

AIRCON

MECHANICAL SERVICES LIMITED

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Fire Drop Test

Certificate to verify that a Fire damper drop test was satisfactory carried out at the project listed below:

Date of Test: 11.11.2021

Project: East Midlands Gateway, Plot 9

Conducted on behalf of: Phase Mechanical Projects Ltd.

Test carried out by: Tom Starkey (Aircon Mechanical Services Ltd)

Witnessed by: Marin Cernei (Phase Mechanical Projects Ltd)

Comments: No additional comments reported

MECHANICAL SERVICES LIMITED

Test procedure:

All of the fire dampers were selected for drop test from attached schedule. Access hatch was removed and link released to enable shutters to close. When operation proved and witnessed satisfactory fire damper were reset.

It was proven that all Fire Dampers tested operated as manufactures recommendation and all inspection hatches fitted were of adequate size.



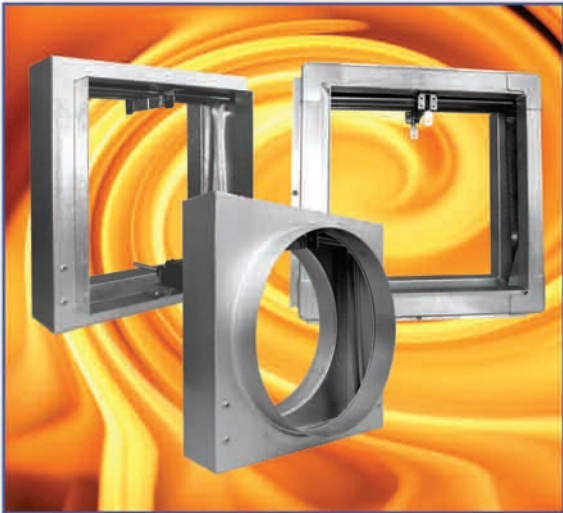
Phil Neal
Contracts and Project Manager
AIRCON MECHANICAL SERVICES LIMITED

2110-Plot 9 EMG Fire damper Schedule and drop test

Main Office

FD No.	Location	Drop test	Installer signature of acceptance
	Main office		
FD -01	G.F. ceiling void	Yes	Phil Neal
FD -02	G.F. ceiling void	Yes	Phil Neal
FD -03	G.F. ceiling void Fire Curtain	Yes	Phil Neal
FD -04	G.F. ceiling void Fire Curtain	Yes	Phil Neal
FD -05	G.F. ceiling void cleaners' room	Yes	Phil Neal
FD -06&7	G.F. ceiling void riser	Yes	Phil Neal
		Yes	Phil Neal
FD 1-01	G.F. ceiling void	Yes	Phil Neal
FD 1-02	G.F. ceiling void	Yes	Phil Neal
FD 1-03	G.F. ceiling void Fire Curtain	Yes	Phil Neal
FD 1 -04	G.F. ceiling void Fire Curtain	Yes	Phil Neal
FD 1-05	G.F. ceiling void cleaners' room	Yes	Phil Neal
FD 1-06&7	G.F. ceiling void riser	Yes	Phil Neal
	Hub office		
FD -01	G.F. ceiling void	Yes	Phil Neal
FD -02	G.F. ceiling void	Yes	Phil Neal
FD -03	G.F. ceiling void	Yes	Phil Neal
FD 1-01	G.F. ceiling void	Yes	Phil Neal
FD 1-02	G.F. ceiling void	Yes	Phil Neal
FD 1-03	G.F. ceiling void	Yes	Phil Neal

FD Series



Fire Dampers

- Complies to BS EN 15650
- Tested installation methods in differing supporting constructions (BS EN 1366-2)
- E classified fire dampers complying with BS EN 13501-3
- FD-AF has been tested both vertically and horizontally. It is installed using single side access without the need to provide fire rated infill material
- Galvanised and stainless steel options
- Microswitch option for remote indication



MANUFACTURERS OF AIR, FIRE AND SMOKE CONTROL PRODUCTS



FD Series

Fire Dampers - Introduction



Introduction

What is a fire damper and why might they be needed?

The FD Series Steel Curtain Fire Damper is designed to stop the spread of fire through ducts, walls, floors and ceilings.

The product range has many features and options to meet the requirements of specifiers, contractors, local and national authorities. Dampers are available to suit both low/medium and high velocity applications.

What is the 'E' classification?

To achieve the classifications to EN13501-3, fire dampers and fire and smoke dampers shall be tested to EN1366-2 and a 300Pa pressure difference is applied across the damper. During the fire test period, the integrity of the seal between the damper and the structure shall not have any gaps larger than 150mm x 6mm. There shall not be any sustained flaming. The largest size of damper to be manufactured for sale as a single section shall be fire tested.

E = Integrity

The maximum leakage permissible at 300Pa corrected to 20°C is 360m³/hr/m² (100 l/s/m²) throughout the fire test period.

Fire dampers should be installed as tested.

BSB have a policy of continued testing and product certification to try and provide as broad a number of installation methods as possible.

BSB also follow regulation and standards development very carefully to provide input on changes and to be able to pass on relevant information to designers, specifiers, building control authorities (BCA's) and installers.

The FD Series Range

The BSB FD series is available in a variety of vertical or horizontal mounting configurations from 100mm x 100mm to 1200mm wide x 1000mm high.

Type FD Rectangular Spigot

A - Blades in airstream on heights greater than 300mm.

B - Blades held clear of the airstream.

Type FD Circular Spigot

C - Blades held clear of the airstream.

Type FD Flat Oval Spigot

O - Blades held clear of the airstream.



FD Features and Benefits

- Tested and classified installation variants of the FD are available to cover masonry walls, dry walls and concrete floors. These cover the majority of applications/supporting constructions that are required to maintain compartmentation.
- All BSB tested installation methods give the highest E120 classification.
- Angle frame methods, HEVAC frame methods and cleat and drop rod methods are available.
- Minimum size 100mm x 100mm.
- Maximum single section size 1200mm x 1000mm.
- In millimetre increments.
- Multi-section configurations are available to specific customer requirements, but will be subject to BCA approval.
- Standard construction is a fully welded galvanised steel case, which gives a casing leakage that complies with Class C ductwork leakage specifications.
- Other combinations of galvanised mild steel, type 1.4016 (430) and 1.4401 (316) stainless steels for the blades and case are available to specific customer requirements.
- The BSB FD has a strong and robust design to both meet the exacting fire testing requirements and be resilient to site handling. This is supported by sound production techniques which result in a quality product.
- All the above, supported with BSB's enviable delivery performance, provide an unbeatable combination.

Testing and Conformities



See installations section for full details.

E Classification (BS EN 1366-2/BS EN 13501-3)

- BSB FD fitted with HEVAC frame
 - E 120 - Blockwork/masonry wall
 - E 120 - Concrete floor
- BSB FD fitted with cleats
 - E 120 - Dry partition wall
- BSB FD fitted with angle frame
 - E 120 - Dry partition wall
 - E 120 - Concrete floor
 - E 120 - Masonry Wall

E Classification (BS ISO 21925-1)

- As BS EN 1366-2/BS EN 13501-3 above

Corrosion testing (ASTM B117)

- Tested and satisfies LPS 1162

FD Blade leakage (BS EN 1751)

- Class 2

Regulations and Standards

Approved Document B: Fire safety (ADB)

ADB is the UK government's guide to fulfilling the Building Regulations in terms of fire safety. It is available as a free download from the planning portal website.

It gives clear guidance on where fire dampers are to be used and what their performance or classification shall be. The BSB FD fulfils the E classification and reference should be made to the installation method to confirm exact time periods. These will generally be up to 120 minutes.

Health Technical Memo 05/02 (HTM05/02)

HTM05/02 is the Department of Health Firecode - fire safety in the NHS: Guidance in support of functional provisions for healthcare premises.

It basically underlines the requirements stated in ADB, requiring fire damper testing to BS EN 1366-2 and classification to BS EN 13501-3.

It supersedes HTM81 and should be read in conjunction with HTM2025: Ventilation in healthcare premises, as it gives guidance on maintenance and testing.

Building Bulletin 100

BB100 is the Department for Children, Schools and Families document on Fire safety in schools.

It basically underlines the requirements stated in ADB, requiring fire damper testing to BS EN 1366-2 and classification to BS EN 13501-3.

Regulatory Reform (Fire safety) Order (RRFSO)

This is the regulatory requirement that allows people to self fire certificate their buildings. There are requirements for keeping testing and maintenance records for all passive fire protection equipment, which includes fire dampers.

BS EN 15650

Fire Damper product standard. Ventilation for Buildings.

BS EN 1366-2

The fire resistance test standard for fire dampers.

BS EN 13501-3

Classification standard for fire dampers.

BS EN 1751

The standard for aerodynamically testing dampers. This includes casing leakage.

Other publications

DW 144 (HVCA)

This states the general requirements for HVAC ductwork, including the use of fire dampers. It also states ductwork leakage limits. Normal operating conditions - not exceeding 1000Pa, Classes A & B of DW 144 2016 Specification will apply.

DW 145 (HVCA)

This document will give guidance on the whole process of the selection and installation of fire dampers, with responsibilities and project planning etc.

The Grey Book (ASFP)

This gives further guidance on the application and installation of fire dampers.

Scotland

These are technical standards (AMD's). They give similar guidance to ADB. They already include direct references to the application of European standards. They are obtainable as a free download from the Scottish Executive website.

Typical Tender/Specification Text

Dampers to comply with EN15650.

For maintenance of the integrity of compartmentation the fire dampers shall have an E classification to EN 13501-3.

Folding blade (E class) fire dampers shall not be used for protection of escape routes and areas with sleeping risk.

Refer to Approved Document B (ADB).

The interlocking ribbed blades shall be held out of the airstream against constant force springs by a fusible link.

The fusible link shall have a melting temperature of 72°C. The link melting shall allow the springs to close the damper.

The fusible link assembly and bottom blade arrangement ring pull shall be installed so that test release may be made safely from either side of the damper.

The fire damper case shall be fully welded to meet the air tightness test requirements of HVCA. Normal operating conditions - not exceeding 1000Pa, Classes A & B of DW 144 2016 Specification will apply.

FD Series

Fire Dampers - Product Specification



Fusible Link Bracket

The Fusible Link Bracket is manufactured from galvanised steel as standard.

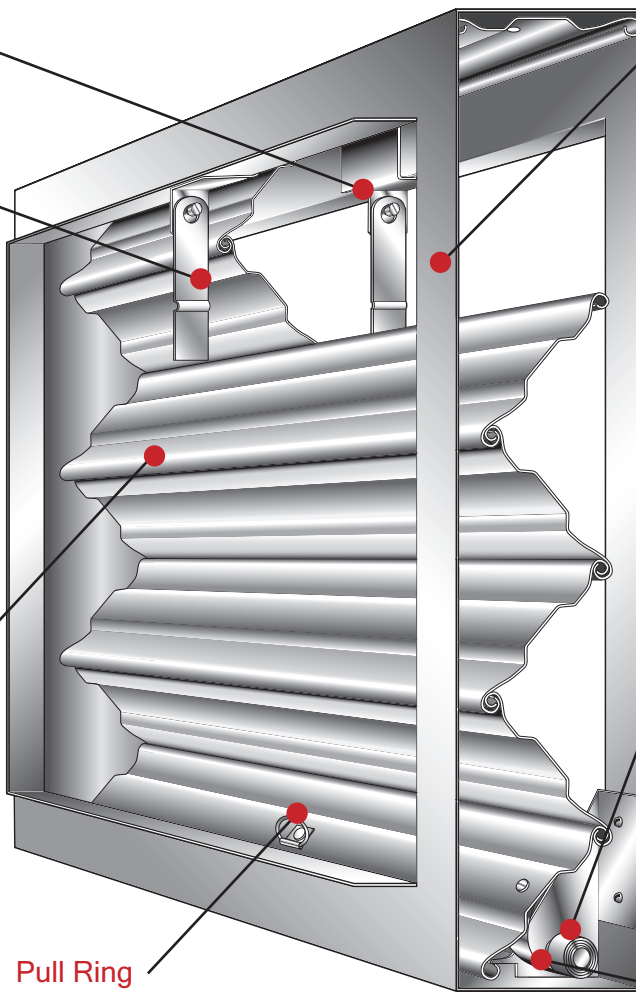
Fusible Link

Blades are held in the open position by a straight bar link (fitted as standard) rated at 72°C (162°F) with a formed reinforcing swage and two location holes.

Blades

Formed to provide a continuous interlocking hinge extending the full length with dual swages providing maximum strength and rigidity. Nominally 0.7mm (22swg) thick cold reduced hot dipped galvanised mild steel to BS EN 10346 Grade DX51D + Z275.

Blade material options to order are Ferritic 430 type 1.4016 grade or Austenitic 316 type 1.4401 grade to BS EN 10088-2.



Casing

Formed to provide two continuous internal flanges not less than 30mm. Casing and components not less than 1.2mm thick cold reduced hot dipped galvanised mild steel to BS EN 10346 Grade DX51D + Z275.

Casing material options to order are Ferritic 430 type 1.4016 grade or Austenitic 316 type 1.4401 grade to BS EN 10088-2.

Closure Springs

Dampers are supplied with two constant force coil springs exerting a pull of not less than 35N, with one end fixed to the leading blade by rivets and the coil fitted on the spindle of the locking ramp. The spring is manufactured from Grade 302 stainless steel to BS EN 10151.

Locking Ramps

Dual locking ramps ensure positive closing action of the blade pack in horizontal or vertical installations.

Paint

All welds are cleaned and sprayed with commercial grade water based protective paint.

Pull Ring

To aid resetting of the damper blade pack, the bottom closing blade will be fitted with a single pull ring centrally to the width for dampers up to and including 500mm wide or 500mm diameter. For all dimensions above this, two equally spaced pull rings will be fitted.

Gate Latch Release

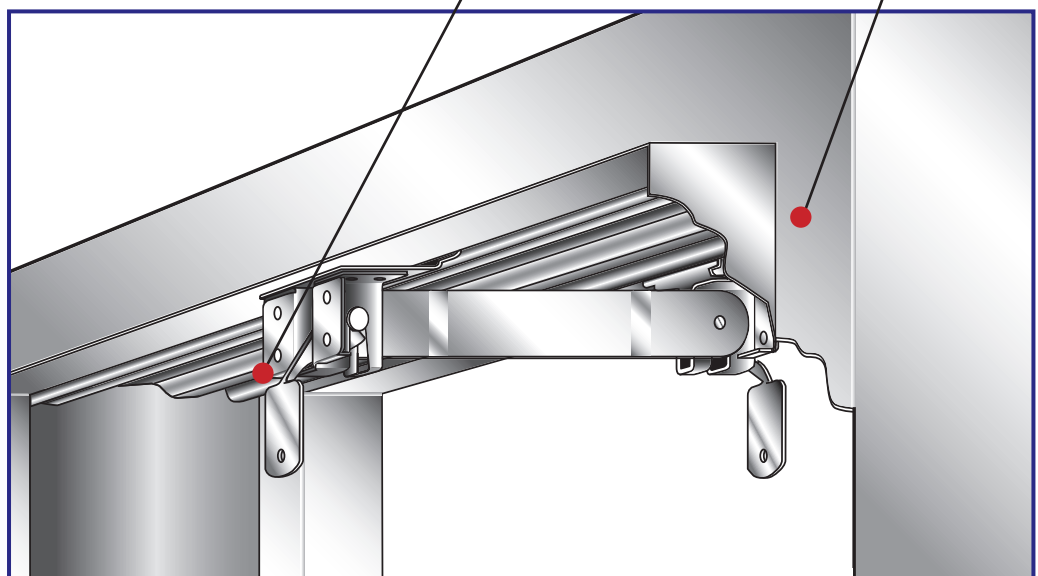
Optional mechanism for electrical release when required. Rated 72°C (162°F),

Microswitches

All BSB FD Fire Dampers are available with factory fitted single pole microswitches as optional extras. (See page 13)

Mechanical Visual Indicator

Local visual indication of the blade status is available as an optional extra. (See page 13)

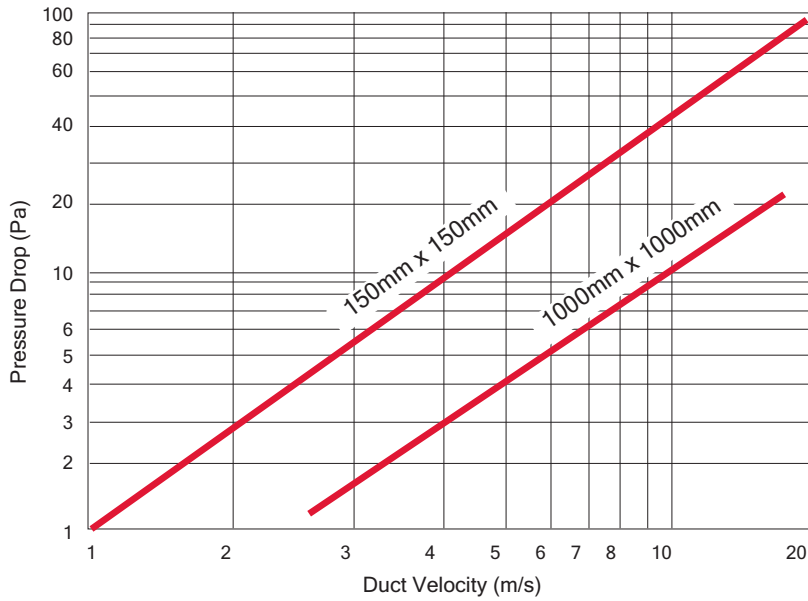




FD Series

Fire Dampers - Performance Data

Performance Data

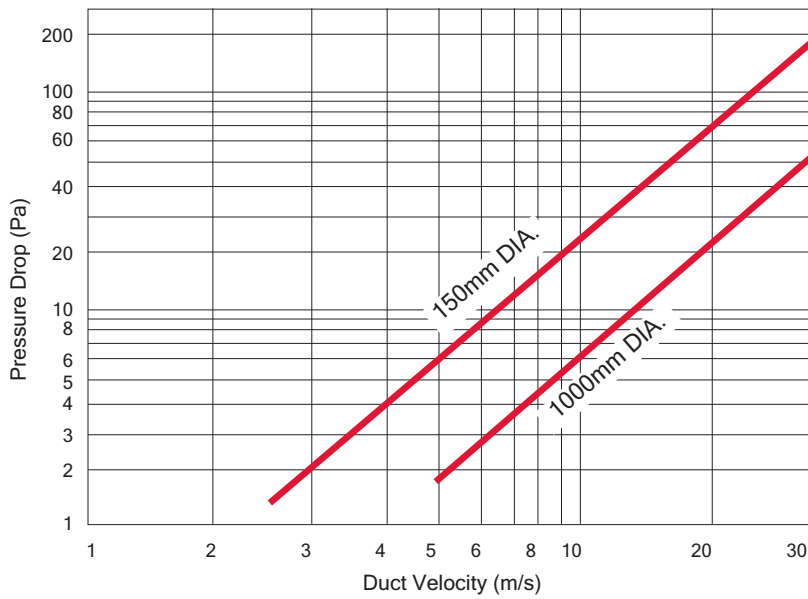


Pressure Drop Graph

Type A

Minimum free area = 91%

Velocity range 0 to 12.5 m/s

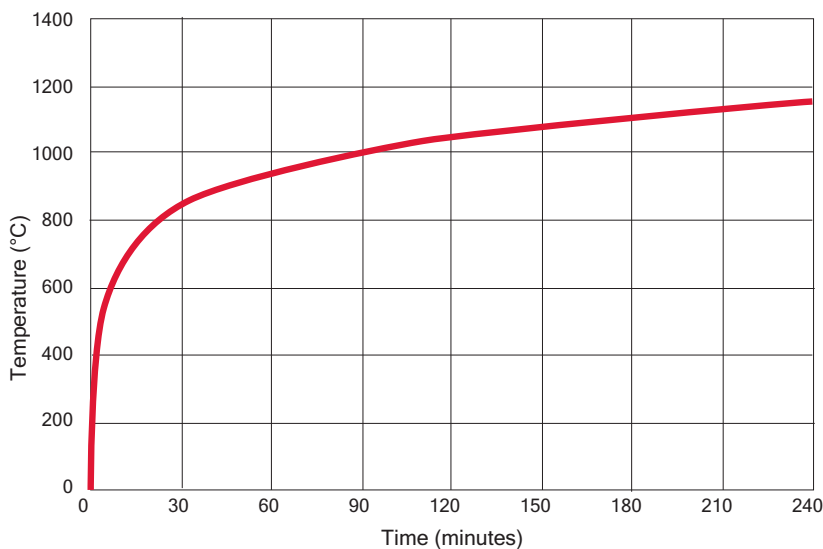


Pressure Drop Graph

Type B, Type C and Type O

Maximum unrestricted airflow

Velocity range 0 to 30 m/s

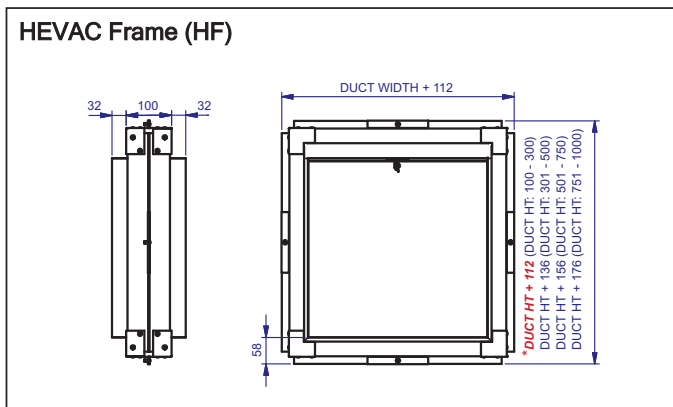
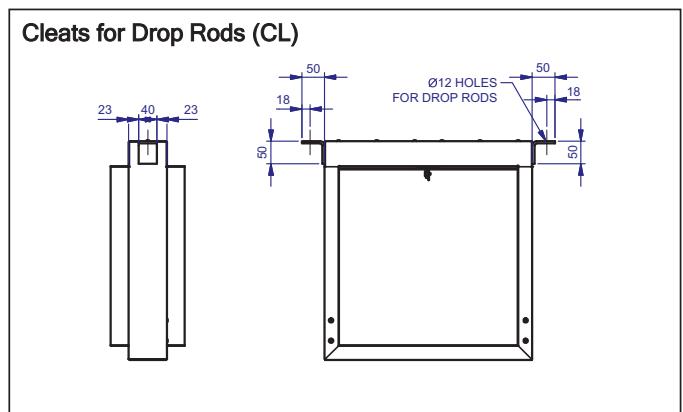
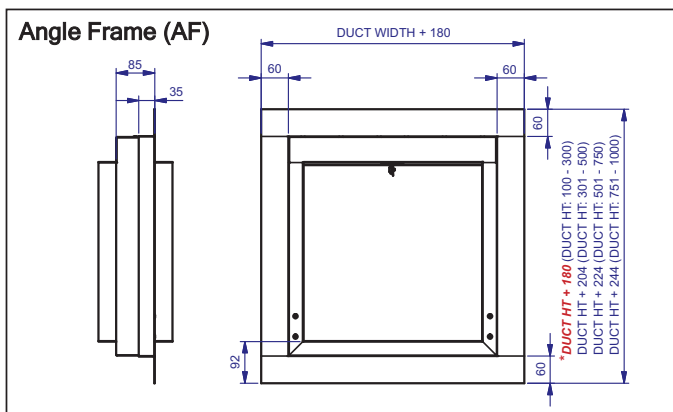
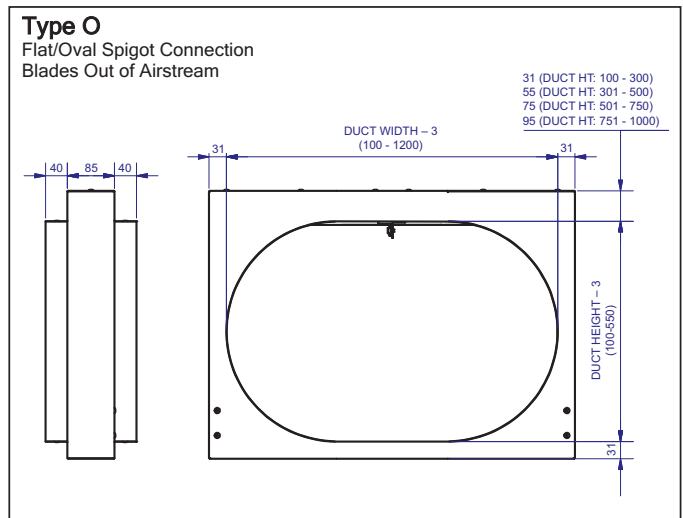
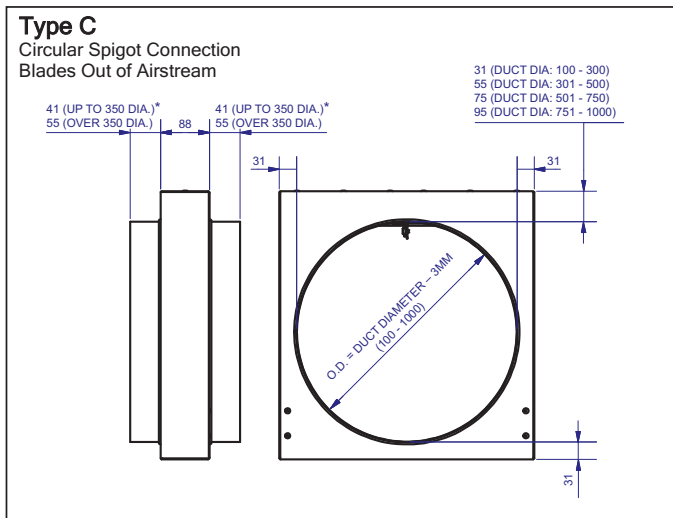
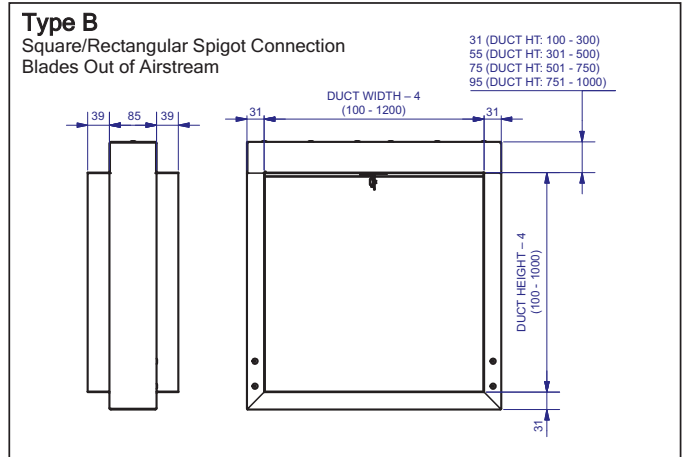
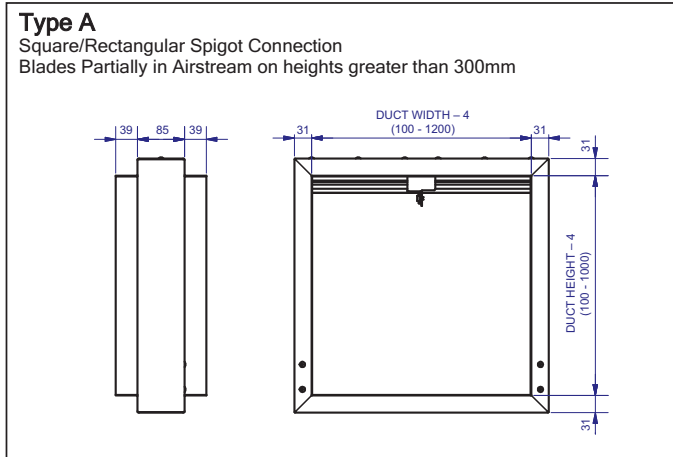


Standard Time/Temp. Curve (4 hours)

As specified in EN 1363-1

FD Series

Fire Dampers - Dimensions



- Notes:
1. All dimensions are in mm.
 2. Rectangular spigoted models are supplied with actual spigot dimensions nominal less 4mm ± 1mm.
 3. Circular and Flat Oval spigoted models are supplied with actual spigot dimensions nominal less 3mm ± 1mm.
 4. For sizes greater than detailed maximum sizes, multiple section units will be supplied.
 5. Where gate latches are fitted on dampers below 150mm in height or diameter release testing is only possible from opposite to ramp side. Please refer to our sales office.
 6. Dimensions with * apply for a type A damper at any height.

Fire Dampers - Angle Frame (AF) Installation Method

Angle Frame (AF) Installation Method

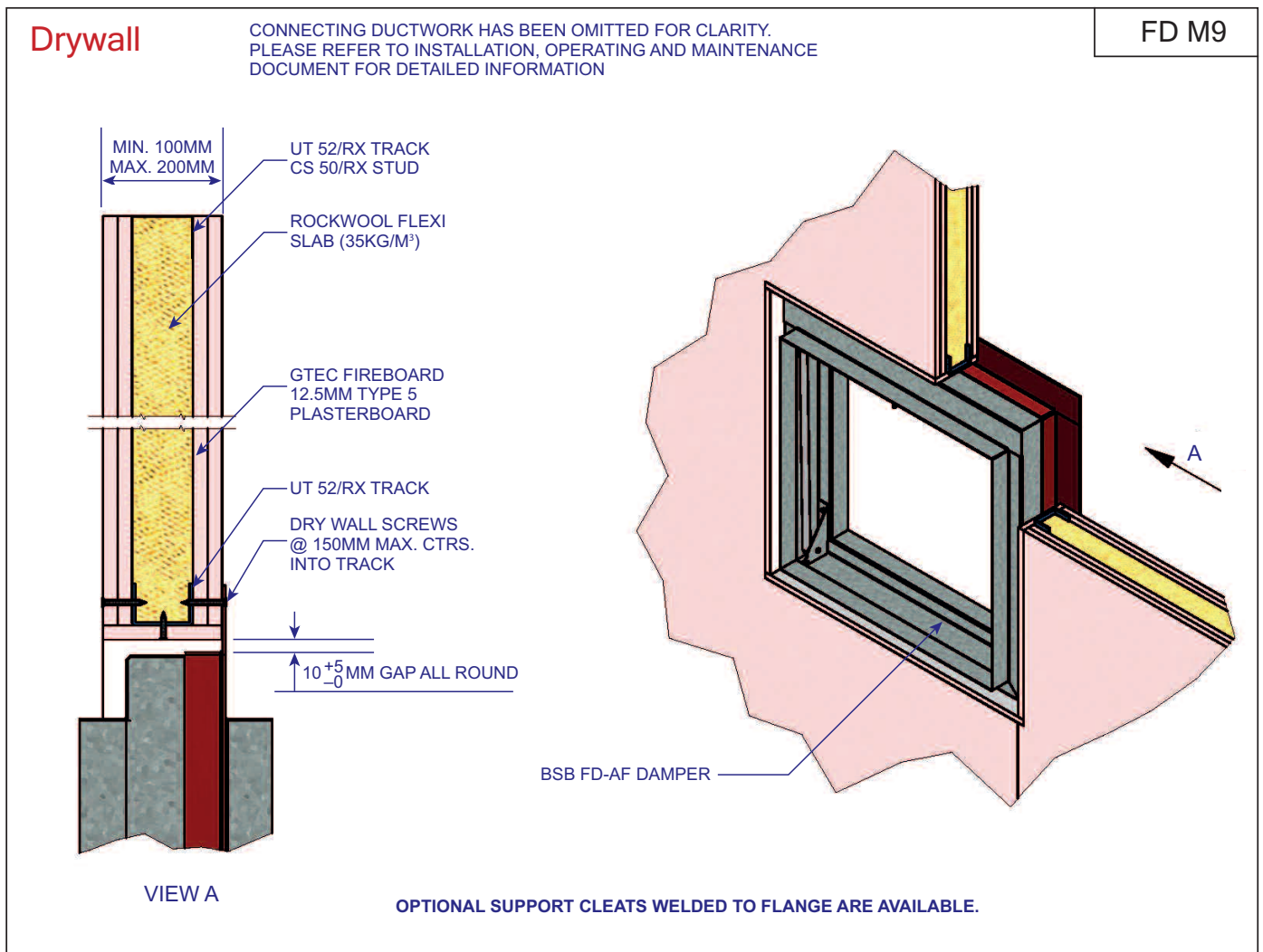
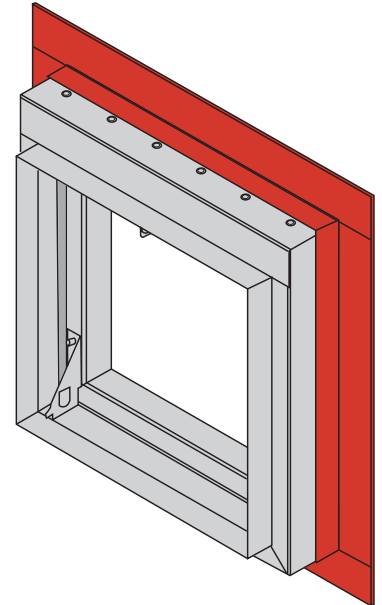
The Angle Frame (AF) method offers a comprehensive installation solution for masonry walls, partition walls and concrete floors. It is CE marked for both vertical and horizontal applications and has been fire tested vertically from both sides.

Dampers are supplied with a factory fitted 1.2mm thick welded 60mm galvanised steel angle to the damper case periphery.

Installation in masonry walls and concrete floors is effected without the need for backfilling with mortar around the damper casing.

Dampers in partition walls are installed without having to seal around the aperture with plasterboard on the non-framed side.

Cleats are available factory fitted to the front face of the AF fixing frame. The cleats should only be used where the fire separation element is not yet in place offering a temporary installation support. The cleats must not be the sole independent method of supporting the fire damper.



TESTED INSTALLATION METHOD SHOWN. DIFFERING INSTALLATION METHODS TO THIS, MUST BE APPROVED BY THE BUILDING CONTROL AUTHORITY (BCA) BEFORE PROCEEDING.	
BSB FD-AF ANGLE FRAME Fitted	120 MINUTES FIRE RESISTANCE E120 (ve i↔o)
Single section sizes(mm) 100 x 100 to 1200 x 1000	BS EN1366-2 TEST REFERENCE: 284776 AND 303868 BRE CERTIFICATE OF CONSTANCY 0832-CPR-P0006

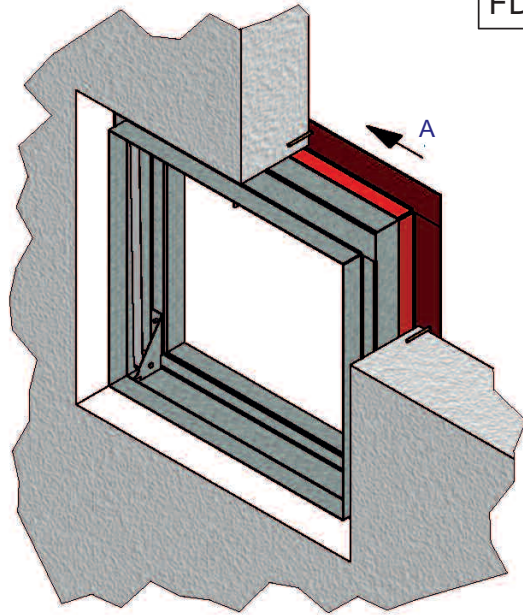
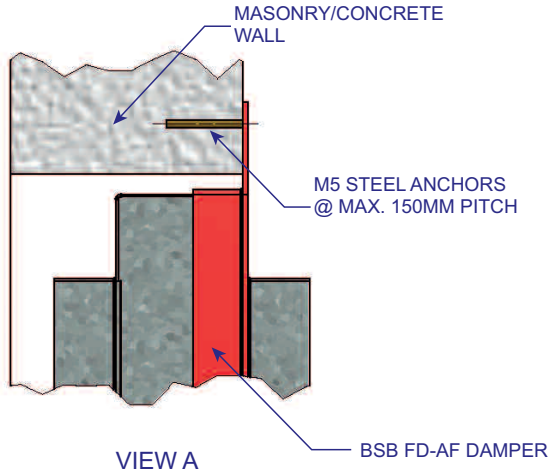
FD Series

Fire Dampers - Angle Frame (AF) Installation Method



Masonry Wall

CONNECTING DUCTWORK HAS BEEN OMITTED FOR CLARITY. PLEASE REFER TO INSTALLATION, OPERATING AND MAINTENANCE DOCUMENT FOR DETAILED INFORMATION



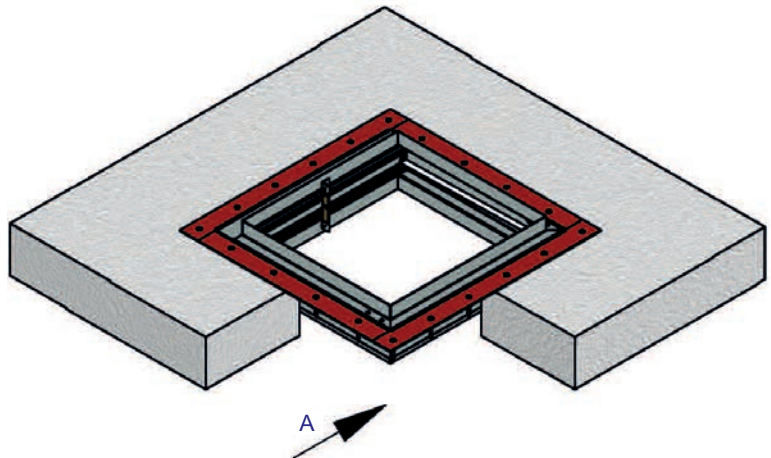
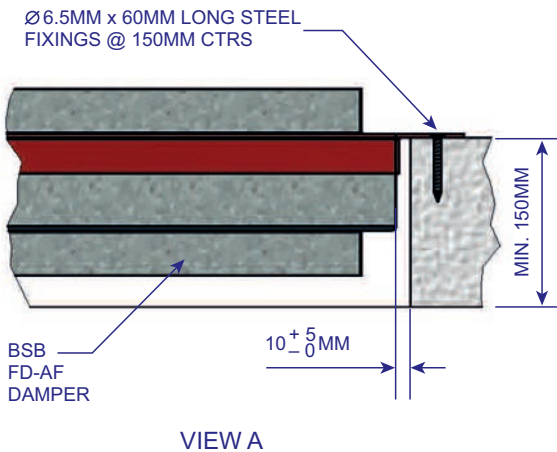
FD M10

TESTED INSTALLATION METHOD SHOWN. DIFFERING INSTALLATION METHODS TO THIS, MUST BE APPROVED BY THE BUILDING CONTROL AUTHORITY (BCA) BEFORE PROCEEDING.

BSB FD-AF ANGLE FRAME Fitted	CE 120 MINUTES FIRE RESISTANCE E120 (ve i ↔ o)
Single Section Sizes (mm) 100 x 100 to 1200 x 1000	BS EN1366-2 TEST REFERENCE: 284776 AND 303868 BRE CERTIFICATE OF CONSTANCY 0832-CPR-P0006

Concrete Floor

CONNECTING DUCTWORK HAS BEEN OMITTED FOR CLARITY. PLEASE REFER TO INSTALLATION, OPERATING AND MAINTENANCE DOCUMENT FOR DETAILED INFORMATION



FD M11

NOTE: THIS INSTALLATION WAS SUCCESSFULLY TESTED FOR 4 HOURS

TESTED INSTALLATION METHOD SHOWN. DIFFERING INSTALLATION METHODS TO THIS, MUST BE APPROVED BY THE BUILDING CONTROL AUTHORITY (BCA) BEFORE PROCEEDING.

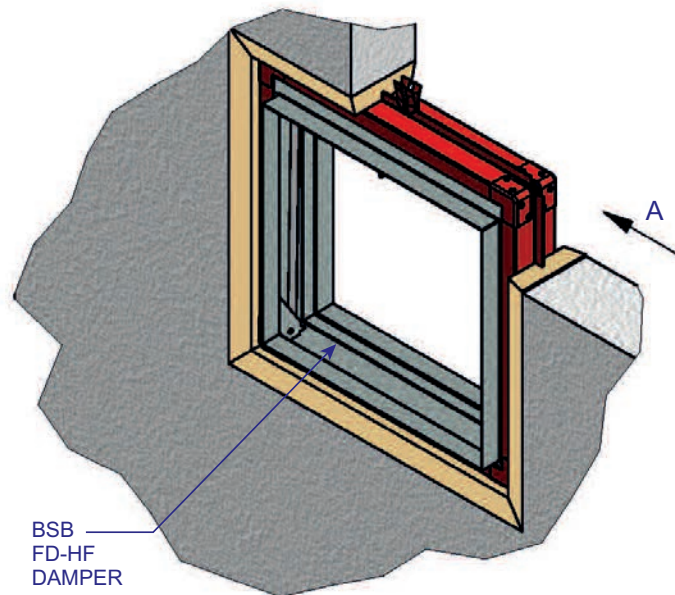
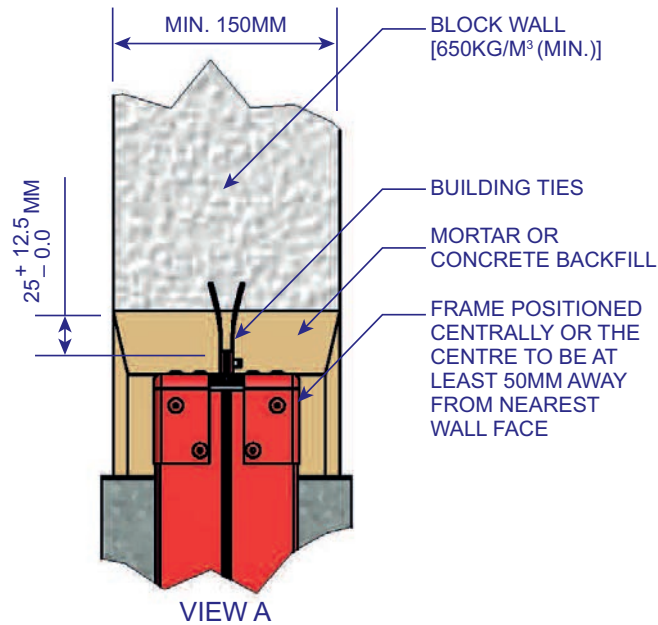
BSB FD-AF ANGLE FRAME Fitted	CE 120 MINUTES FIRE RESISTANCE E120 (ho i → o)
Single Section Sizes (mm) 100 x 100 to 1200 x 1000	BS EN1366-2 TEST REFERENCE: 282572 BRE CERTIFICATE OF CONSTANCY 0832-CPR-P0006

Block/Masonry Wall

CONNECTING DUCTWORK HAS BEEN OMITTED FOR CLARITY

FD M2

DW/145 M3



SECURING OF BUILDING TIES:

EITHER, CUT 150MM LONG X 50MM DEEP POCKETS INTO SURROUNDING CONSTRUCTION, BEND OUT TABS INTO POCKETS AND BACKFILL.

OR, USE 5MM DIA STEEL ANCHORS (MIN) AND 1.5MM DIA STEEL WIRE (MIN) AROUND BENT-OUT TABS & ANCHORS TO FIX TO SURROUNDING CONSTRUCTION, PRIOR TO BACKFILL.

NOTE: THIS INSTALLATION WAS SUCCESSFULLY TESTED FOR 4 HOURS

TESTED INSTALLATION METHOD SHOWN. DIFFERING INSTALLATION METHODS TO THIS, MUST BE APPROVED BY THE BUILDING CONTROL AUTHORITY (BCA) BEFORE PROCEEDING.

BSB FD-HF
HEVAC FRAME Fitted

CE 120 MINUTES FIRE RESISTANCE
E120 (ve i → o)

Single Section Sizes (mm)
100 x 100 to 1200 x 1000

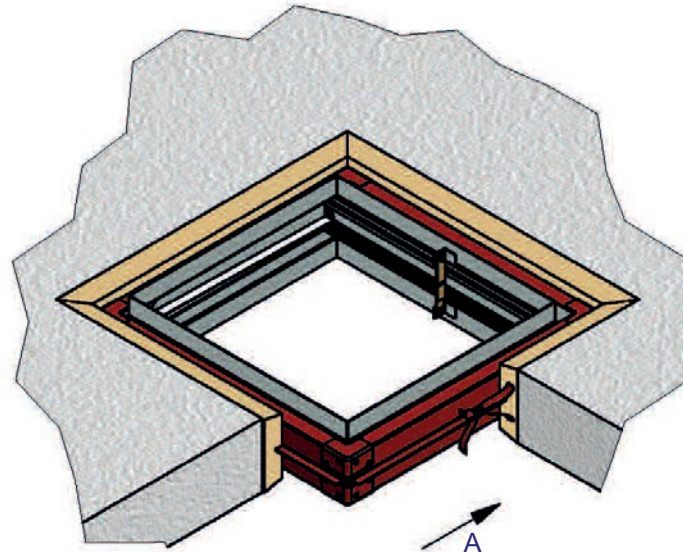
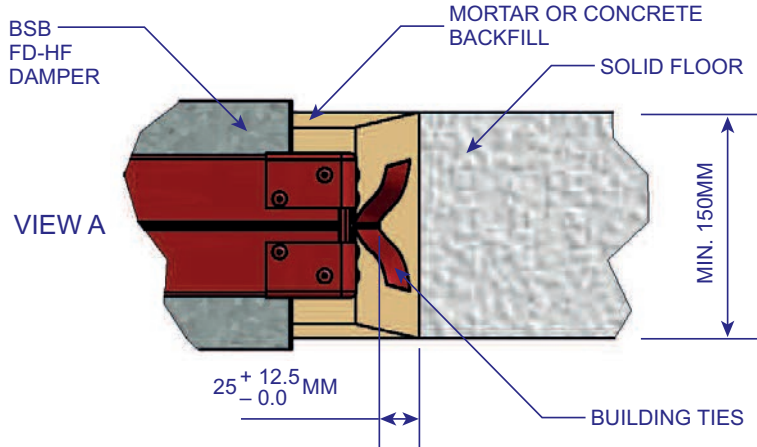
BRE CERTIFICATE OF CONSTANCY: 0832-CPR-P0006

Concrete Floor

FD M1

DW/145 M3

CONNECTING DUCTWORK HAS BEEN OMITTED FOR CLARITY.
PLEASE REFER TO INSTALLATION, OPERATING AND MAINTENANCE
DOCUMENT FOR DETAILED INFORMATION



SECURING OF BUILDING TIES:

- EITHER, CUT 150MM LONG X 50MM DEEP POCKETS INTO SURROUNDING CONSTRUCTION, BEND OUT TABS INTO POCKETS AND BACKFILL.
- OR, USE 5MM DIA STEEL ANCHORS (MIN) AND 1.5MM DIA STEEL WIRE (MIN) AROUND BENT-OUT TABS & ANCHORS TO FIX TO SURROUNDING CONSTRUCTION, PRIOR TO BACKFILL.

NOTE: THIS INSTALLATION WAS SUCCESSFULLY TESTED FOR 4 HOURS

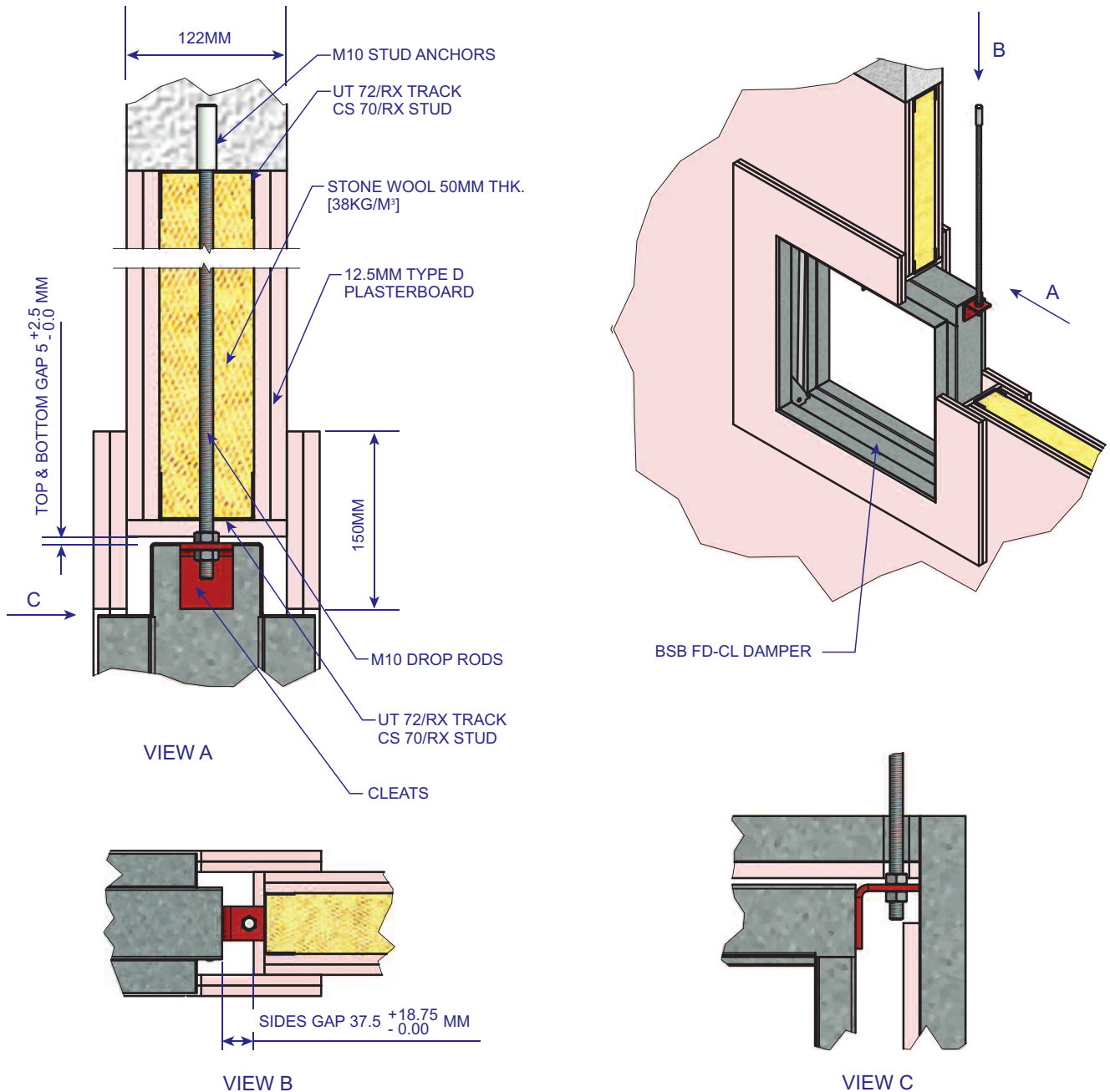
TESTED INSTALLATION METHOD SHOWN. DIFFERING INSTALLATION METHODS TO THIS, MUST BE APPROVED BY THE BUILDING CONTROL AUTHORITY (BCA) BEFORE PROCEEDING.

<p>BSB FD-HF HEVAC FRAME Fitted</p>	<p>CE 120 MINUTES FIRE RESISTANCE E120 (ho i → o)</p>
<p>Single Section Sizes (mm) 100 x 100 to 1200 x 1000</p>	<p>BRE CERTIFICATE OF CONSTANCY 0832-CPR-P0006</p>

FD M6-r5

Drywall

CONNECTING DUCTWORK HAS BEEN OMITTED FOR CLARITY. PLEASE REFER TO INSTALLATION, OPERATING AND MAINTENANCE DOCUMENT FOR DETAILED INFORMATION.



CLEATS:
THE INSTALLATION SHOWN REFERS TO A PATTRSS INSTALLATION METHOD WITH CLEATS FITTED AS AN ACCESSORY.

TESTED INSTALLATION METHOD SHOWN. DIFFERING INSTALLATION METHODS TO THIS, MUST BE APPROVED BY THE BUILDING CONTROL AUTHORITY (BCA) BEFORE PROCEEDING. THEY WILL NEED TO REFER TO THIS DOCUMENT AND ASSOCIATED FIRE TESTS / DOCUMENTS CONTAINED HEREIN IN ORDER TO CONSIDER APPROVAL.

BSB FD-CL

CE 120 MINUTES FIRE RESISTANCE
E120 (ve i → o)

Single section sizes(mm)
100 x 100 to 1200 x 1000

BS EN1366-2 TEST REFERENCE: 258320
BRE CERTIFICATE OF CONSTANCY 0832-CPR-P0006

FD Series

Fire Dampers - Fusible Link Release and Multiple Assemblies



Fusible Link Release

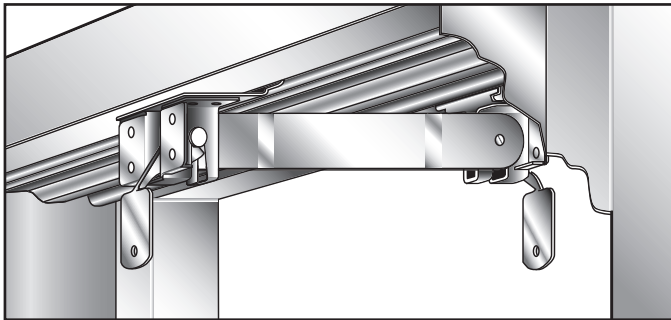
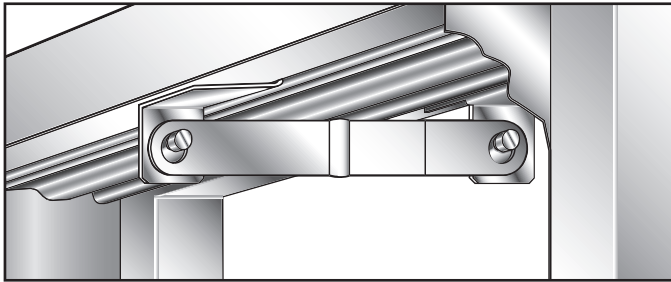
Straight Bar Fusible Link (Standard)

The standard fusible link will be supplied and rated at 72°C unless otherwise specified.

Gate Latch Link Option

Providing a trigger operation feature, this self-locating and easily resettable cassette can be used with either the solenoid or electro-magnet controls - or, as a standard component to assist the engineer in the resetting of the fire damper during regular inspection and maintenance procedures.

Below 150mm in height or diameter release testing only possible from opposite to ramp side.



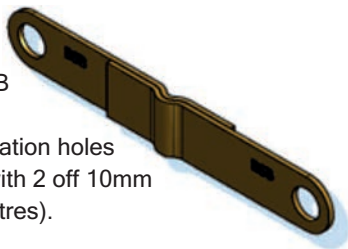
BSB FD series folding blade fire dampers are supplied with fusible links rated and designed to operate at 72°C as standard.

Fire dampers fitted with links rated at any other temperature other than 72°C will not be CE marked.

Replacement links for existing fire dampers will need to match the type of link bracket that has been supplied (please see below). If in doubt, please refer to our Sales Office.

Standard Link (LS)

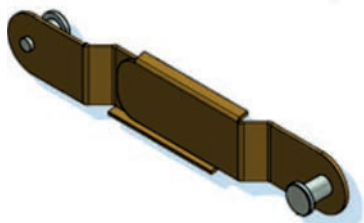
Supplied as standard, the BSB straight bar link has a formed reinforcing swage and two location holes (125mm long x 18mm wide, with 2 off 10mm diameter holes at 107mm centres).



Gate latch Link (LG)

Used with the Gate latch release mechanism to assist the engineer in testing and resetting of fire dampers during routine inspection and maintenance procedures

(120mm long x 23mm wide, with 2 off 10mm diameter bosses at 103mm centres).



Multiple Assemblies

FD Series dampers can be supplied in multiple module sections to achieve requested sizes larger than the maximum manufactured single module units.

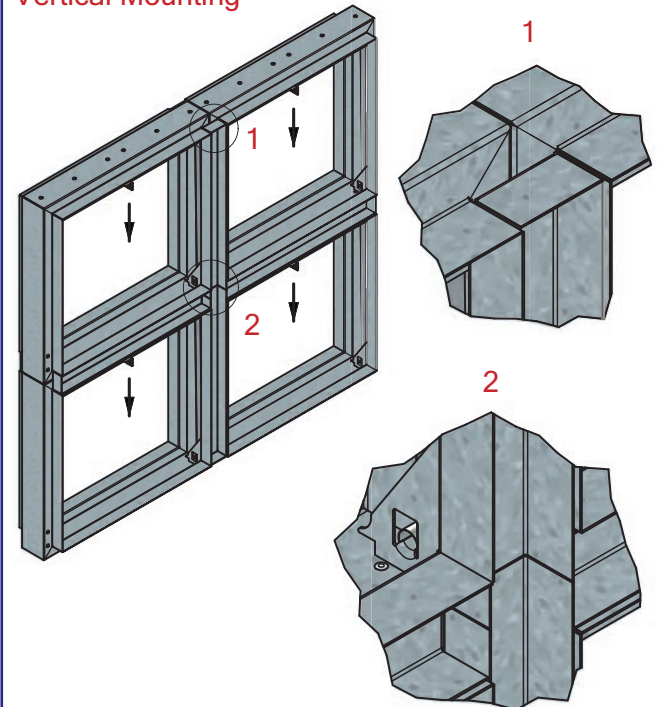
Such units and their installation method must be approved by the BCA before installation. For this, consideration must be given to additional structural steelwork that might be needed to support the weight of the damper. BSB cannot offer or approve supporting structures for multiple assemblies.

Illustrated are several variants of multiple module arrangements.

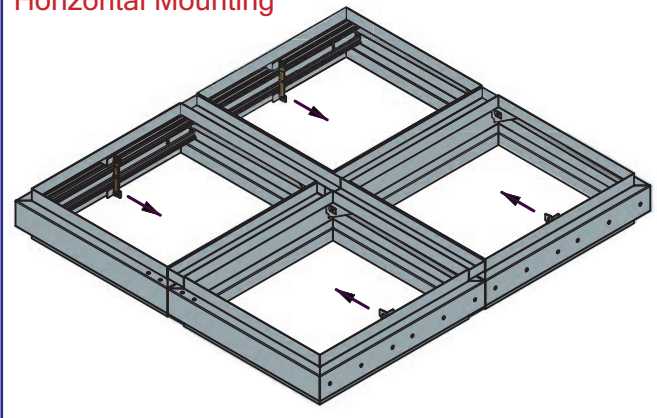
When there are transportation restrictions, large multiple units will be shipped in individual sections for site assembly by others. Joining strips are supplied un-drilled unless requested otherwise. Large multiple units required to be shipped fully assembled will incur additional packing/shipping costs. Please contact our sales office for further information.

BSB can manufacture to individual specifications and applications. Illustrated are standard variants with other variants available to order.

Vertical Mounting

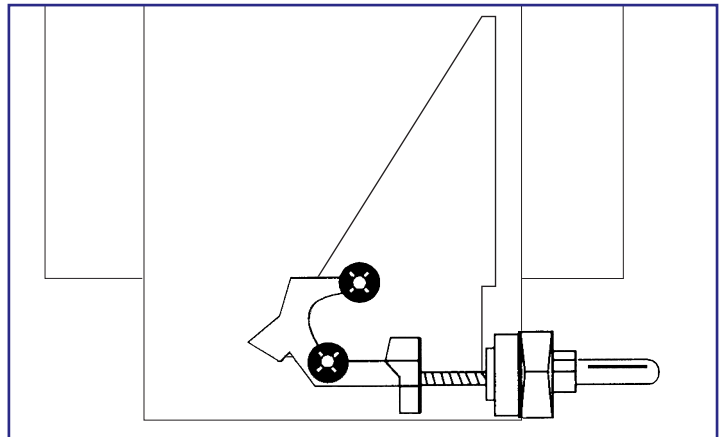


Horizontal Mounting



Mechanical Visual Indicator

To provide local indication of the blade status.
When the indicator appears in the bulb, this shows that the blades are closed.



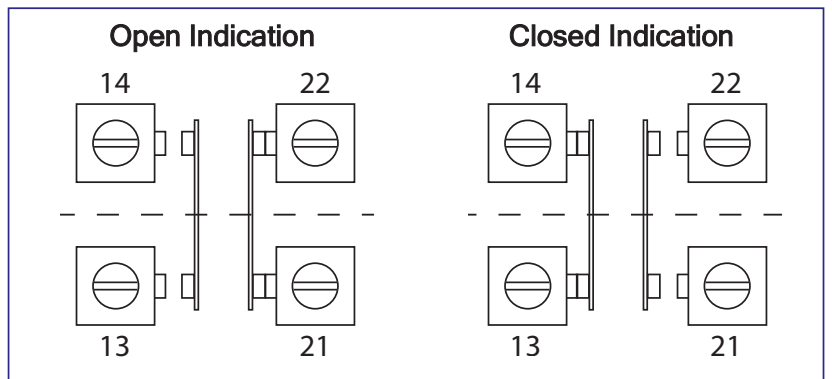
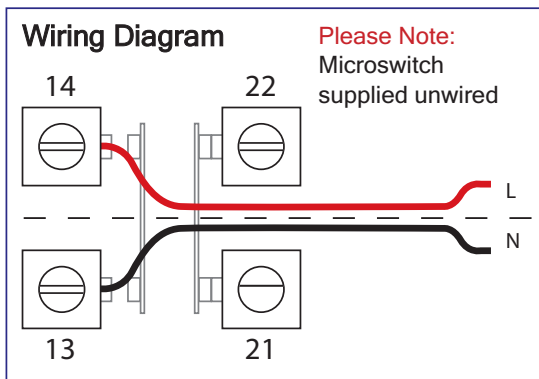
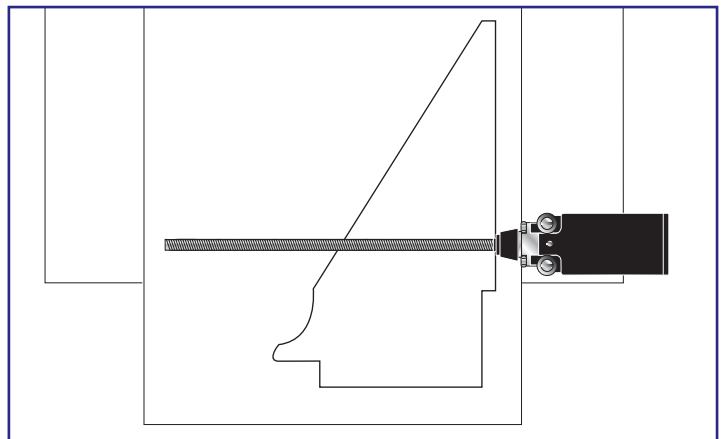
Single Pole Microswitch

To provide remote indication of the blade status. As the leading blade travels close towards the locking ramp, it makes contact with the arm and operates the change over switch to provide a remote closed signal.

The Single Pole Microswitch is supplied as a dependent snap action contact 1NO + 1NC.

For indication of damper closed, terminals 13 and 14 should be used.

Degree of protection: IP66.



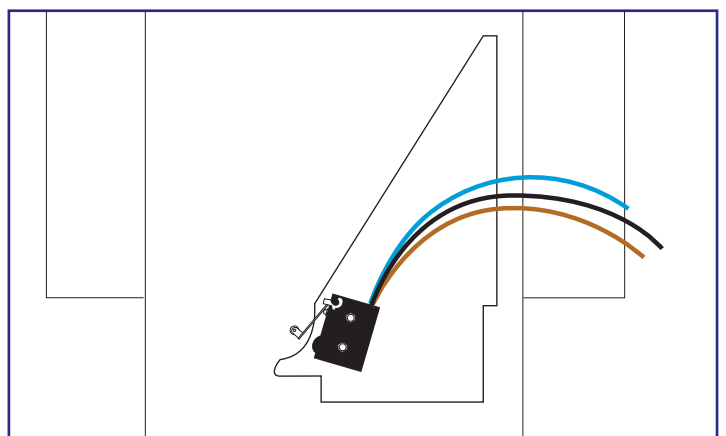
V4 Sealed Microswitch

To provide remote indication of the blade status. As the leading blade travels over the locking ramp, the lever is depressed and operates the switch. Factory fitted.

Degree of protection: Casing and Outlet IP67
Lead Length: 460mm

Connection details:

- Common (1) Black lead
- Normally open (4) Blue lead
- Normally closed (2) Brown lead



FD Series

Fire Dampers - Weight Charts



Weight Chart (kg approx.)

Height (mm)	Width (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	2.0	2.5	3.0	4.0	4.5	5.0	5.5	6.5	7.0	8.0	8.5	9.0
200	2.5	3.0	4.0	4.5	5.0	6.0	6.5	7.5	8.0	9.0	9.5	10.5
300	3.0	4.0	4.5	5.5	6.0	7.0	8.0	9.0	9.5	10.5	11.0	12.0
400	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5
500	4.5	5.5	6.5	7.5	8.5	9.5	10.5	12.0	13.0	14.0	15.0	16.0
600	5.0	6.0	7.5	8.5	9.5	11.0	12.0	13.5	14.5	16.0	17.0	18.5
700	5.5	6.5	8.0	9.0	10.5	11.5	13.0	14.5	15.5	17.0	18.0	19.5
800	6.0	7.5	9.0	10.5	11.5	13.0	14.5	16.0	17.5	19.0	20.5	21.5
900	6.5	8.0	9.5	11.0	12.5	14.0	15.5	17.5	19.0	20.5	22.0	23.5
1000	7.0	9.0	10.5	12.0	13.5	15.0	17.0	18.5	20.5	22.0	23.5	25.0

Weight Chart Circular (kg approx.)

Nom. dia. (mm)	Width (mm)		
	FDC	FDC+HF	FDC+AF
100	1.5	3.5	3.0
150	2.5	4.5	4.0
200	3.0	5.5	4.0
250	3.5	6.5	5.0
300	4.5	7.5	6.0
350	6.5	10.0	8.0
400	8.0	11.5	10.0
450	9.0	13.5	11.0
500	10.5	15.0	13.0
550	12.0	17.0	15.0
600	13.5	19.0	16.0
650	15.0	21.0	18.0
700	16.5	22.5	20.0
750	18.0	24.5	22.0
800	20.5	27.5	24.0
850	22.5	29.5	26.0
900	24.5	32.0	28.0
950	26.5	34.5	31.0
1000	28.5	37.0	33.0

Weight Chart + Hevac Frame (kg approx.)

Height (mm)	Width (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	3.5	4.5	5.5	6.5	7.5	8.5	8.5	11.0	12.0	13.0	14.0	15.0
200	4.5	5.5	6.5	7.5	8.5	10.0	11.0	12.0	13.5	14.5	15.5	16.5
300	5.5	6.5	8.0	9.0	10.0	11.5	12.5	14.0	15.0	16.0	17.5	18.5
400	6.5	8.0	9.0	10.5	11.5	13.0	14.5	16.0	17.5	18.5	20.0	21.5
500	7.5	9.0	10.5	11.5	13.0	14.5	16.0	17.5	19.0	20.5	22.0	23.5
600	8.5	10.0	11.5	13.0	14.5	16.5	18.0	19.5	21.5	23.0	24.5	26.0
700	9.5	11.0	12.5	14.0	15.5	17.5	19.0	21.0	22.5	24.0	26.0	27.5
800	10.5	12.0	14.0	15.5	17.5	19.0	21.0	23.0	24.5	26.5	28.5	30.0
900	11.5	13.0	15.0	17.0	18.5	20.5	22.5	24.5	26.5	28.5	30.5	32.5
1000	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.5	30.5	32.5	34.5

Weight Chart + Angle Frame (kg approx.)

Height (mm)	Width (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	2.5	3.5	4.5	5.0	6.0	6.5	7.5	8.5	9.5	10.0	11.0	12.0
200	3.5	4.5	5.0	6.0	7.0	7.5	8.5	9.5	10.5	11.5	12.5	13.0
300	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
400	5.0	6.0	7.5	8.5	9.5	10.5	11.5	13.0	14.0	15.5	16.5	17.5
500	6.0	7.0	8.5	9.5	10.5	12.0	13.0	14.5	16.0	17.0	18.5	19.5
600	6.5	8.0	9.5	11.0	12.0	13.5	15.0	16.5	18.0	19.5	20.5	22.0
700	7.5	9.0	10.0	11.5	13.0	14.5	16.0	17.5	19.0	20.5	22.0	23.5
800	8.0	10.0	11.5	13.0	14.5	16.0	17.5	19.5	21.0	22.5	24.0	26.0
900	9.0	10.5	12.5	14.0	15.5	17.5	19.0	21.0	22.5	24.5	26.0	27.5
1000	10.0	11.5	13.5	15.0	17.0	18.5	20.5	22.5	24.5	26.0	28.0	29.5

Fire Dampers - Testing and Maintenance

It is a requirement for fire protection systems to be regularly inspected, tested and maintained. As integral components of such systems, BSB FD Series fire dampers should be subjected to a planned maintenance programme.

In accordance with BS 9999 Annex W.1, inspection should be undertaken every year, though local regulations may override this, with periodic inspection being carried out more frequently where corrosive or dirty conditions prevail.



BSB recommend a maximum of one year between inspections. We also recommend that inspections begin more frequently and are only reduced to one year if conditions are proven to allow. The maintenance log should be reviewed at each inspection and the frequency adjusted as required dependent upon findings.

Testing and resetting will need to be undertaken through an access panel. The internal damper elements will need to be checked for corrosion, obstructions and accumulated dirt/dust. Cleaning should be undertaken using a soft cloth with a light application of light lubricant. Only a thin film of lubricant should be applied.



Please refer to our Operation and Maintenance details for further information and instructions for drop testing.

A regular test and maintenance programme will extend the working life of the fire safety system.

BSB are pleased to offer a comprehensive fire damper maintenance service. Please contact our Sales Office for details.

FD Series dampers are designed for normal dry filtered air systems and should be included within a programme of planned inspections.

Records of each damper installation and location are recommended and should include the condition of the dampers at each inspection with any action taken recorded and kept in an accessible location, as these products come under the requirements of the Regulatory Reform (Fire safety) Order (RRFSO).

Inspection and maintenance programmes may need to be repeated more regularly if the dampers are exposed to inclement and dusty conditions or fresh air intakes where the frequency of such checks should be developed based on site experience.

Special Note:

All fire damper installations should be carried out to the satisfaction of the appropriate district surveyor, fire officer, building control authority and/or specifying authority as other approved methods of installation may well be used.

Installation Parameters

FD Series Fire Dampers are designed for application in normal dry filtered air systems. If exposed to fresh air intakes and/or inclement conditions the damper should be subject to a planned inspection programme.

Installations involving corrosive and/or aggressive hostile environmental conditions (e.g. swimming pools) may invalidate our warranty and should be referred to our Sales Office.

Separation between fire dampers and between fire dampers and construction elements

In accordance with EN 1366-2 and the direct application rules, where two fire dampers are installed side by side within a fire separating element. There must be 200mm clear separation between damper casings.

Dampers installed must also be a minimum of 75mm between the damper casing and the construction element.

Please refer to EN 1366-2 section 13.6.

Storage

Dampers received on site should be stored in a purpose made storage area, where they can be protected from moisture, dust and impact damage until required.

Recycling

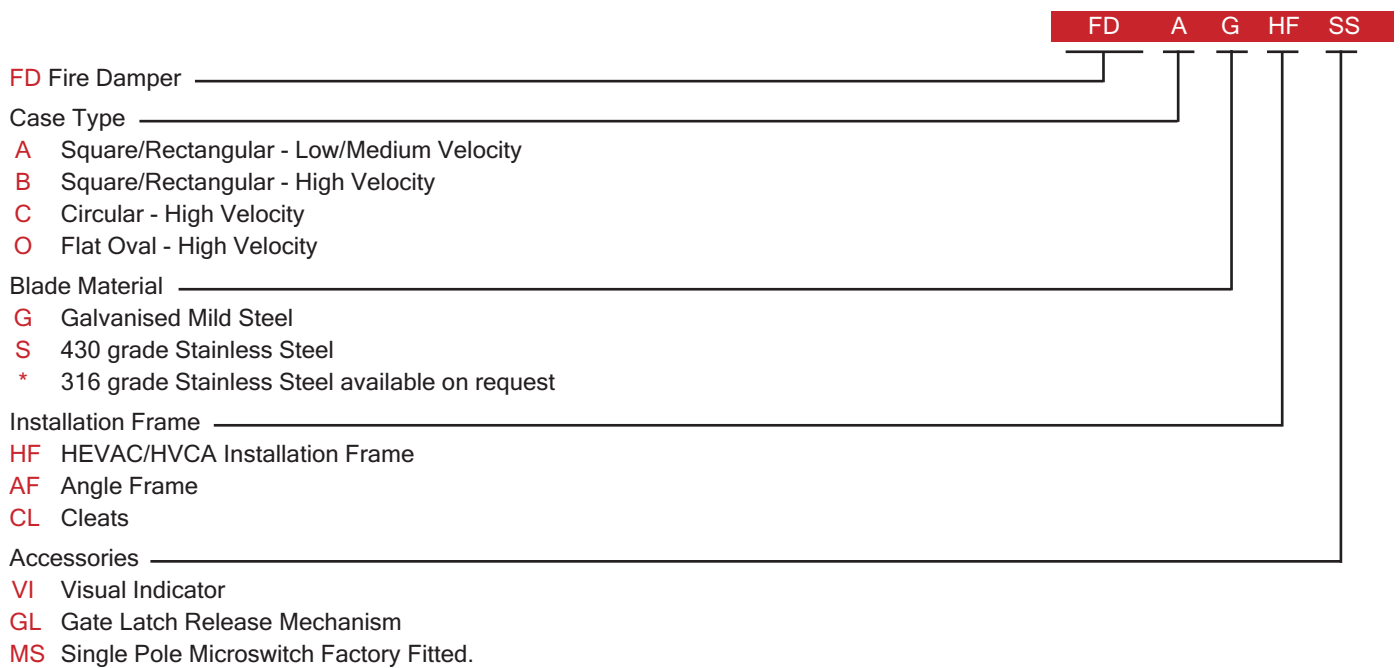
BSB recognises the need to preserve resources and reduce emissions and are actively working towards and introducing more efficient ways of manufacturing.

BSB supports and recommends that good waste management practice be adopted on all new and refurbishment projects, regardless of size. This not only reduces emissions, preserves raw materials and saves energy, but also reduces costs long term.

BSB are proud that their dampers are 95% minimum recyclable.

FD Series

Fire Dampers - Ordering Codes



Other Air, Fire and Smoke Control Products in the BSB Range:



For full details of the complete BSB Product Range, please refer to our individual product brochures, sales office or website.

BSB Engineering Services Limited

Unit 56, Trinity Trade Centre, Mill Way, Sittingbourne, Kent ME10 2PD, UK • Tel: +44 (0)1795 422609

For purchase orders and order related enquiries, please email: orders@bsb-dampers.co.uk

For pricing, technical and general enquiries, please email: enquiries@bsb-dampers.co.uk

Website: www.bsb-dampers.co.uk • A member of the Maico group

BSB Engineering Services Ltd. reserves the right to modify or withdraw any specification without prior notice that may result from continuous product development. The information contained within this brochure is correct at the time of going to press. (FD-04-2019)



FD-C Damper Installation, Operating & Maintenance Instructions

1. Storage

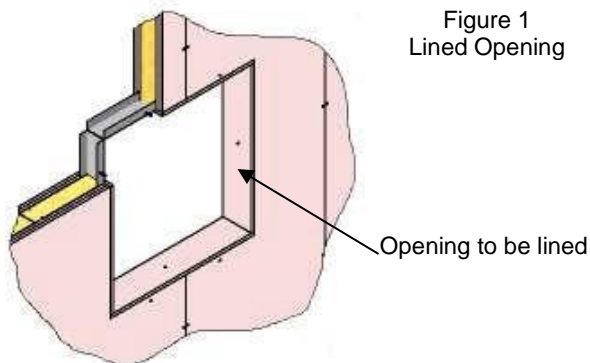
- 1.1 Dampers received on site should be stored in a purpose made storage area, where they can be protected from moisture, dust and impact damage until required. Dampers are designed for installation within internal normal dry filtered H&V systems.

2. Health and Safety

- 2.1 Only competent personnel may carry out the work outlined in this document.
- 2.2 Wear appropriate Personal Protective Equipment as required for safe working conditions and as site rules dictate.
- 2.3 Do not introduce fingers across the open blade or near to the spring loaded handle when releasing.
- 2.4 Where dampers are only accessible with the need for additional elevation, any equipment used should be done so with due consideration to the Work at Height regulations 2005 and current site rules.

3. Important

- 3.1 These instructions should be read in their entirety before commencing work. The installer must be familiar with the fire separating element construction detail that is produced by that particular manufacturer, and the "as tested" damper installation method, as appropriate for that fire separation barrier.
- 3.2 Do not over-tighten Fusible Link (FL). Do not force handle when FL assembly is set. Refer to sections 10 and 11 for testing.
- 3.3 Check internally that any debris has been removed and ductwork is connected. If set and locked open before installation, rough handling of the casing on larger sizes can cause the fusible link mechanism to actuate and close the damper. For existing dry walls – When cutting the opening for damper, and (partial) removal of stud is unavoidable, ensure the structure is sufficiently supported to conform to design specification.
- 3.4 Dry wall openings must be lined. Please see figure 1.



- 3.5 Ensure that appropriate 'fire-rated' plasterboard is used throughout the construction of drywall partitions that need to act as fire-barriers. Ductwork to be fitted and connected in accordance with DW 144 / DW145. Aluminium rivets should be used (to act as breakaway-joint). If fire resisting ductwork is being fitted to the dampers use the appropriate tested fire resisting fastenings. The use of Tec Screws is not recommended.
- 3.6 In accordance with TR/19 and B&ESA DW144 and DW145 access doors/panels/flexi-duct should be fitted adjacent to the damper to allow commissioning, servicing and cleaning. Access doors should not be obstructed.
- 3.7 All installations are subject to local Building Control Approval (BCA). Tested Installations are detailed herein. If the proposed installation deviates to that shown, acceptance from BCA should be sought before proceeding.
- 3.8 Refer to main product brochure for full details and specification.
- 3.9 Where more than one duct penetrates a wall or floor, adjacent fire damper assemblies should be separated by a structural element with a minimum width of 200mm (to comply with BS EN1366-2. Sec'n 13.6), Exceptions to this are Ablative Batt penetration installations that also allows for overlapping plates.

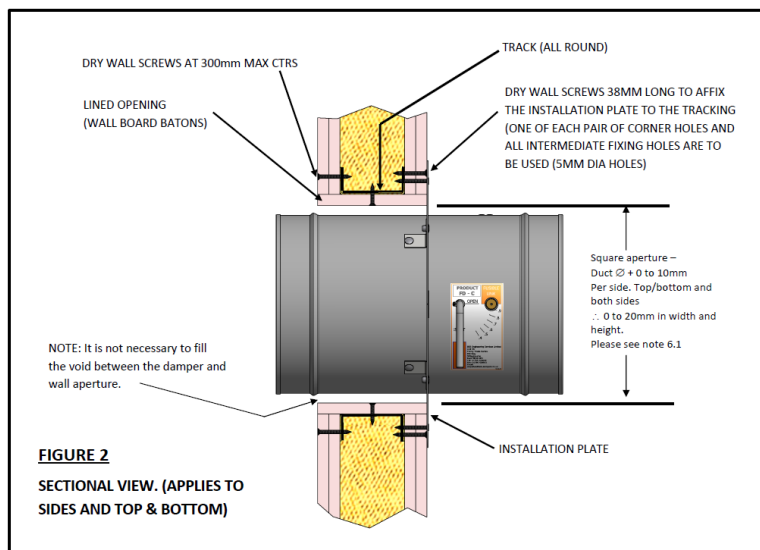
4. Equipment required

- 4.1 Equipment and tools will vary dependent upon the fire barrier construction that the damper is being installed within. Standard equipment that are normally used for the building of the particular barrier should suffice.
- 4.2 Access-equipment as necessary (steps or platforms).
- 4.3 Cordless drill and various dia. drill bits / drivers to suit Installation Plate fixings, and duct connection fixings.

5. Preparation for Installation and General Notes

- 5.1 Before installation, the damper should be inspected to ensure that it has not been damaged and is in good condition following transportation and/or storage.
- 5.2 Check damper reference and size to site specification.
- 5.3 The damper is supplied with blade in the closed position and the Fusible Link held in place by orange transit tape.
- 5.4 Remove the tape. Unscrew fusible link (FL) anti-clockwise a couple of turns.
- 5.5 Perform quick test to check damper opens and self closes keeping fingers away from moving blade/handle.
- 5.6 Where more than one duct penetrates a wall or floor, adjacent fire damper assemblies should be separated by a structural element with a minimum width of 200mm (to comply with BS EN1366-2 sec'n13.6). Exceptions to this are Ablative Batt penetration installations that also allows for overlapping plates.
- 5.7 Install damper to site specification details and building codes of practice. (Refer to Tested Installation Methods contained herein).
- 5.8 Ensure that the ductwork is to be independently and adequately supported.
- 5.9 Note: All Fire / Smoke Damper installations must be carried out to the satisfaction of the appropriate Building Control Officer and/or specifying authority.
- 5.10 The installation method contained herein assumes the wall has been built prior to the damper opening preparation. Optionally, the opening may already be present, in which case verify suitability, size and position accordingly.
- 5.11 Determine required position of damper. Check sufficient space exists to fit the product. Ensure any services (e.g. electrical/plumbing) within the structure or running close to the structure will not be affected. If existing stud/track is avoidable, ensure the structure is sufficiently supported to conform to design specification and that the opening is lined.
- 5.12 Where the structure is deeper than the casing length it may be necessary to connect ducting to the non-access side of the damper through the opening, before final fitting of the damper. Once this is done, slide the damper and ductwork assembly back through the opening until the Installation Plate butts up to the structural surface ready to be fixed.

Tested Installation Methods

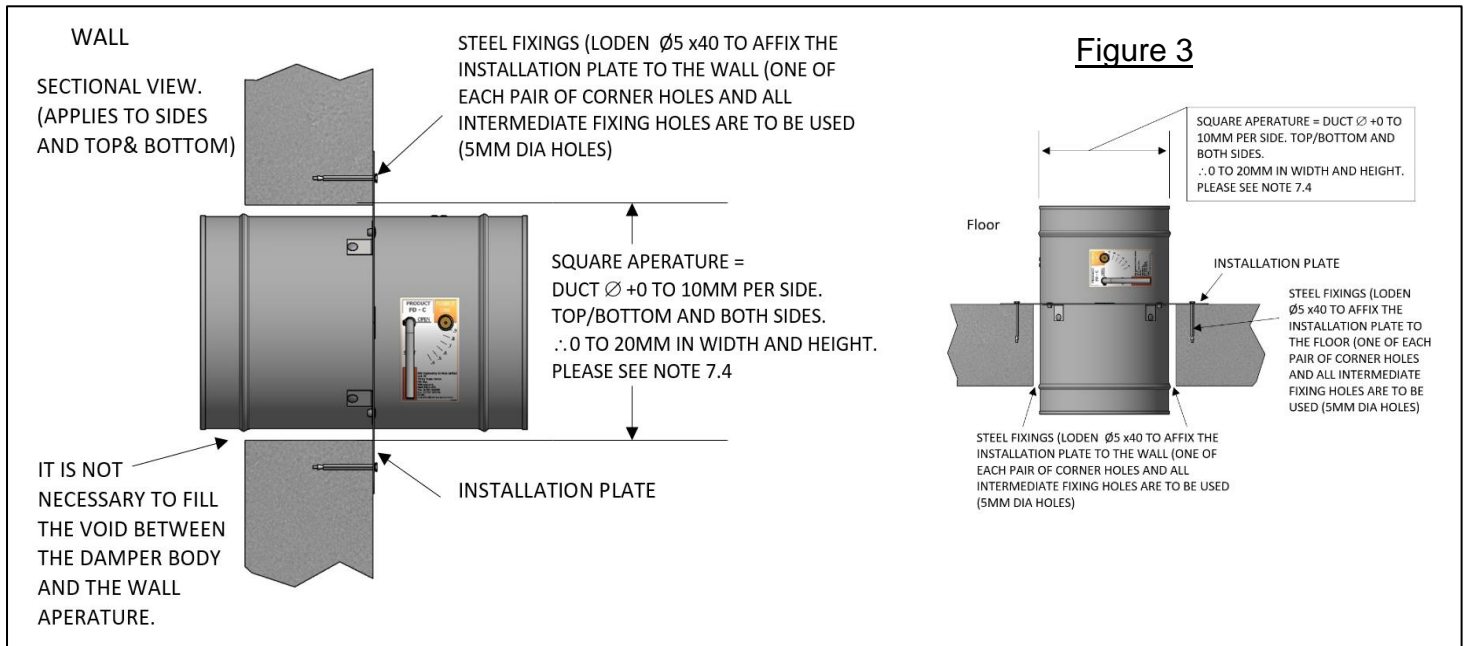


6. Dry wall Installation Procedure (refer to figure 2)

- 6.1 Finished aperture size is to be square and 20mm larger than the nominal damper diameter. This leaves 10mm nominal gap all round.
- 6.2 Preferably, prepare opening whilst building wall, or cut opening if wall already exists.
- 6.3 The hole must be 'lined out'.
- 6.4 Cut size = damper size + (2 x nominal gap size) + (2 x wall board thickness). See Fig 2.

- 6.5 e.g. for 150mm dia. damper, and 12.5mm wall board, cut hole should be 195mm (150+(2x10)+(2x12.5))
- 6.6 Mark out position and size of required cut size on the wall.
- 6.7 Using appropriate means, cut the hole in the wall and line opening by adding track and batons (fig 1).
- 6.8 Check opening size is correct.
- 6.9 Position damper centrally in opening and fix Installation Plate to wall using drywall screws of sufficient length to engage with track.
- 6.10 ALL Ø5mm fixing holes, except the 4 off unused corner fixings must be used.
- 6.11 Install from ONE side. There is no need to fill void or add pattress on non-access side.
- 6.12 Test unit - (refer to sections 10).
- 6.13 Complete Installation check list. (sec'n 14).

7. Block wall and Floor Installation Procedure (refer to figure 3)



- 7.1 Finished aperture size can be square or circular and 0 to 20mm larger than the nominal damper diameter. This leaves 10mm nominal gap all round. For core made apertures, please be aware of the rivet tails on the back of the installation plate. A shallow provision to be made as appropriate.
- 7.2 Preferably, prepare aperture whilst building wall/floor, or cut aperture if wall/floor already exists.
- 7.3 Cut size = finished size.
- 7.4 E.g. for 250 dia. damper, cut hole should be 270mm square or circular (250+20)
- 7.5 Mark out the position and size of the required aperture on the wall/floor.
- 7.6 Using appropriate means, cut the aperture in the wall/floor.
- 7.7 Position damper centrally in wall/floor aperture depth. Fix Installation Plate to wall or top face of floor.
- 7.8 There are a variety of proprietary fixings available. Fixings must be fire rated (steel, NOT aluminum or plastic). Check minimum dimension specification between fixing and edge of aperture. BSB recommend steel anchor type bolts Ø5mm minimum).
- 7.9 There is a pair of fixing holes at each of the installation plate corners, but only one fixing is required per corner. On larger dampers, there are also mid-span fixing holes that must be used. ALL Ø5mm fixing holes, except the 4 off unused corner fixings must be used.
- 7.10 Test Unit. (see section 11)
- 7.11 Complete Installation check list. (sec'n 14).

TABLE 1

Finished aperture sizes are based on 10mm nominal gap all round.

Damper Dia	Finished Aperture Dimension
100	120 x 120
125	145 x 145
150	175 x 175
160	185 x 185
200	220 x 220
250	270 x 270
300	320 x 320
315	335 x 335

8. Ablative Batt Installation Procedure.

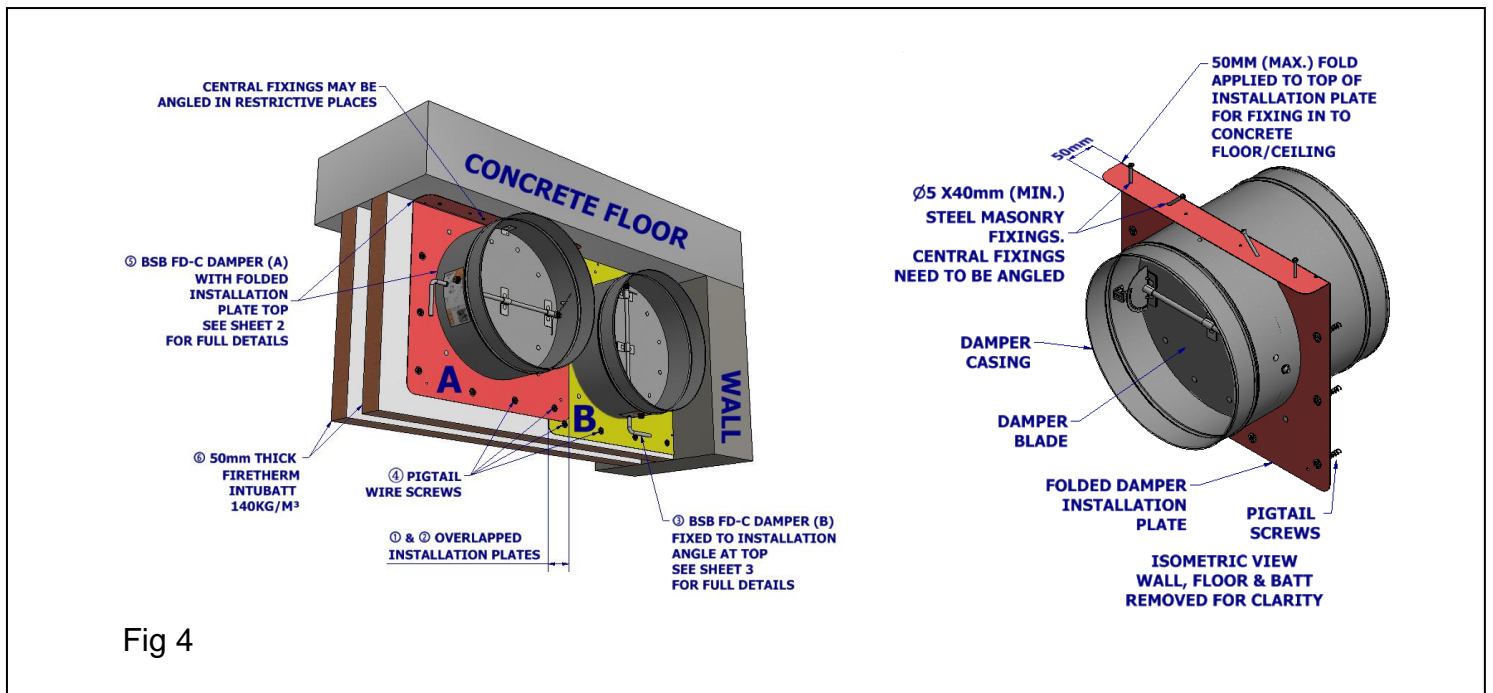


Fig 4

8.1 Folded Installation Plate Installation

- 8.1.1 The installation plate should be supplied 'factory folded'.
- 8.1.2 The damper should be installed within and affixed to the top of the aperture as shown in figure 4.
- 8.1.3 Fire batt material should be cut to suit void with zero clearance to produce an interference fit. The installation plate face, and all edges should be 'glued' in place, and a bead of intumescent mastic applied at all joints.
- 8.1.4 Note – two layers of 50mm min thickness are required to comply with the 'as tested' installation method.
- 8.1.5 Screw-in 50mm long spiral (pig tail) fixings through installation plate into batt material utilising one of the pair of corner holes, and all intermediate fixing holes
- 8.1.6 Recommended minimum void gap (per side) is 60mm and maximum 600mm. If folded, 40mm.

8.2 Cut down installation plate installation

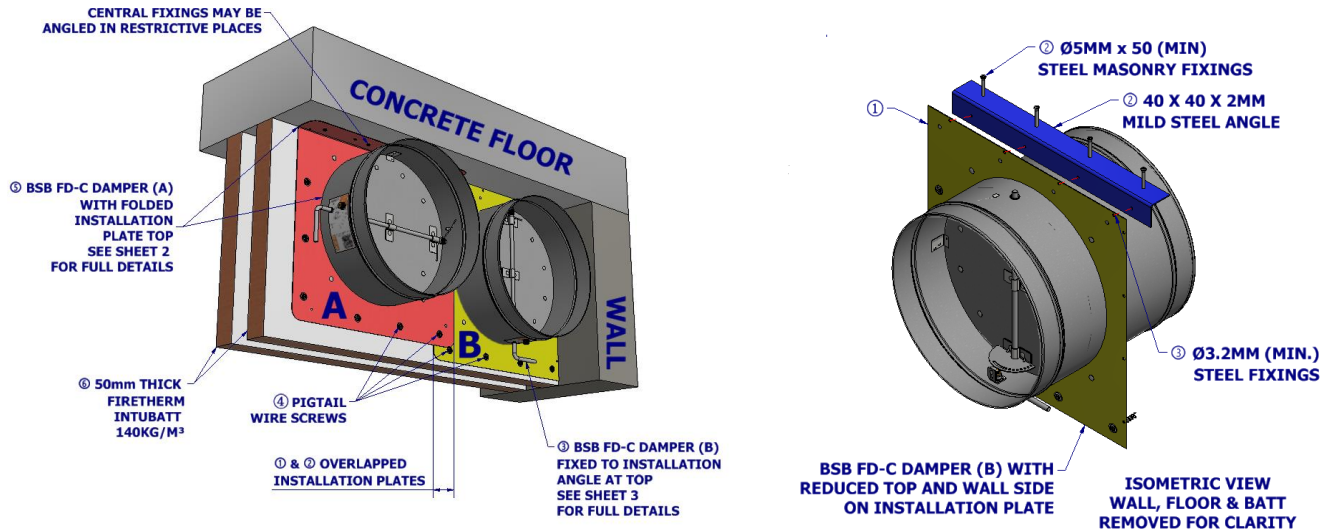


Fig 5

8.2.1 Reduced installation plate.

8.2.2 The installation plate is recommended to be supplied 'factory cut'. All four sides can be supplied cut down where required.

8.2.3 A length of steel supporting angle should be affixed to the top of the opening as shown in fig. 5

8.2.4 The damper should be installed within and affixed to the top supporting angle.

8.2.5 Fire batt material should be cut to suit void with zero clearance to produce an interference fit. The installation

plate face, and all edges should be 'glued' in place, and a bead of intumescent mastic applied at all joints.

8.2.6 Note – two layers of 50mm min thickness are required to comply with the 'as tested' installation method.

8.2.7 Screw-in 50mm long spiral (pig tail) fixings through installation plate into batt material utilising one of the pair of corner holes, and all intermediate fixing holes. (It may be necessary to drill additional fixing holes depending on plate size reduction).

8.2.8 Recommended minimum void gap (per side) is 40mm and maximum 600mm.

8.3 Overlapping installation plate installation (refer to fig 6)

8.3.1 It is permissible to overlap the installation plate with another installation plate where two dampers are near to each other.

8.3.2 The two overlapping plates should be secured together by drilling 3.2mm dia holes and using steel rivets mirroring the existing fixing pitches.

8.3.3 Screw-in 50mm long spiral (pig tail) fixings through installation plate perimeter into batt material utilising one of the pair of corner holes, and all intermediate fixing holes

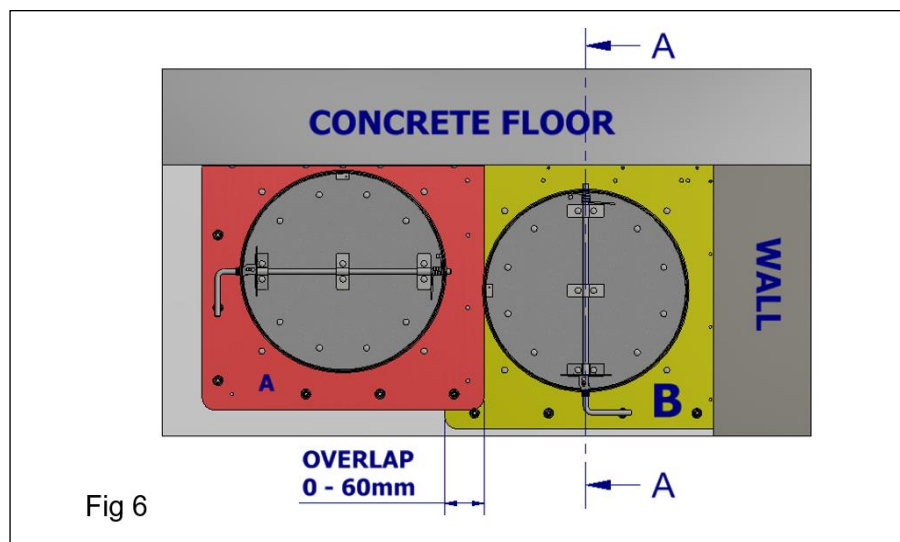
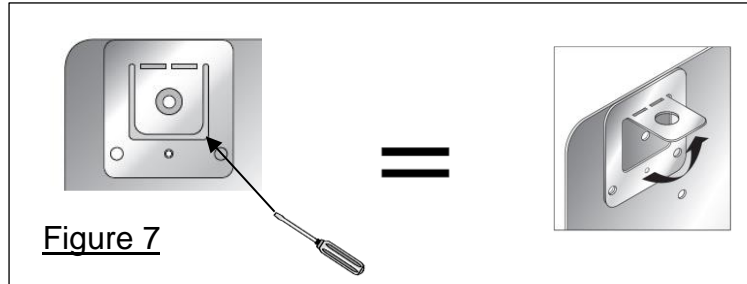


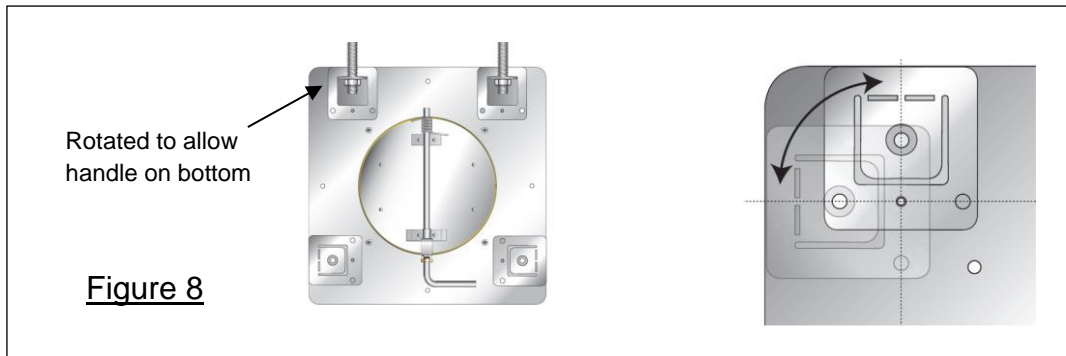
Fig 6

9. Rotatable Cleats

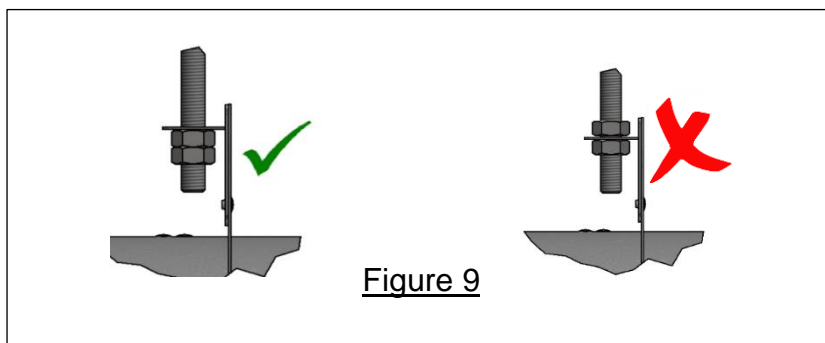
- 9.1 Rotatable Cleats are optional and where fitted should only be used to support the damper where the fire separation element is not yet in place, offering a temporary installation support. The cleats must not be the sole independent method of supporting the fire damper.
- 9.2 The cleats where requested, are supplied flat ready for bending out as and when required.
- 9.3 The cleats can be easily bent out at right angles by hand, using a medium size flat head screwdriver at one of the cleats pressed-out corners to start (see figure 7.).



- 9.4 The cleats can be rotated through 90° and 180° to suit handle position of either side, top or bottom. A minimum of two cleats to be used per damper. (Refer to figure 8).



- 9.4 it is important to use a second nut as a locknut. Do not use nuts above the cleat, as this may restrict drop rod expansion in a fire condition. (Refer to figure 9).



10. Commissioning

- 10.1 It is recommended that the blade is only opened and locked in position once the damper has been installed into the fire barrier and ductwork is connected. If set and locked open before installation, handling of the casing can cause the fusible link mechanism to actuate and close the blade. Dampers should always be checked that they are open and set correctly after installation.
- 10.2 **Do not over-tighten Fusible Link (FL).** Use light finger pressure only. The mechanism relies on engaging toothed spring into retention slots to hold blade in position. Rotate handle whilst tightening FL 'feeling' for slots. Once engaged, it is only necessary to rotate a further ¼ turn.
Do not force handle when FL assembly is set. This will result in damage to mechanism rendering unit inoperable.
- 10.3 Check the Installation conforms to specification. Refer to DW/145 E.2 and E.3 (appendix E check lists).
- 10.4 Test Damper as follows:-
 - 10.4.1 Remove access doors/flexible duct as appropriate.
 - 10.4.2 Check internally that any debris has been removed and the damper internals are clean.
 - 10.4.3 Unscrew fusible link (FL) anti-clockwise a couple of turns. Open damper using handle and set to desired blade position. (Only set blade position if being used as additionally as an air balance damper, otherwise set to fully open). Retighten the FL.
 - 10.4.4 Keeping hands and fingers out of way of the spring-loaded blade and handle, Unscrew the FL quickly. Check visually that the damper blade closes fully.
 - 10.4.5 Set the damper blade to the required open position.
 - 10.4.6 If damper operates satisfactorily, go to section 14 to complete checklist. If not, see Fault Finding Section 12.
 - 10.4.7 It is important to log, and review maintenance frequency based on inspections and test history.

11. Maintenance and Test

- 11.1 In accordance with BS 9999 Annex W.1, inspection should be undertaken annually. Local regulations/conditions may override this with periodic Inspection being carried out more frequently where corrosive or dirty conditions prevail. The maintenance log should be reviewed at each inspection and the frequency adjusted as required dependent upon findings. (BSB recommend a maximum of 1 year between inspections starting more frequently initially and reduce frequencies only if conditions are proven to allow).
- 11.2 Before starting, note the damper blade position so that it can be left in same position after test.
- 11.3 Remove access doors/flexible duct as appropriate. Check damper is clean and free of dust and debris, clean if necessary, using lightly oiled rag to clean inside of the damper case and blade. DEB "duck oil" is recommended.
- 11.4 Where blade axles/bearings are corroded, apply 2 drops of oil and operate a few times. This will free up the operation.
- 11.5 Now test damper operation. Keeping hands and fingers out of the way of the spring-loaded handle, Unscrew the FL quickly. Check visually that the damper blade closes fully.
- 11.6 Reset the damper blade to its previously set-position at the start of this exercise.
- 11.7 **Do not over-tighten Fusible Link (FL).** Use light finger pressure only. The mechanism relies on engaging toothed spring into retention slots to hold blade in position. Rotate handle whilst tightening FL 'feeling' for slots. Once engaged, it is only necessary to rotate a further ¼ turn.
- 11.8 **Do not force handle when FL assembly is set.** This will result in damage to mechanism rendering unit inoperable.
- 11.9 If damper operates satisfactorily, complete maintenance log (this should be retained by facilities management).
- 11.10 If damper does not operate correctly, go to fault-finding section (section 12). Recording findings and corrective action necessary to facilitate repair in maintenance log.
 - 11.10.1 **IMPORTANT.** When using powered duct cleaning equipment, with a powered rotary head, it is important that contact with the installed damper is not made, as this could result in damage to the damper internals.

12. Fault Finding

Symptom	Fault	Corrective Action
Damper does not travel fully open / close smoothly or has become stuck	Internal foreign object fouling blade	Inspect / remove items Clean and lubricate. (Refer to 11.3/11.4)
	Casing dented/damaged or not round	Minor damage may be corrected carefully with a soft mallet. (BSB always recommend replacement of damaged dampers)
	Damper internals have been exposed to moisture	Gently apply pressure to blade by hand to move open. Use Scotch Bright pad RED 07447 grade, wet with duck oil and clean the damper internally at the point where the blade closes. Wipe dry and leave clean. 'Massage' exposed peripheral blade seal until pliable.
Damper not in expected 'normal' state	Fusible link (FL) missing	Fit Fusible Link (FL) – Part No: 201448.
	Fusible link (FL) not tightened properly	Tighten Fusible Link (FL)
	Fusible Link (FL) has activated	Measure Fusible Link (FL) overall length, which is normally 29.5mm. If less than 28mm, replace with new link– Part No: 201448.
Fusible Link Mechanism too sensitive	Fusible Link (FL) has activated	Measure Fusible Link overall length, which is normally 29.5mm. If less than 28mm, replace with new link – Part No: 201448.
Fusible Link Mechanism too sensitive	Damper case damaged/not round	Check roundness. Reshape if minor adjustment needed. (BSB always recommend replacement of damaged dampers).
	Circlip on the handle lost/damaged	Contact BSB Tech Sales.
	Releases prematurely	Refer to 3.3.
Not possible to set damper to open position.	Fusible Link (FL) has activated	Measure FL overall length, which is normally 29.5mm. If less than 28mm, replace with new link.

For other symptoms not listed, please refer to BSB Technical Sales Office

13 Installation Check List

DAMPER DIA & REFERENCE NO.:	DAMPER LOCATION:					
WALL/FLOOR APERTURE SIZE						
WIDTH	HEIGHT					
DAMPER INSTALLED BY:						
Print name						
Signature:	Company:					
Date:						
DAMPER BLADE POSITION (CIRCLE APPROPRIATE POSITION)						
0.6	0.5	0.4	0.3	0.2	0.1	FULL OPEN
FINAL INSPECTION BY:						
(Print name)						
Signature:	Company:					
Date:						

This document to be provided to and kept with service records until the equipment referenced is removed.



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