

INSTALLATION GUIDE

MSFD-180/90

MOTORISED FIRE AND SMOKE DAMPER

VERTICAL INSTALLATION IN MASONRY WALLS

DOCUMENT

Installation, Operation & Maintenance Guide

180 and 90 minute · Spring-return actuator

SUPPLIED BY

FLAMEFEND LTD

FF-IOM-MSFD-01 · Version 1.2 · October 2026

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1. SCOPE, DRAWINGS AND HEALTH AND SAFETY

Scope

Item	Detail
Product	FlameSafe MSFD-180/90 motorised multi-blade fire and smoke damper
Models	MSFD-180/90 and MSFD-180/90-III (see the UL label for the exact model)
Fire rating	180 minutes (3 hours) and 90 minutes (1½ hours)
Tested to	UL 555 and UL 555S, UL file R27369
Shape	Rectangular or square; circular spigot available on request
Installation	Vertical in masonry walls rated up to 3 hours (this guide); horizontal in concrete floors (separate guide)
Markets	UL and NFPA markets, including Africa, Asia and the USA
Materials and actuator	See Section 3, Standard construction

Drawings

Drawing	Title
FD-01	General arrangement – masonry wall installation
FD-02	Detail – View A, sleeve and retaining angles
FD-03	Detail – View B, retaining angle at the masonry wall
FD-04	Breakaway joints
FD-05	Installation sequence – Stage 1 – form the builders' work opening
FD-06	Installation sequence – Stage 2 – place the damper and sleeve
FD-07	Installation sequence – Stage 3 – fit and bolt the mounting angles

Drawings FD-01 to FD-03 are based on the manufacturer's installation guide drawing ID-MFSD180-MW-001 Rev A (MSFD-180/90 rigid wall install). 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.
- Lift and handle the damper by its sleeve or frame only, never by the blades, the actuator or the jackshaft.
- Electrical work on the actuator must only be done by a qualified electrician, with the supply isolated and locked off.
- The actuator spring closes the blades without warning when power is removed or a fire signal is received. Never put hands, tools or other items between the blades or near the jackshaft and drive linkage.
- Collect and dispose of all waste materials in line with local regulations.

2. INSTALLATION METHOD OVERVIEW

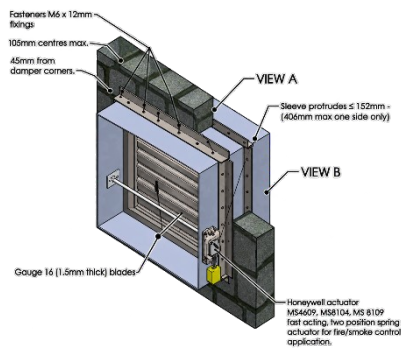
Application	Installation method	Drawings
Vertical damper in a masonry wall	Page 6	FD-01 to FD-07

- The method in this guide must be followed to keep the damper's fire rating. It covers single-section dampers. For multi-section assemblies or any non-standard installation, contact FlameFend as early as possible in the project.
- The instructions are based on the manufacturer's installation guide drawing for the FlameSafe MSFD-180/90 in masonry walls (ID-MFSD180-MW-001 Rev A).
- The MSFD-180/90 is a motorised multi-blade fire and smoke damper with 1.5 mm (16 gauge) galvanised steel blades, closed by a fast-acting spring-return actuator acting through an external jackshaft. It is designed to maintain the fire resistance of masonry walls penetrated by ductwork and to limit the passage of smoke.
- 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.

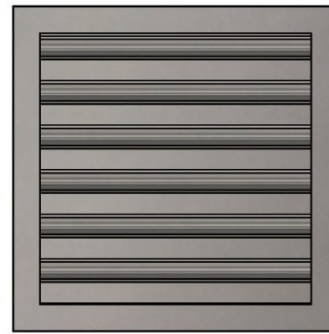
Masonry walls and concrete floors only. This guide covers vertical installation in masonry walls. Horizontal installation in concrete floors is covered in a separate FlameFend guide. The damper is not tested for gypsum (drywall) or other lightweight partitions and must not be installed in them.

Ductwork must be independently supported, with a breakaway joint between the damper sleeve and the connecting ductwork on both sides of the wall.

3. PRODUCT DATA



MSFD-180/90 installed in a masonry wall with retaining angles



MSFD-180/90 front elevation

Fire ratings

Rating	Max single section W × H	Max multi-section W × H
180 minute (3 hour)	36 × 36 in (914 × 914 mm)	72 × 72 in (1829 × 1829 mm)
90 minute (1½ hour)	36 × 36 in (914 × 914 mm)	72 × 72 in (1829 × 1829 mm)

Minimum size 8 × 8 in (203 × 203 mm). Tested to UL 555 and UL 555S. UL file R27369.

Standard construction

Component	Specification
Type	Motorised multi-blade fire and smoke damper, UL file R27369
Blades	1.5 mm (16 gauge) galvanised steel
Frame / housing	1.5 mm (16 gauge) galvanised steel
Actuator	Honeywell MS4609, MS8104 or MS8109; fast-acting, two-position, spring return. Mounted outside the sleeve, or inside the damper tunnel where space is limited
Drive	External jackshaft across the damper face, in front of the blades. Passes through the sleeve into the actuator shaft clamp, with a bearing bracket on the opposite sleeve wall and a drive crank and link to the blades
Fail-safe position	Closed on loss of power
Thermal release	74 °C (165 °F)
Mounting	Vertical, in masonry walls at least 150 mm thick, blades horizontal Horizontal, in concrete floors 150 mm thick
Retaining angles	RSA (rolled steel angle) 50 × 50 × 5 mm
Angle fixings	M6 × 12 mm nut and bolt; 120 mm centres maximum; first fixing no more than 30 mm from each corner
Sleeve	Factory-fitted 1.5 mm (16 gauge) galvanised steel, maximum depth 460 mm. Protrudes no more than 406 mm from the wall face on one side and 152 mm on the other. See Section 4, Stage 2.

Testing

- Fire endurance and hose stream: tested to UL 555 for 3 hours and 1½ hours.
- Cycling and actuator closure: tested to UL 555 and UL 555S.
- Leakage: tested to UL 555S, Class I at 2000 fpm and 4 in. w.g. (MSFD-180/90).

4. VERTICAL DAMPER INSTALLATION IN A MASONRY WALL

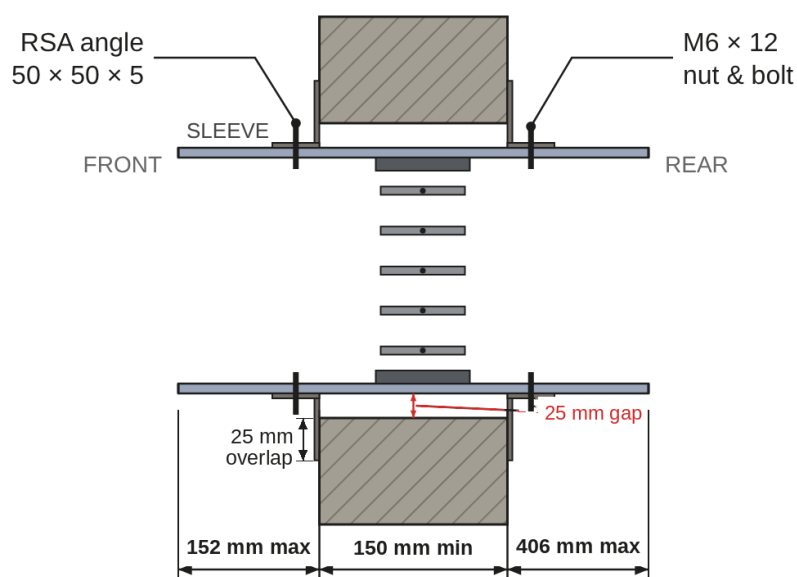
FlameSafe MSFD-180/90 · Masonry wall · Vertical · Drawings FD-01 to FD-07

Before installation

- Check the damper schedule for the correct damper locations, sizes and fire ratings.
- Inspect each damper for damage. Check the blades move freely and the actuator is undamaged.
- Lift and handle the damper by its sleeve or frame. Never lift it by the blades, the actuator or the jackshaft.
- Keep the damper clean and protected from dirt, dust and debris before and after installation.

Stage 1 – Form the builders' work opening

Dimension	Rule
Purpose	The opening must be larger than the damper to allow for installation and expansion
Opening width	Duct width + 50 mm (builders' work opening size)
Opening height	Duct height + 50 mm
Clearance	25 mm installation clearance on all four sides of the damper (25 mm per side). This is the tested gap; do not reduce it.
Gap fill	No requirement to fill the gap



Sleeve protrusion: 406 mm max one side, 152 mm max on the other side

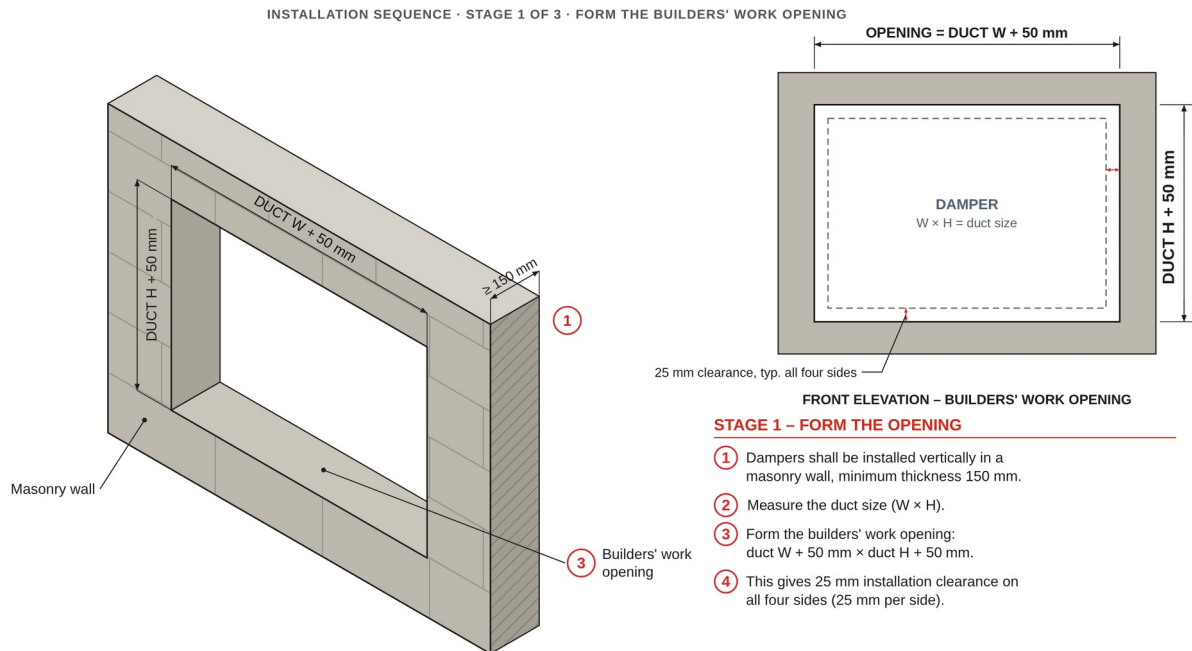
Section through the wall: RSA angles bolted to the sleeve on both faces, with 25 mm clearance to the opening

Worked examples: a 610 × 305 mm duct needs a builders' work opening of 660 × 355 mm. A 1219 × 610 mm duct needs an opening of 1269 × 660 mm.

Circular spigot dampers: the damper body is rectangular and typically 50–75 mm larger than the circular duct (for example, a 400 mm diameter duct uses a 450–475 mm damper). Base the builders' work opening on the damper body size + 50 mm, not the duct diameter.

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.



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe MSFD-180/90 · Masonry wall · Vertical	STAGE 1 – FORM THE OPENING Builders' work opening in the masonry wall	DRAWING FD-05 Scale: NTS · Rev A	ISSUE DATE October 2026
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Drawing FD-05: Installation sequence, Stage 1 – form the builders' work opening

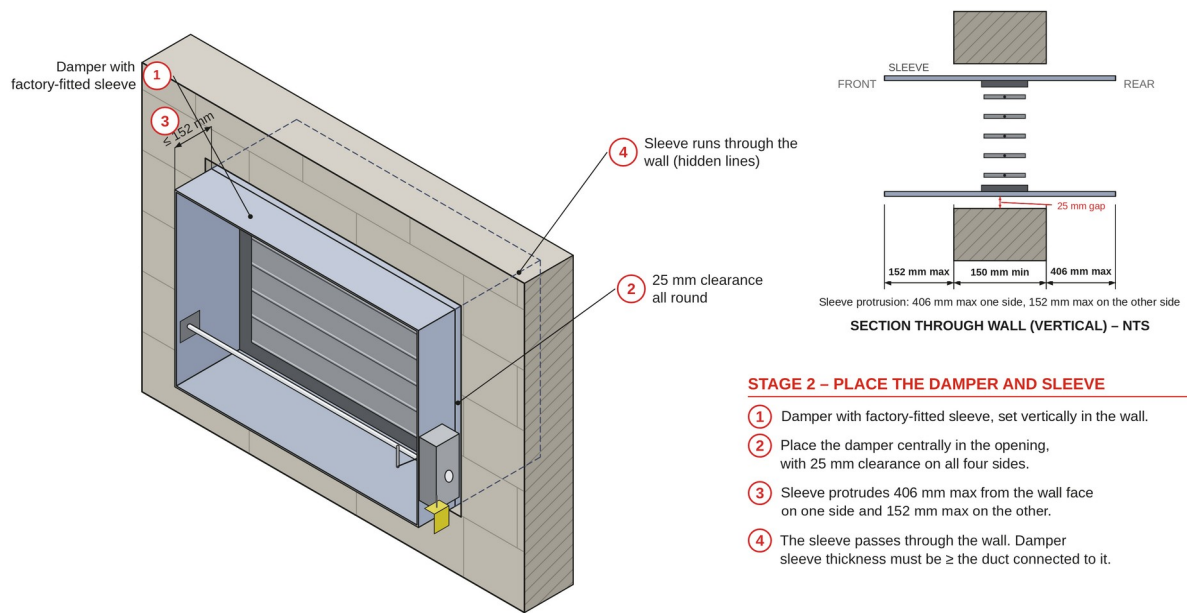
Stage 2 – Place the damper and sleeve

Place the damper, complete with its factory-fitted sleeve, centrally in the opening with the 'Mount with arrow up' label pointing upwards, so the blades are horizontal. Keep 25 mm clearance on all four sides. When closed, the blade edges must sit within the wall opening.

The damper is supplied with a factory-fitted 1.5 mm (16 gauge) galvanised steel sleeve, up to 460 mm deep. This is thicker than the minimum sleeve gauge that SMACNA and NFPA 90A require for every duct size up to the maximum damper size, with or without breakaway joints. The sleeve must be at least as thick as the duct connected to it.

The sleeve must not protrude more than 406 mm from the wall face on one side and 152 mm on the other.

INSTALLATION SEQUENCE · STAGE 2 OF 3 · PLACE THE DAMPER AND SLEEVE



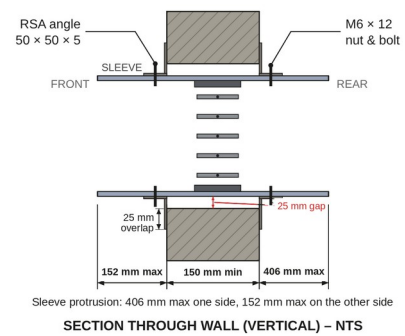
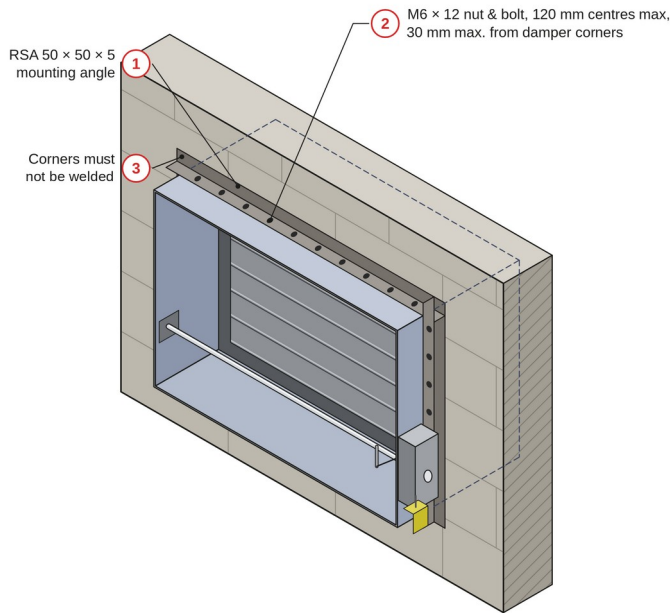
FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe MSFD-180/90 · Masonry wall · Vertical	STAGE 2 – PLACE DAMPER AND SLEEVE Damper with factory-fitted sleeve set centrally in the opening	DRAWING FD-06 Scale: NTS · Rev A	ISSUE DATE October 2026
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Drawing FD-06: Installation sequence, Stage 2 – place the damper and sleeve

Stage 3 – Fit and bolt the retaining angles

- RSA (rolled steel angle) mounting angles, 50 × 50 × 5 mm.
- Fit on both faces of the wall (two-angle installation) and on all four sides, with a minimum overlap onto the wall of 25 mm.
- Attach to the sleeve with M6 × 12 mm nuts and bolts at 120 mm centres maximum, with the first fixing no more than 30 mm from each corner.
- No screw, rivet or fixing may penetrate the blade travel zone.
- The angles must not be welded at the corners.
- Do not fix the angles to the wall. They are bolted to the sleeve only, so the damper is free to expand.

INSTALLATION SEQUENCE · STAGE 3 OF 3 · FIT AND BOLT THE MOUNTING ANGLES



STAGE 3 – FIT AND BOLT THE ANGLES

- ① RSA angles 50 × 50 × 5 mm, both faces of the wall, all four sides, minimum 25 mm overlap onto wall.
- ② Attach the angles to the sleeve with M6 × 12 mm nut and bolt: 120 mm centres max, 30 mm max. from damper corners.
- ③ The angles must not be welded at the corners.

FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe MSFD-180/90 · Masonry wall · Vertical	STAGE 3 – FIT THE MOUNTING ANGLES RSA angles bolted to the sleeve on both faces of the wall	DRAWING FD-07 Scale: NTS · Rev A	ISSUE DATE October 2026
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Drawing FD-07: Installation sequence, Stage 3 – fit and bolt the mounting angles

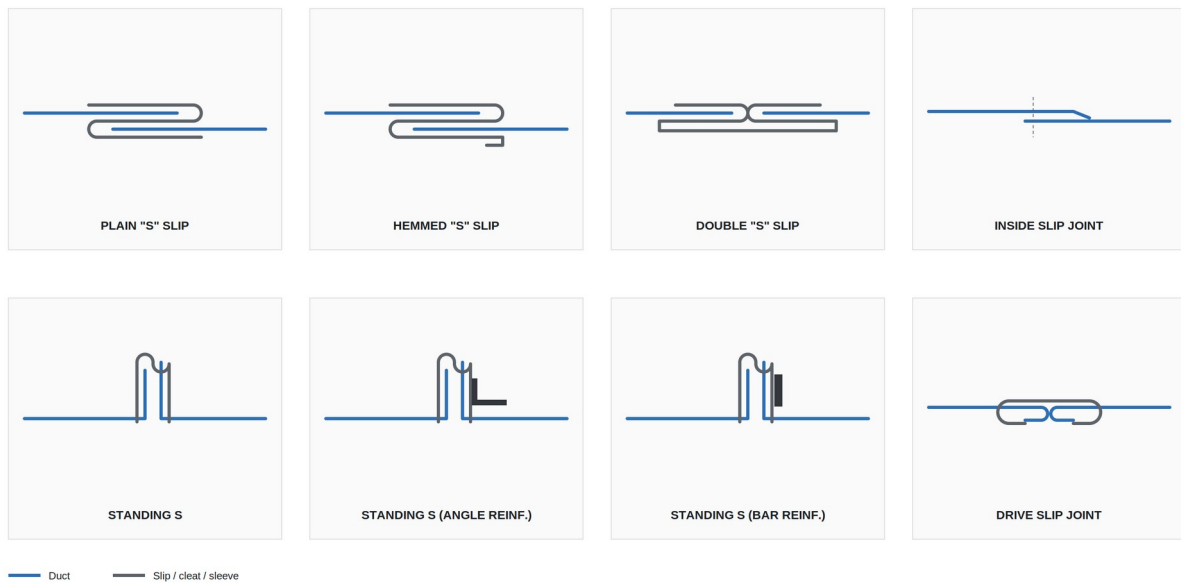
Stage 4 – Connect the ductwork

Ducts must not run continuously through the wall. For rectangular ducts, connect them to the sleeve on both sides using one of the UL-recognised breakaway joints shown in drawing FD-04: plain, hemmed or double “S” slip; inside slip joint; standing S (plain, angle- or bar-reinforced); or drive slip joint.

For round and oval ducts, use a transition of similar thickness to the sleeve, fixed with Ø4.8 × 10 mm rivets or No. 10 sheet metal screws: up to 3 fixings for ducts 559 mm (22 in) wide or smaller, and up to 5 for ducts over 559 mm and up to 914 mm (36 in) wide. Apply approved duct sealant to SMACNA recommendations.

Breakaway joints are supplied and installed by the ductwork contractor. Connecting ductwork must be independently supported.

UL-RECOGNISED BREAKAWAY DUCT-TO-SLEEVE JOINTS (RECTANGULAR DUCT) - TYPICAL PROFILES



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FIRE SAFETY SPECIALIST
FlameSafe MSFD-180/90 - Masonry wall - Vertical

BREAKAWAY JOINTS

Typical joint profiles – refer to SMACNA and the damper listing

DRAWING
FD-04

Scale: NTS - Rev A

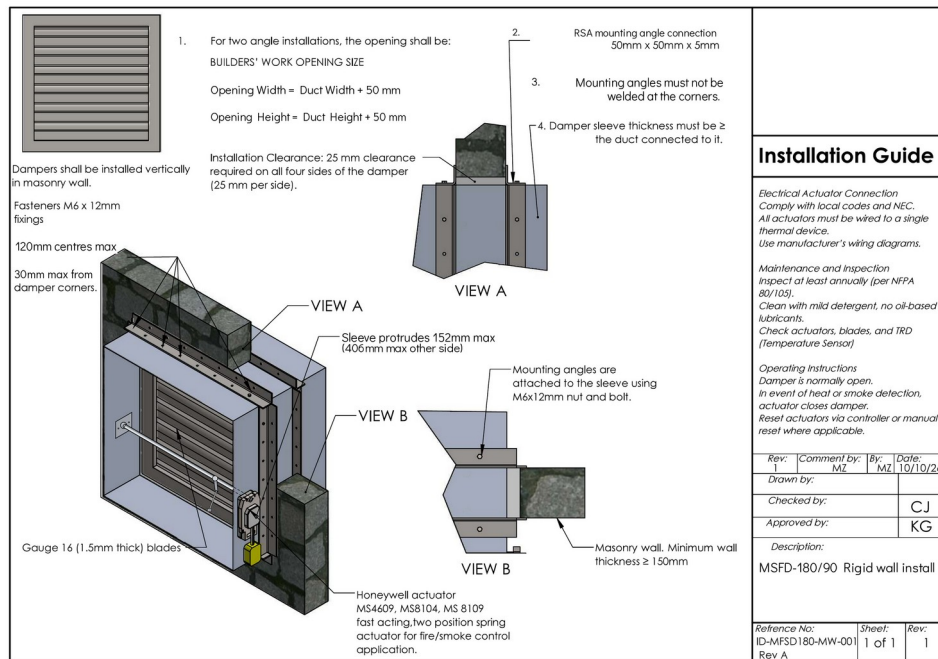
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Drawing FD-04: Breakaway joints

Access

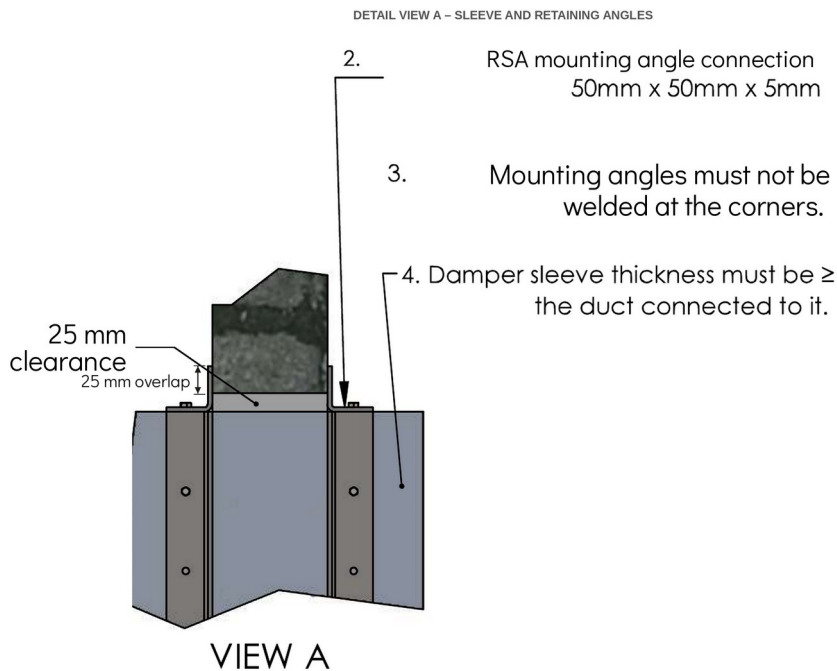
- Provide an access door in the duct, or a removable duct section, next to every damper, labelled FIRE/SMOKE DAMPER (N).
- The door must allow the blades, actuator, jackshaft and drive linkage to be inspected and tested.
- Keep the space around the damper and actuator clear of other services.

Completed installation – general arrangement and details



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe MSFD-180/90 - Masonry wall - Vertical	GENERAL ARRANGEMENT Masonry wall installation – based on the manufacturer's installation drawing	DRAWING FD-01 Scale: NTS - Rev A	ISSUE DATE October 2026
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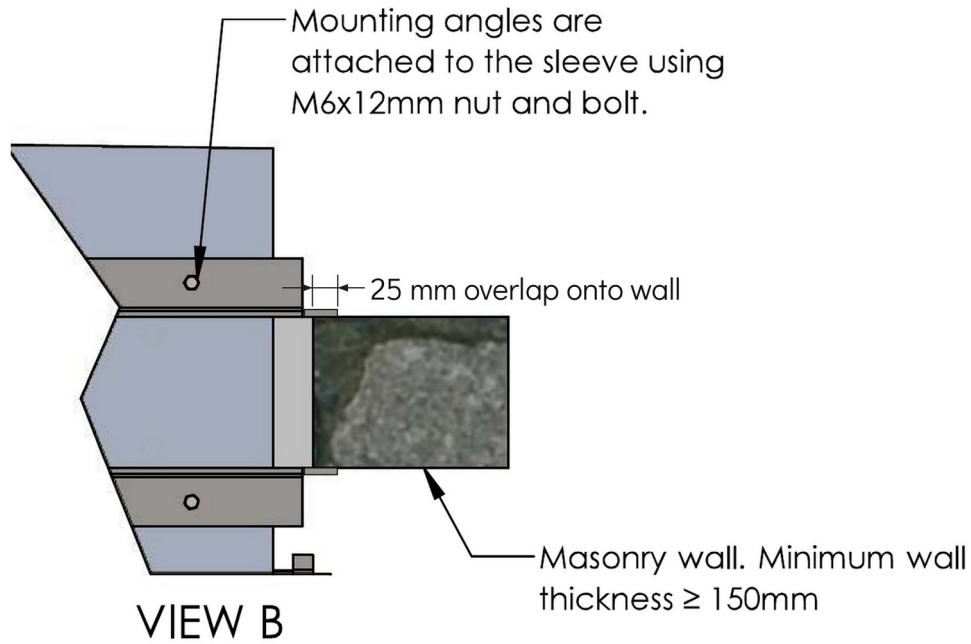
Drawing FD-01: General arrangement – masonry wall installation



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe MSFD-180/90 - Masonry wall - Vertical	DETAIL – VIEW A Damper sleeve and retaining angles at the head of the damper	DRAWING FD-02 Scale: NTS - Rev A	ISSUE DATE October 2026
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Drawing FD-02: Detail – View A, sleeve and retaining angles

DETAIL VIEW B – RETAINING ANGLE AT MASONRY WALL



FLAMEFEND FIRE SAFETY SPECIALIST FlameSafe MSFD-180/90 - Masonry wall - Vertical	DETAIL – VIEW B Retaining angle bolted to the sleeve at the masonry wall	DRAWING FD-03 Scale: NTS - Rev A	ISSUE DATE October 2026
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Drawing FD-03: Detail – View B, retaining angle at the masonry wall

Installation method – step by step

1. Check the damper type, size, fire rating and airflow direction against the damper schedule.
2. Check the masonry wall is at least 150 mm thick and rated no more than 3 hours. The damper rating must be at least 90 minutes for walls rated under 3 hours, and 180 minutes for 3 hour walls, unless the damper schedule says otherwise (FD-05).
3. Take the duct size (W × H). The damper is made to the duct dimensions. For circular spigot dampers, see the note under Stage 1.
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 at duct width + 50 mm by duct height + 50 mm, giving 25 mm installation clearance on all four sides (Stage 1, FD-05).
6. Place the damper, complete with its factory-fitted sleeve, centrally in the builders' work opening with the 'Mount with arrow up' label pointing upwards, so the blades are horizontal. Keep 25 mm clearance on all four sides. When closed, the blade edges must sit within the wall opening (FD-06).
7. Check the sleeve protrusion: no more than 406 mm from the wall face on one side and 152 mm on the other (Stage 2).
8. With the damper held square in the opening, fix the RSA mounting angles, 50 × 50 × 5 mm, to the damper sleeve on both faces of the wall and on all four sides. Bolt them to the sleeve with M6 × 12 mm nuts and bolts at 120 mm centres maximum, with the first fixing no more than 30 mm from each corner. Minimum lap onto the wall is 25 mm. Do not fix the angles to the wall; the damper must be free to expand (FD-07, FD-02, FD-03).
9. Make sure no screws, rivets or other fixings penetrate the blade travel zone.
10. Check the damper is square and not racked, twisted, squeezed or stretched. An out-of-square damper may not close.
11. Check the jackshaft turns freely in its bearing bracket and is secured in the actuator shaft clamp, and that the drive crank and link to the blades are tight.
12. Connect the damper sleeve to the connecting ductwork on both sides of the wall using the recommended breakaway joint fixings, supplied by the ductwork contractor (Stage 4, FD-04). Ductwork must be independently supported.
13. Have a qualified electrician wire the actuator to the fire alarm or BMS control, to the wiring diagram (Section 5).
14. Fit an access door next to the damper, large enough to inspect the blades, actuator and jackshaft. Label it FIRE/SMOKE DAMPER (N).
15. Test the damper (Section 5).
16. Complete the inspection and handover check sheet (Section 8).

5. ACTUATOR AND FUNCTIONAL TEST

The MSFD-180/90 is driven open by a Honeywell MS4609, MS8104 or MS8109 fast-acting, two-position spring-return actuator. The actuator is normally mounted on the outside of the sleeve; where space is limited it can be mounted inside the damper tunnel. Both positions are tested and certified. The actuator turns a jackshaft that runs across the damper face in front of the blades, passes through the sleeve into the actuator shaft clamp and is supported in a bearing bracket on the opposite sleeve wall. A drive crank and link connect it to the blades. When power is removed by a fire alarm, smoke detection or BMS signal, or when the thermal release operates at 74 °C (165 °F), the actuator spring drives the blades closed.

Electrical connection

- Wiring must only be done by a qualified electrician, with the supply isolated and locked off.
- Check the supply voltage, 24 V or 230 V, matches the actuator model fitted.
- Wire to the manufacturer's wiring diagram and the Honeywell actuator instructions.
- All actuators must be wired to a single thermal release device (TRD).
- Do not remove, modify or replace the actuator. This will invalidate the fire rating and the warranty.

Functional test

1. Remove any transit packing or ties from the blades.
2. Power the actuator and check the damper drives fully open, with the blades moving freely and the jackshaft turning smoothly in its bearing.
3. Remove power, or trigger the fire/smoke signal, and check the blades spring fully closed with nothing obstructing them.
4. Restore power and check the damper re-opens fully. Where end switches are fitted, check the open/closed indication at the panel or BMS.
5. Never wedge the blades open, disconnect the spring return or jackshaft, or bypass the actuator.

6. PERIODIC MAINTENANCE

Recommended service intervals

Interval	Action	Competence
On completion	Functional test and handover check sheet (Section 8)	Installer
At least annually	Functional test and inspection (per NFPA 80 and NFPA 105)	Specialist person
Annually	Check the blades spring fully closed on loss of power, with no obstruction	Specialist person
Annually	Check the actuator, wiring, thermal release device (TRD), jackshaft, bearing bracket and drive linkage are secure and undamaged	Specialist person
Annually	Clean the damper with mild detergent (no oil-based lubricants); check the blades and frame	Specialist person
Annually	Check the sleeve, retaining angles, M6 angle fixings and breakaway joints are intact	Specialist person
Each visit	Return the damper to its normal position and record the result	Specialist person

A specialist person is someone recognised and experienced in inspecting and assessing fire and smoke dampers. Contact FlameFend for advice, or for inspection and testing services.

Code references

- NFPA 80: fire dampers must be tested 1 year after installation, then at least every 4 years (6 years in hospitals). This guide requires inspection at least annually, which exceeds that minimum. Keep written records.
- NFPA 105: as the MSFD-180/90 is a fire and smoke damper, smoke damper testing must also meet NFPA 105.
- 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.

7. TROUBLESHOOTING

Modifications made to the damper will invalidate the fire rating and the warranty.

Fault	Possible cause	Recommended action
Damper does not close fully	Housing racked, twisted or out of square	Correct or re-install so the damper is square
	Debris, insulation or fixings obstructing the blades	Remove obstruction; no screws or rivets into the damper
	Duct or sleeve distorted by supports	Remove the cause; support ductwork independently
	Actuator spring, jackshaft or linkage fault (e.g. loose shaft clamp or crank)	Check the shaft clamp and crank are tight; otherwise contact FlameFend. Do not modify
Damper does not open	No power or wiring fault	Check supply voltage and wiring against the wiring diagram
	Fire or smoke signal still active	Reset the fire alarm or BMS signal
Damper closes for no reason	Supply interrupted or control signal lost	Check supply and control wiring
No open/closed indication (where end switches are fitted)	End switch not wired or faulty	Check end switch wiring and signals
Damper cannot be reached	No access door, or blocked by services	Fit or clear an access door next to the damper

8. INSPECTION AND HANDOVER CHECK SHEET

The installer must complete this sheet for each FlameSafe MSFD-180/90 fire and smoke 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 damper installed vertically in a masonry wall?	Floors are covered in a separate guide	
3	Is the damper located and identified correctly?	Against drawings; unique ID marked	
4	Is the masonry wall of the required rating and thickness?	150 mm min; rated up to 3 hours	
5	Is the opening size correct?	Duct W + 50 mm × H + 50 mm (25 mm clearance all round)	
6	Are the spacings to other dampers and construction kept?	152 mm min / 75 mm recommended	
7	Does the sleeve meet the thickness and protrusion limits?	406 mm max one side / 152 mm max other side	
8	Is the factory-fitted sleeve secure and undamaged?	No site welding to the sleeve or angles	
9	Are 50 × 50 × 5 mm RSA angles fitted on both faces, bolted to the sleeve only (not the wall)?	M6 × 12 mm, 120 mm centres max, 30 mm max from corners	
10	Are breakaway joints used on both sides?	UL-recognised joints (FD-04)	
11	Is the ductwork independently supported?	No load on the damper	
12	Is the damper square, arrow up, blades horizontal and within the wall?	Check the orientation label	
13	Is the blade travel zone free of screws and fixings?		
14	Has the space around the damper been kept clear of other services?		
15	Has the actuator been wired by a qualified electrician to the correct supply?		
16	Is the access door fitted and labelled FIRE/SMOKE DAMPER (N)?		
17	Has the damper been tested, opening fully and springing fully closed on loss of power?		
18	Is the jackshaft fitted, secured in the actuator shaft clamp and turning freely in its bearing bracket?	Crank and link to blades tight	
19	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: _____



CONTACT

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DOCUMENT

FlameSafe MSFD-180/90 Motorised Fire and Smoke Damper
Installation, Operation & Maintenance Guide

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MARKETS

For projects in UL and NFPA markets, including Africa, Asia and the USA. The MSFD-180/90 is tested to UL 555 and UL 555S. 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 manufacturer's installation drawing ID-MFSD180-MW-001 Rev A and 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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