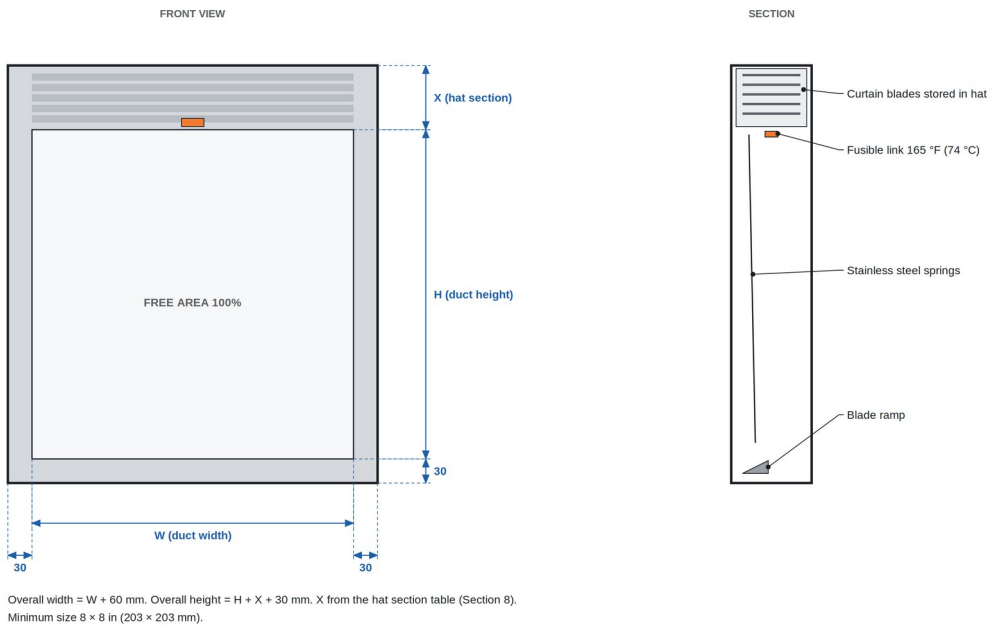
Specialist person: a recognised and experienced person with prior experience in inspecting and assessing fire dampers. Contact FlameFend for advice or inspection and testing services.

Code references

- **NFPA 80:** test fire dampers 1 year after installation, then every 4 years; 6 years in hospitals. Keep written records.
- **NFPA 90A:** access must be provided to inspect and maintain fire dampers and their operating parts.
- **IBC and local building codes:** fire damper installation must also meet IBC Section 717 or the building code adopted by the local authority having jurisdiction, which may require more frequent testing.

Dampers in dusty, greasy, humid or corrosive atmospheres should be tested more often. Any damper found faulty must be repaired or replaced immediately and the fault recorded.

8. DIMENSIONAL DATA



Drawing FD-07: Dimensional data

The housing has a 30 mm frame on the sides and bottom, and a hat section (X) at the head where the curtain is stored. Overall width = W + 60 mm; overall height = H + X + 30 mm. Builders' work opening = W + 110 mm × H + X + 80 mm (Section 5).

Damper height H (mm)	Hat section X (mm)	Damper height H (mm)	Hat section X (mm)
Up to 70	30	501 – 550	80
71 – 125	35	551 – 625	85
126 – 175	45	626 – 700	90
176 – 250	55	701 – 775	95
251 – 300	60	776 – 850	100
301 – 375	65	851 – 875	110
376 – 425	70	876 – 900	155
426 – 500	75	901 – 1092	155

Minimum size 8 × 8 in (203 × 203 mm).

9. TROUBLESHOOTING

Modifications made to the damper will invalidate the UL listing and the warranty.

Fault	Possible cause	Recommended action
Curtain does not close fully	Housing racked, twisted or out of square	Correct or re-install so the damper is square
	Debris, insulation or fixings in the curtain track	Remove obstruction; no screws or rivets into the track
	Duct or sleeve distorted by supports	Remove the cause; support ductwork independently
	Springs damaged	Contact FlameFend; do not modify
Curtain closes but does not lock	Blade ramp damaged or misaligned	Contact FlameFend; do not modify
Link will not hold curtain open	Wrong or damaged link or straps	Fit a new 165 °F link correctly in its straps
Damper closes for no reason	Link weakened by heat, corrosion or paint	Replace link; check duct temperature is well below 165 °F
Damper cannot be reached	No access door, or blocked by services	Fit or clear an access door next to the damper

10. INSPECTION AND HANDOVER CHECK SHEET

The installer must complete this sheet for each FlameSafe FFD (VS) fire damper.

No.	Question	Action	Y / N
1	Is the damper the correct type, size and rating?	Check against the damper schedule and label	
2	Is the system static and the damper installed vertically in a wall?	Not dynamic rated; not for floors	
3	Is the damper located and identified correctly?	Against drawings; unique ID marked	
4	Is the masonry wall ≥ 150 mm thick and of the required rating?		
5	Is the builders' work opening correct?	W + 110 × H + X + 80 mm; 25 mm gap all round	
6	Is the sleeve 1.2 mm and within 152 mm of each face?		
7	Is the housing welded to the sleeve correctly?	15–20 mm welds, corners + 100 mm	
8	Are angles fitted both faces, 25 mm lap, corners covered, bolted to sleeve only?	30 mm from corners, 80 mm centres	
9	Are breakaway joints used on both sides?	Or 18 gauge sleeve	
10	Is the ductwork independently supported?	No load on the damper	
11	Is the damper vertical, square and installed to the airflow label?		
12	Has the space around the damper been kept clear of other services?		
13	Is the access door fitted and labelled FIRE DAMPER?		
14	Has the damper been drop tested, closed and locked fully?		
15	Has it been reset with a 165 °F link in place?		
16	Is the handover register cross-referenced to the damper schedule?		

Damper ID / location	
Project name and address	
Damper size and rating	
Installer / company / phone	
Date of installation	

It is hereby verified that the damper detailed above has been installed and tested according to this installation guide. Installer signature: _____ Date: _____

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CONTACT

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DOCUMENT

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MARKETS

For projects in UL and NFPA markets, including Africa, Asia and the USA. The FFD (VS) is tested to UL 555. It is not classified to EN 1366-2 or EN 15650 and does not carry UKCA or CE marking, so it must not be specified for UK or EU projects.

IMPORTANT

Installation must comply with this guide, the manufacturer's UL listing, the authority having jurisdiction and all applicable local codes. Read this guide together with the approved submittal drawings for each project. FlameFend Ltd accepts no liability for loss or damage arising from installation, maintenance or use that does not follow this guide. The information given is correct at the time of publication, and FlameFend Ltd reserves the right to alter specifications without notice.

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