

Fire dampers

- Type FKA-EU
- tested to EN 1366-2
- according to Declaration of Performance

DoP / FKA-EU / DE / 2013 / 001



CE

TROX[®] TECHNIK

The art of handling air

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FKA-EU with fusible link



FKA-EU with spring return actuator



In case of a fire, fire dampers shut automatically to prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments. The type FKA-EU fire dampers are tested to EN 1366-2 and comply with 15650. In addition to this, national guidelines must be complied with.

Correct approved installation locations are in solid walls and ceiling slabs, remote from solid walls, and in lightweight partition walls.

Airflow direction is not critical.

For installation in a horizontal duct, the damper blade shaft must be horizontal.

In the case of fire, the damper is triggered either by a fusible link at 72 °C or thermoelectrically with a spring return actuator.

The release mechanism is accessible and can be tested from the outside.

The class of performance of FKA-EU fire dampers depends on the application, see table on page 3.

Special features

- Complies with the requirements of EN 15650
- Tested for fire resistance properties according to EN 1366-2
- Classified according to EN 13501-3
- Robust and rigid sheet steel casing
- Integration into the central BMS with TROXNETCOM

Declaration of performance DoP / FKA-EU / DE / 2013 / 001

For further and up-to-date information, including the operating and installation manual, please refer to our website.

For a more detailed selection and design of our fire dampers please refer to the Easy Product Finder design programme on our website.

This technical leaflet is only valid in Belgium.

To ensure complete functioning of the fire damper it is essential to read the operating and installation manual and to comply with it. In addition, the national guidelines must be complied with. The general maintenance standard EN 13306 also applies.


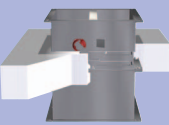
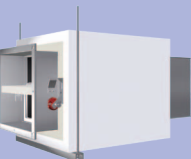
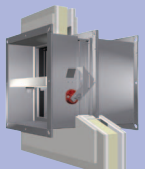
The functional reliability of fire dampers must be tested at least every six months. If two consecutive tests are successful, the next test can be conducted one year later.

In general, it is sufficient to release and re-open the fire damper; for a fire damper with spring return actuator this can be done by remote control.

Fire dampers must be included in the regular cleaning schedule of the ventilation system.

Design information

- The class of performance of FKA-EU fire dampers depends on the application, see table.
- Installation of fire dampers must be carried out in compliance with provisions of federal state law and the generally recognised codes of practice.
- Ducting should be installed in such a manner that it does not impose any loads on the fire damper in case of a fire.
- It is recommended to use flexible connectors to connect rigid ducting to the fire damper for particular applications.
- Fire dampers with a casing length of 240 mm must be extended with an extension piece or a duct before installation into walls or ceilings.

Installation location	Construction and building material	Minimum thickness [mm]	Class of performance	Casing length [mm]		Installation details on page
				L = 240	L = 500	
Solid walls 	Solid walls, gross density $\geq 500 \text{ kg/m}^3$	115	EI 120 ($v_e i \leftrightarrow o$) S	x	x	17
Solid ceiling slabs 	Solid ceiling slabs, gross density $\geq 600 \text{ kg/m}^3$	150	EI 120 ($h_o i \leftrightarrow o$) S	x	x	17
Remote from solid walls 	In fire-resistant ducting	–	EI 60 ($v_e i \leftrightarrow o$) S	x	x	18
Lightweight partition walls 	With metal support structure and cladding on both sides, with cover strips	125	EI 120 ($v_e i \leftrightarrow o$) S ¹	x	x	20
	With metal support structure and cladding on both sides, without cover strips	100	EI 60 ($v_e i \leftrightarrow o$) S	x	x	21

¹ For lightweight partition walls $\geq F120$

Construction · Dimensions

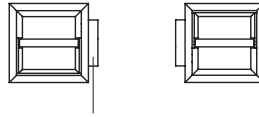
Characteristics

- Classified according to EN 13501-3
- For classes of performance see the table on page 3
- Airflow in either direction
- Release temperature 72 °C

Construction features

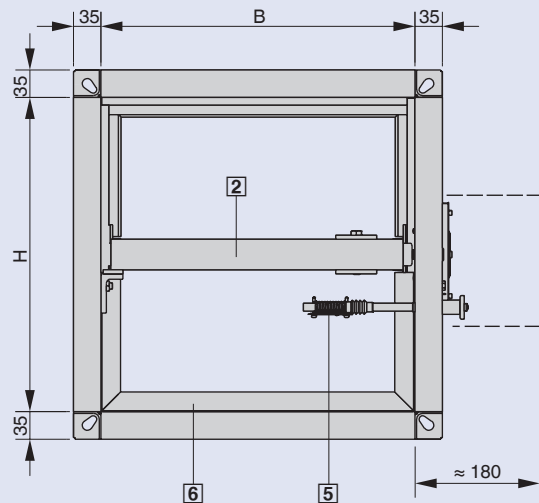
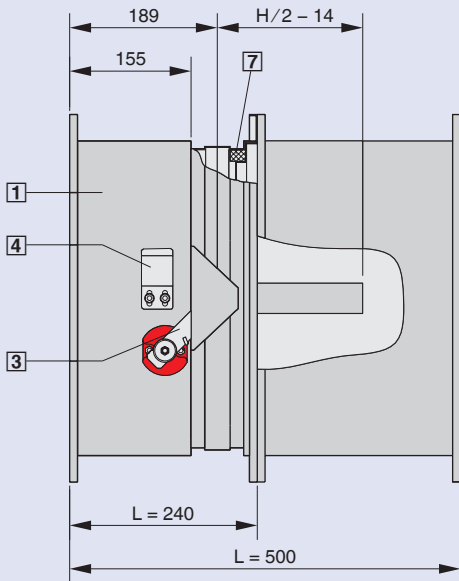
- Two casing lengths to allow for various uses
- Rectangular construction, rigid frame
- Flanges with pre-drilled holes on both ends
- Intermediate dimensions in 5 mm increments for both width and height are available
- Closed blade air leakage according to EN 1751, minimum class 2
- Casing air leakage to EN 1751, minimum class B

Approved installation positions for horizontal ducts

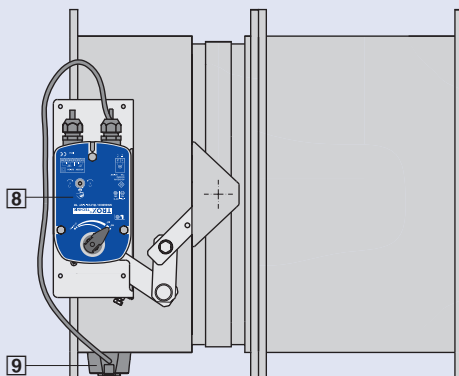


Release mechanism

FKA-EU with fusible link



FKA-EU with spring return actuator



----- Keep clear to provide access to release mechanism or spring return actuator

- 1 Casing
- 2 Damper blade
- 3 Handle
- 4 Interlock
- 5 Fusible link
- 6 Perimeter travel stop
- 7 Seal
- 8 Spring return actuator
- 9 Thermoelectric release mechanism

Construction · Dimensions

The construction variants with stainless steel or powder-coated casing meet even more critical requirements for corrosion protection.

Detailed listing on request.

Construction		Order code
Casing	Damper blade	
Galvanised	Standard	
Powder-coated	Standard	1
Stainless steel	Standard	2
Galvanised	Coated	7
Powder-coated	Coated	1-7
Stainless steel	Coated	2-7

Materials

- Casing in galvanised sheet steel, with powder coating RAL 7001 (1), or in stainless steel 1.4301 (2)
- Damper blade made of special insulation material
- Damper blade coated in RAL 7001
- Damper blade shafts in stainless steel
- Brass or stainless steel bearings (1, 2)
- Damper blade seal made of polyurethane

Dimensions

FKA-EU with fusible link
Dimensions [mm] / Weight [kg] for L = 240 mm / L = 500 mm

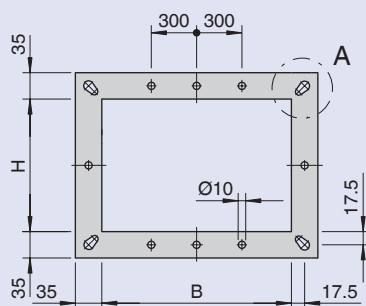
H	B																			
	200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	7/11	8/12	8/13	9/14	10/15	10/16	11/17	12/18	13/19	13/20	14/21	14/22	15/23	18/26	19/28	21/30	22/32	23/34	25/36	26/38
250	8/12	8/13	9/14	10/15	11/16	12/17	13/19	13/20	14/21	15/22	16/23	17/24	17/25	20/29	22/31	23/33	25/36	27/38	28/40	30/42
300	8/13	9/14	10/15	11/16	12/18	13/19	14/20	15/21	16/23	17/24	18/25	18/26	19/28	22/31	24/34	26/36	28/39	30/41	32/44	33/46
350	9/14	10/15	11/16	12/18	13/19	14/21	15/22	16/23	17/25	18/26	19/27	20/29	21/30	25/34	27/37	29/39	31/42	33/45	35/47	37/50
400	10/15	11/16	12/18	13/19	14/21	16/22	17/24	18/25	19/27	20/28	21/30	22/31	24/32	27/36	29/39	32/42	34/45	36/48	38/51	41/54
450			13/19	14/21	16/22	17/24	18/25	20/26	21/28	22/30	23/32	24/33	26/35	29/39	32/42	34/45	37/49	39/52	42/55	44/58
500			14/20	15/22	17/24	18/25	19/27	21/28	22/30	23/32	25/34	26/35	28/37	31/42	34/45	37/48	40/52	42/55	45/59	48/62
550			15/22	16/23	18/25	19/27	21/29	22/30	23/32	25/34	27/36	28/38	30/40	34/45	37/47	39/51	42/55	45/59	49/62	52/66
600			16/23	17/25	19/27	21/28	22/30	23/32	25/34	27/36	29/38	30/40	32/42	36/47	39/51	42/54	45/58	49/62	52/66	55/70
650			17/24	19/26	21/28	22/30	23/32	25/34	27/36	29/38	31/40	32/42	34/45	38/49	42/54	45/58	49/62	52/65	55/69	59/74
700			18/25	20/27	22/29	23/32	25/34	26/35	29/38	31/40	32/42	34/45	36/47	40/52	44/56	48/61	51/65	55/69	59/73	62/78
750			19/27	21/28	23/31	25/33	26/35	28/37	30/40	32/42	34/44	36/46	38/49	43/55	46/59	51/64	54/69	58/72	62/77	65/81
800			20/28	22/30	24/32	26/35	28/37	30/40	32/42	34/44	36/47	38/49	40/51	45/57	49/62	53/66	57/71	61/76	65/81	69/85

FKA-EU with spring return actuator: weight + 3 kg.

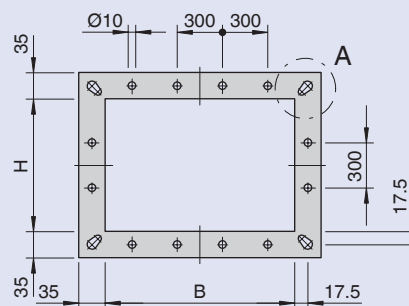
Example: Weight for B × H = 200 mm × 200 mm
L = 240 mm: 7 kg / L = 500 mm: 11 kg

Pre-drilled flanges

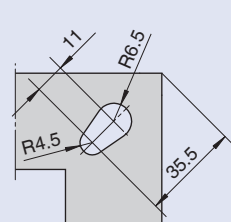
Odd number of holes



Even number of holes



Detail A – * corner holes



Dimensions [mm]

B or H	200	300	400	500	600	650	750	900	1100	1300	1500
	250	350	450	550		700	800	1000	1200	1400	
No. of holes horizontally (B)*			1	1	1	2	2	3	3	4	4
No. of holes vertically (H)*			1	1	1	2	2				

* excluding corner holes

Accessories

Cover grille

Cover grille

If the fire damper is not connected to a duct, cover grilles should be used.

For certain heights an extension piece may be required, see table.

Fire damper, cover grille and, if applicable, extension piece are assembled at the factory to form a unit. The free cross sectional area of the cover grille is approx. 70 %.

The fixing holes in the cover grilles and extension pieces match those in the fire damper flanges.

Cover grilles and extension pieces are also available separately. If a cover grille is used on the installation side, casing length $L = 500$ mm must be used.

Accessories		Order code
Operating side	Installation side	
Cover grille	–	A0
–	Cover grille	0A
Cover grille	Cover grille	AA

Location and length of extension pieces Dimensions [mm]			
H	Operating side	Installation side	L
200 – 300	–	–	500
350 – 550	120	–	500
600 – 800	260	120	500

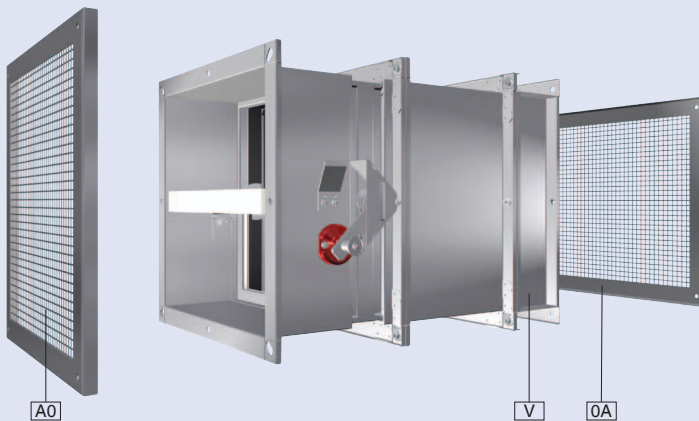
Materials

– Cover grilles in galvanised sheet steel (powder-coated silver-grey (RAL 7001) when used with powder-coated (1) and stainless steel (2) dampers)

– Extension piece in galvanised steel (it is also powder coated silver-grey (RAL 7001) when used with powder coated (1) and stainless steel (2) dampers)

Cover grille

Operating side Installation side

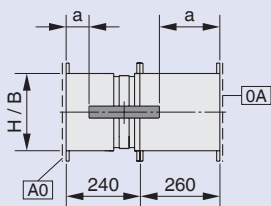


Important!

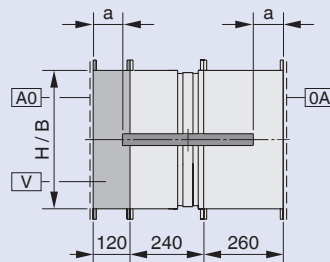
- Extension pieces and cover grilles are supplied factory assembled.
- Minimum distance »a« between the open damper blade edge and the circular spigot should be approx. 50 mm.

- A** Cover grille, mesh aperture 10 mm x 10 mm, wire width 2 mm
- V** Extension piece

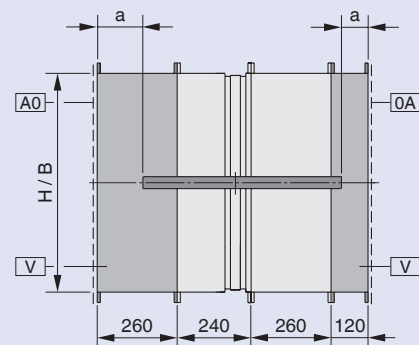
Without extension piece



With one extension piece Operating side



With two extension pieces Operating and installation sides



Circular spigot plate

Use of circular spigot plates facilitates the direct connection of circular ducts.

For certain heights an extension piece may be required, see table.

Fire damper, spigot plate(s) and, if applicable, extension piece(s) are factory assembled to form a unit.

The fixing holes in the spigot plates and extension pieces match those in the fire damper flanges.

Spigot plates and extension pieces are also available separately.

If a spigot plate is used on the installation side, casing length $L = 500$ mm must be used.

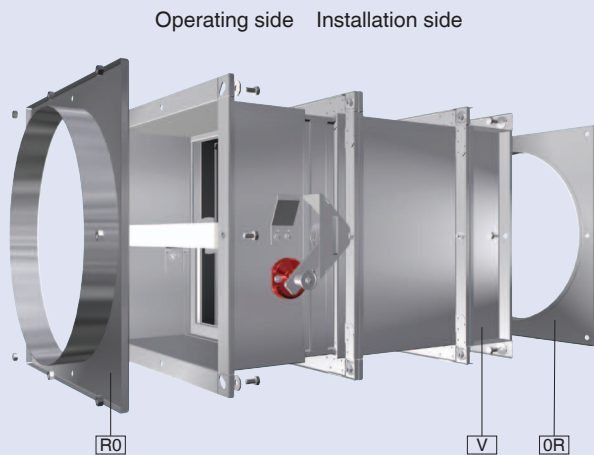
Accessories		Order code
Operating side	Installation side	
Spigot	–	R0
–	Spigot	OR
Spigot	Spigot	RR

Location and length of extension pieces Dimensions [mm]			
H	Operating side	Installation side	L
200 – 300	–	–	500
350 – 550	120	–	500
600 – 800	260	120	500

Materials

- Circular spigot plate in galvanised sheet steel (powder-coated silver-grey (RAL 7001) when used with powder-coated (1) and stainless steel (2) dampers)
- Extension piece in galvanised steel (it is also powder coated silver-grey (RAL 7001) when used with powder coated (1) and stainless steel (2) dampers)

Circular spigot plate

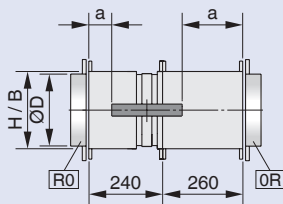


Important!

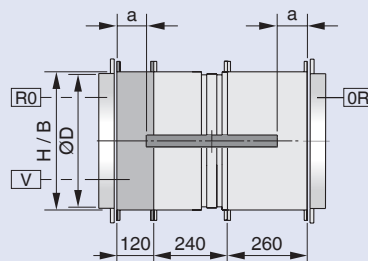
- Extension pieces and spigot plates are supplied factory assembled.
- Minimum distance »a« between the open damper blade edge and the circular spigot plate should be approx. 50 mm.

- R Circular spigot plate
- V Extension piece

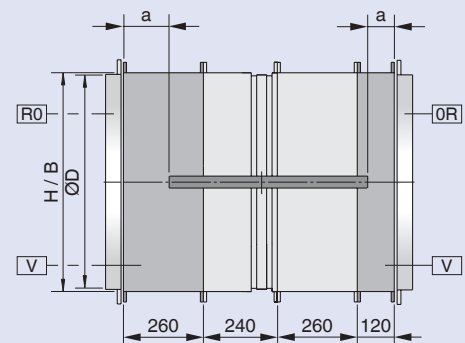
Without extension piece



With one extension piece Operating side



With two extension pieces Operating and installation sides



Dimensions [mm]

Nominal size	200	250	300	350	400	450	500	550	600	650	700	750	800
B × H	200 × 200	250 × 250	300 × 300	350 × 350	400 × 400	450 × 450	500 × 500	550 × 550	600 × 600	650 × 650	700 × 700	750 × 750	800 × 800
ØD	198	248	248	313	398	448	498	498	558	628	628	708	798

Accessories

Flexible connector

Flexible connectors

Ducting must be installed in such a manner that it does not impose any loads on the fire damper in case of a fire. As ducts may expand and walls may become deformed in case of a fire, we recommend for the following applications using flexible connectors when connecting the fire damper to rigid ducts:

- at the end of a fire-resistant duct
- in lightweight partition walls

The flexible connectors should be installed in such a way that both ends can compensate both tension and compression. Flexible ducts can be used as an alternative.

For certain heights an extension piece may be required, see table.

The fixing holes in the flexible connectors and extension pieces match those in the fire damper flanges.

If a flexible connector is used on the installation side, casing length $L = 500$ mm must be used.

Flexible connectors are also available separately.

Accessories		Order code
Operating side	Installation side	
Flexible connector	–	S0
–	Flexible connector	0S
Flexible connector	Flexible connector	SS

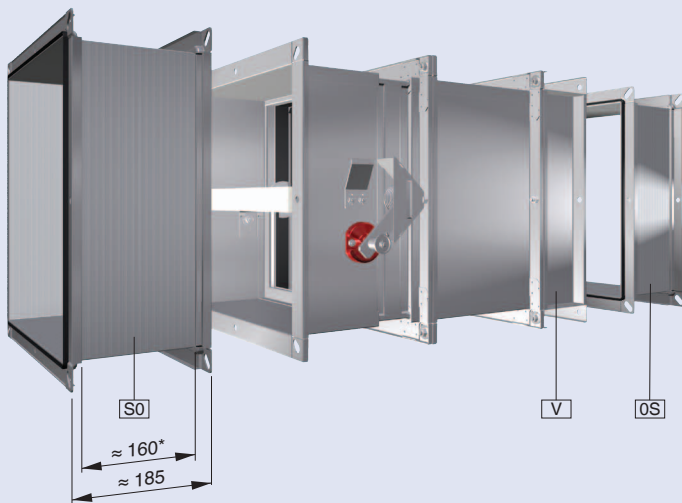
Location and length of extension pieces Dimensions [mm]			
H	Operating side	Installation side	L
200 – 300	–	–	500
350 – 550	120	–	500
600 – 800	260	120	500

Materials

- Flexible connectors in galvanised steel and fibre-reinforced plastic
- Extension piece in galvanised steel (it is also powder coated silver-grey (RAL 7001) when used with powder coated (1) and stainless steel (2) dampers)

Flexible connectors

Operating side Installation side



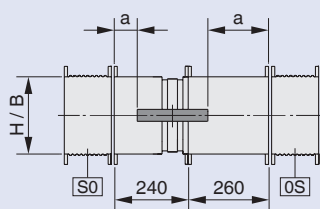
Important!

- Extension pieces are supplied factory assembled. Flexible connectors are supplied unassembled, connection material is to be provided by others.
- Minimum distance »a« between the open damper blade edge and the flexible connector should be approx. 50 mm.

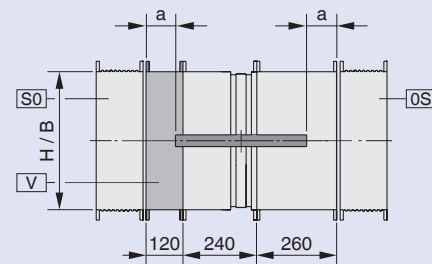
- S Flexible connector
- V Extension piece

* flexible length ≥ 100 mm when installed

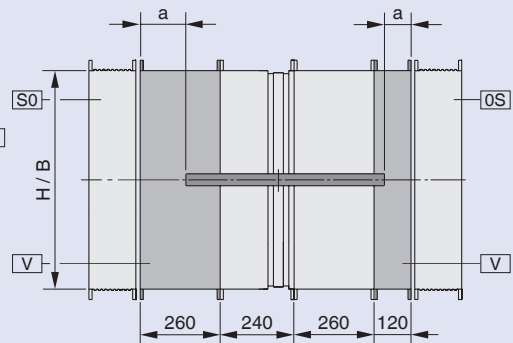
Without extension piece



With one extension piece Operating side



With two extension pieces Operating and installation sides



FKA-EU with fusible link

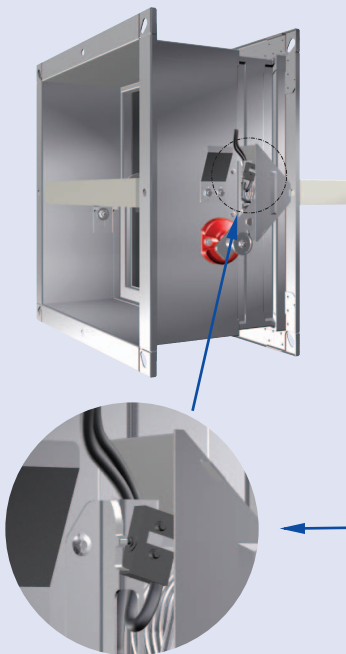
Limit switches with volt-free contacts enable the damper blade position indication. Relays or indicator lights for fire alarm systems can be used up to the maximum switch rating. One limit switch each is required for damper blade positions OPEN and CLOSED.

Fire dampers with a fusible link can be supplied with one or two limit switches; the switches can also be fitted later.

Attachments	Order code
Standard construction	Z00
Standard construction with limit switch for damper blade position CLOSED	Z01
Standard construction with limit switch for damper blade position OPEN	Z02
Standard construction with limit switches for damper blade positions CLOSED and OPEN	Z03

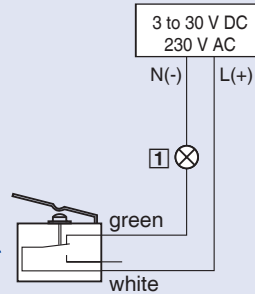
Limit switch	
Connecting cable length / cross section	1 m / 3 x 0.34 mm ²
Protection level	IP 66
Type of contact	1 changeover contact, gold-plated
Max. switching current	0.5 A
Max. switching voltage	30 V DC, 250 V AC
Contact resistance	approx. 30 mΩ

Limit switch

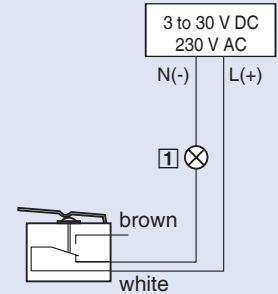


Wiring examples

Limit switch not actuated



Limit switch actuated



1 Indicator light or relay, to be provided by others

FKA-EU when open



Damper blade position indicator	Limit switch
OPEN	actuated
CLOSED	not actuated

FKA-EU when closed



Damper blade position indicator	Limit switch
OPEN	not actuated
CLOSED	actuated

Attachments

Spring return actuator

FKA-EU with spring return actuator BLF

for combinations of dimensions up to B x H = 800 x 400 mm

Operation of the fire damper with a spring return actuator allows remote control and/or release by a suitable smoke detector. If the supply voltage fails, or with thermoelectric release, the damper closes (power off to close). Fire dampers with spring return actuator can be functionally checked OPEN/CLOSED/ OPEN.

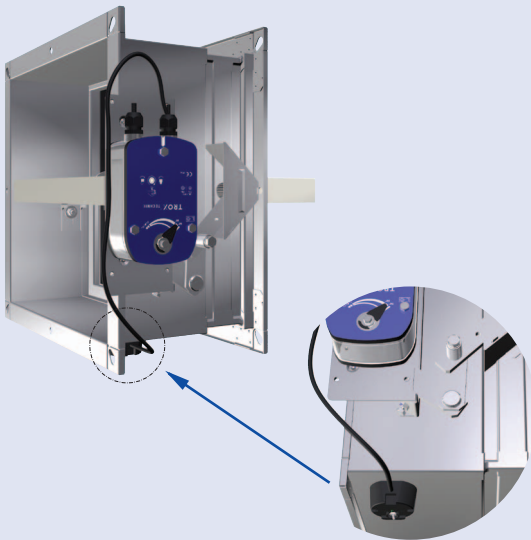
The actuator includes two limit switches. The connecting cables of the BLF24-T-ST TR are fitted with plugs. This ensures quick and easy connection to the TROX AS-i bus system.

A conversion kit is available for retrofitting an actuator on a standard construction.

Attachments	Order code
BLF230-T TR	Z43
BLF24-T-ST TR	Z45

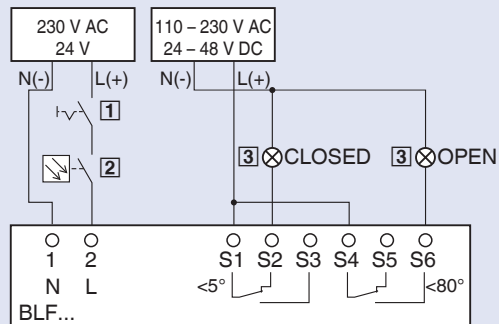
Spring return actuator BLF		230-T TR	24-T-ST TR
Supply voltage		230 V AC $\pm 14\%$ 50/60 Hz	24 V AC $\pm 20\%$ 50/60 Hz or 24 V DC $-10\% / +20\%$
Power rating	Spring compression	6 W	5 W
	Hold position	3 W	2.5 W
	Rating	7 VA	
Running time	Motor / spring return	40 to 75 s / 20 s	
Limit switch*	Type of contact	2 change-over contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 3 A	
	Contact resistance	< 100 m Ω	
IEC protection class		II	III
Protection level		IP54	
Connecting cable	Length / Cross section	1 m / 2 (6*) x 0.75 mm ²	

Spring return actuator Type BLF ...



Wiring example

CLOSED position



- 1 Switch for opening and closing, to be provided by others
- 2 Optional release mechanism, e.g. TROX smoke detector type RM-O-3-D or RM-O-VS-D
- 3 Indicator light, to be provided by others

FKA-EU with spring return actuator BF

Operation of the fire damper with a spring return actuator allows remote control and/or release by a suitable smoke detector. If the supply voltage fails, or with thermoelectric release, the damper closes (power off to close). Fire dampers with spring return actuator can be functionally checked OPEN/CLOSED/OPEN.

The actuator includes two limit switches. The connecting cables of the BF24-T-ST TR are fitted with plugs. This ensures quick and easy connection to the TROX AS-i bus system.

A conversion kit is available for retrofitting an actuator on a standard construction.

Attachments	Order code
BF230-T TR	Z43
BF24-T-ST TR	Z45

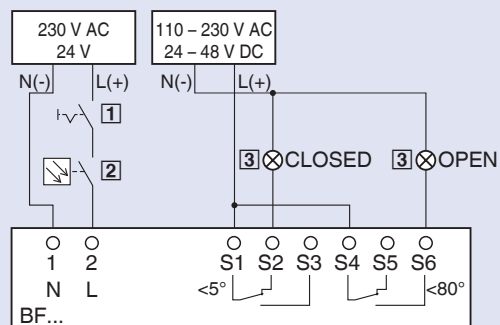
Spring return actuator BF		230-T TR	24-T-ST TR
Supply voltage		230 V AC $\pm 14\%$ 50/60 Hz	24 V AC $\pm 20\%$ 50/60 Hz or 24 V DC $-10\% / +20\%$
Power rating	Spring compression	8 W	7 W
	Hold position	3 W	2 W
	Rating	12.5 VA	10 VA
Running time	Motor / spring return	approx. 140 s / approx. 16 s	
Limit switch*	Type of contact	2 change-over contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 6 A	
	Contact resistance	< 100 m Ω	
IEC protection class		II	III
Protection level		IP54	
Connecting cable	Length / Cross section	1 m / 2 (6*) x 0.75 mm ²	

Spring return actuator type BF ...



Wiring example

CLOSED position



- 1 Switch for opening and closing, to be provided by others
- 2 Optional release mechanism, e.g. TROX smoke detector type RM-O-3-D or RM-O-VS-D
- 3 Indicator light, to be provided by others

Attachments

TROXNETCOM

FKA-EU with spring return actuator and TROXNETCOM

The fire dampers with spring return actuator BLF24-T-ST TR or BF24-T-ST TR and the modules shown here as attachments form a functional unit ready for operation by an automatic fire damper controller. The components are factory-assembled and wired. Only the bus line and the supply voltage (LON only) remain to be connected by others.

The AS interface is a world-standard bus system according to EN 50295 and IEC 62026-2. It enables the integration of different components (modules) in a network regardless of the manufacturer and the design. The modules control actuators and/or receive signals from sensors.

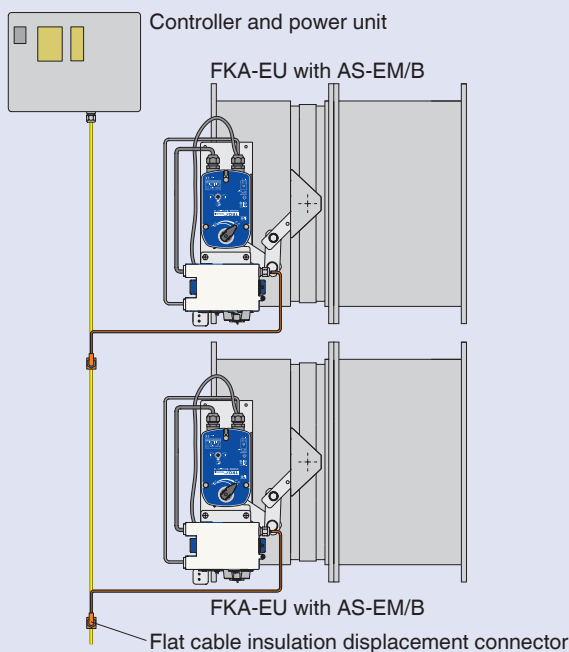
Attachments	Order code
AS-EM/B and BLF24-T-ST TR* or BF24-T-ST TR	ZA03

Attachments	Order code
LON-WA1/B2 and BLF24-T-ST TR* or BF24-T-ST TR	ZL06
LON-WA1/B2-AD and BLF24-T-ST TR* or BF24-T-ST TR	ZL07
LON-WA1/B2-AD230 and BLF24-T-ST TR* or BF24-T-ST TR	ZL08

* for combinations of dimensions up to B x H = 800 x 400 mm

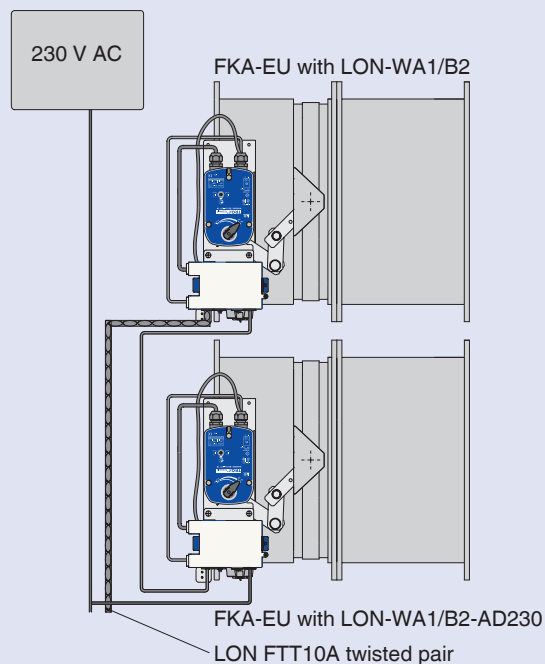
LON and LonMark indicate a standard local operating network system with manufacturer-independent communications. Data is transferred by a microprocessor supplied by Echelon Corporation using a unified protocol. LonMark defines standards to ensure product compatibility.

AS-EM/B module



- The module sends the control signals between the spring return actuator and the controller and power unit. This enables the actuator to be controlled and the monitoring of running time during functional testing.
- The supply voltage (24 V DC) for the module and the actuator is transmitted using the AS-i flat cable.
- Function display:
 - operation
 - 4 inputs
 - 2 outputs

Module LON-WA1/...



- **LON-WA1/B2**
To control up to 2 fire dampers
- **LON-WA1/B2-AD**
Connection box for the second fire damper with 24 V AC supply voltage
- **LON-WA1/B2-AD230**
Connection box for the second fire damper with 230 V AC supply voltage

For further information please refer to our website.

Nomenclature

B	[mm]	: Width
H	[mm]	: Height
A	[m ²]	: Free cross sectional area
\dot{V}	[m ³ /h]	: Volume flow rate
v_A	[m/s]	: Flow velocity with regard to B x H
Δp_t	[Pa]	: Total differential pressure (duct installation) $\Delta p_t = \zeta \times \rho / 2 \times v_A^2$
ζ		: Resistance coefficient (fully ducted)
ρ	[kg/m ³]	: Air density (approx. 1.2 at 20 °C)
f_m	[Hz]	: Octave band centre frequency
L_{WA}	[dB(A)]	: Sound power level of the air-regenerated noise in the duct
L_W	[in dB]	: Octave band sound power level L $L_W = L_{WA} + \text{correction value to obtain octave level (see table 4)}$

L_{WNC}	: NC rating of the sound power level $L_{WNC} \approx L_{WA} - 5$
K	: Correction value for damper width B ≠ 600 mm (see table 5)

All sound power levels are based on 1 pW.

All noise levels were determined in a reverberation chamber. The sound power data has been determined and corrected according to ISO 5135, February 1999.

Using quick selection for sizing fire dampers will quickly provide optimum results. It ensures compliance with normally acceptable aerodynamic and acoustic limits.

- Airflow velocity
- Total differential pressure
- Sound power level

For a more detailed selection and design of our fire dampers please refer to the Easy Product Finder design programme on our website.

Volume flow rate [m³/h] at $\Delta p_t < 35$ Pa

H [mm]	L_{WA} [dB(A)]	B [mm]																			
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	35	350	450	600	700	800	900	1050	1150	1250	1400	1500	1600	1700	1950	2150	2400	2650	2850	3100	3300
	45	500	650	800	1000	1150	1300	1450	1650	1800	1950	2100	2300	2450	2750	3100	3400	3750	4050	4400	4700
250	35	500	650	850	1000	1150	1350	1500	1650	1850	2000	2150	2300	2500	2800	3150	3450	3800	4150	4450	4800
	45	700	950	1200	1400	1650	1900	2150	2350	2600	2850	3050	3300	3550	4000	4450	4950	5400	5850	6350	6800
300	35	650	850	1100	1300	1500	1750	1950	2150	2400	2600	2800	3000	3250	3650	4100	4500	4950	5350	5800	6200
	45	950	1250	1550	1850	2150	2450	2750	3050	3400	3700	4000	4300	4600	5200	5800	6400	7050	7650	8250	8850
350	35	800	1050	1350	1600	1850	2150	2400	2650	2950	3200	3450	3700	4000	4500	5050	5550	6050	6600	7100	7650
	45	1150	1550	1900	2300	2650	3050	3400	3800	4150	4550	4900	5300	5650	6400	7150	7900	8650	9400	10100	10850
400	35	950	1250	1600	1900	2200	2550	2850	3150	3450	3800	4100	4400	4700	5350	5950	6550	7200	7800	8450	9050
	45	1350	1800	2250	2700	3150	3600	4050	4500	4950	5350	5800	6250	6700	7600	8450	9350	10200	11100	12000	12850
450	35			1850	2200	2550	2950	3300	3650	4000	4350	4700	5100	5450	6150	6850	7600	8300	9000	9700	10450
	45			2600	3150	3650	4150	4650	5200	5700	6200	6700	7200	7750	8750	9750	10800	11800	12800	13800	14850
500	35			2100	2500	2900	3300	3700	4150	4550	4950	5350	5750	6150	6950	7800	8600	9400	10200	11000	11800
	45			2950	3550	4150	4700	5300	5850	6450	7050	7600	8200	8750	9900	11050	12200	13350	14500	15650	16800
550	35			2350	2800	3250	3700	4150	4600	5050	5500	5950	6450	6900	7800	8700	9600	10500	11400	12300	13150
	45			3300	3950	4600	5250	5900	6550	7200	7850	8500	9150	9800	11050	12350	13600	14900	16200	17450	18750
600	35			2600	3100	3600	4100	4600	5100	5600	6100	6600	7100	7600	8600	9600	10550	11550	12550	13550	14550
	45			3650	4400	5100	5800	6550	7250	7950	8650	9400	10100	10800	12200	13600	15050	16450	17850	19250	20650
650	35			2850	3400	3950	4500	5050	5600	6150	6650	7200	7750	8300	9400	10500	11550	12650	13750	14800	15900
	45			4000	4800	5600	6350	7150	7950	8700	9500	10250	11050	11800	13350	14900	16450	17950	19500	21050	22600
700	35			3050	3650	4250	4850	5450	6050	6650	7250	7850	8450	9000	10200	11350	12550	13700	14900	16050	17250
	45			4350	5200	6050	6900	7750	8600	9450	10300	11150	12000	12800	14500	16150	17850	19500	21150	22850	24500
750	35			3300	3950	4600	5250	5900	6550	7200	7800	8450	9100	9700	11000	12250	13550	14800	16050	17300	18600
	45			4700	5650	6550	7450	8400	9300	10200	11100	12000	12900	13800	15650	17450	19250	21050	22800	24600	26400
800	35			3550	4250	4950	5650	6350	7000	7700	8400	9050	9750	10450	11800	13150	14500	15850	17200	18550	19900
	45			5050	6050	7050	8000	9000	9950	10950	11900	12900	13850	14850	16750	18700	20600	22550	24450	26400	28300

Aerodynamic selection

Differential pressure

Example 1

Given data

Volume flow rate: 1250 l/s (4500 m³/h)
 Maximum width: 600 mm
 Required sound power level: 35 dB(A)

Quick selection

FKA-EU / 600 × 400 × 500

Result

$v_A = 4500 \text{ m}^3/\text{h} / (0.6 \text{ m} \times 0.4 \text{ m} \times 3600) = 5.2 \text{ m/s}$
 $\Delta p_t = 11 \text{ Pa}$ (from table 1, for B = 600 mm)
 $L_{WA} = 41 \text{ dB(A)}$ (from table 3, for B = 600 mm)

For a more detailed selection and design of our fire dampers please refer to the Easy Product Finder design programme on our website.

Table 1: Differential pressure Δp_t [Pa] for damper blade width B = 600 mm

H [mm]	B [mm]	v_A [m/s]										
		2	3	4	5	6	7	8	9	10	11	12
200	600	7	15	26	41	59	80	104	132	163	197	235
250		4	9	15	24	34	46	61	77	95	115	136
300		3	6	11	17	24	33	43	54	67	81	96
350		2	5	8	13	19	25	33	42	52	63	75
400		2	4	7	11	15	21	27	35	43	52	62
450		1	3	6	9	13	18	23	30	37	44	53
500		1	3	5	8	12	16	21	26	32	39	47
550		1	3	5	7	10	14	19	24	29	35	42
600		1	2	4	7	10	13	17	22	27	32	38
650		1	2	4	6	9	12	16	20	25	30	35
700		1	2	4	6	8	11	15	19	23	28	33
750		1	2	3	5	8	11	14	18	22	26	31
800		1	2	3	5	7	10	13	17	21	25	30

Maximum upstream velocity: ≤ 8 m/s for standard construction, ≤ 12 m/s for construction with spring return actuator.

Table 2: Correction values based on other damper widths B

B [mm]	B [mm]																			
	200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
600	2.6	1.9	1.6	1.4	1.3	1.2	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7

Aerodynamic selection

Sound power level

Example 2

Given data

Volume flow rate: 4250 l/s (15300 m³/h)
 Maximum width: 1000 mm
 Required sound power level: 45 dB(A)

Quick selection

FKA-EU / 1000 × 700 × 500

Result

$v_A = 15300 \text{ m}^3/\text{h} / (1.0 \text{ m} \times 0.7 \text{ m} \times 3600) = 6.1 \text{ m/s}$
 $\Delta p_t = 8 \text{ Pa}$ (from table 1, for B = 600 mm)
 Correction for B = 1000 from table 2
 $\Delta p_t = 8 \text{ Pa} \times 0.8 \approx 7 \text{ Pa}$
 $L_{WA} = 44 \text{ dB(A)}$ (from table 3, for B = 600 mm)
 Correction for B = 1000 from table 5
 $L_{WA} = 44 \text{ dB(A)} - 1 = 43 \text{ dB(A)}$

Sound power level spectrum								
f_m [Hz]	63	125	250	500	1000	2000	4000	8000
L_{WA} [dB(A)]	43							
Correction value from table 4	4	6	1	-3	-6	-9	-17	-25
L_w [dB]	47	49	44	40	37	34	26	18

For a more detailed selection and design of our fire dampers please refer to the Easy Product Finder design programme on our website.

Table 3: Sound power level L_{WA} [dB(A)] for damper width B = 600 mm

H [mm]	B [mm]	v_A [m/s]										
		2	3	4	5	6	7	8	9	10	11	12
200	600	24	36	44	50	55	60	64	67	70	73	75
250		20	32	40	46	51	56	59	63	66	69	71
300		18	29	37	44	49	53	57	60	63	66	69
350		16	28	36	42	47	52	56	59	62	65	67
400		15	27	35	41	46	51	55	58	61	64	66
450		14	26	34	41	46	50	54	57	60	63	65
500		14	25	34	40	45	50	53	57	60	62	65
550		13	25	33	40	45	49	53	56	59	62	64
600		13	25	33	39	44	49	53	56	59	62	64
650		13	24	33	39	44	48	52	56	59	61	64
700		13	24	32	39	44	48	52	55	58	61	64
750		12	24	32	38	44	48	52	55	58	61	63
800		12	24	32	38	43	48	52	55	58	61	63

Maximum upstream velocity: ≤ 8 m/s for standard construction, ≤ 12 m/s for construction with spring return actuator.

Table 4: Correction values to obtain octave levels in dB/Oct.

v_A [m/s]	f_m [Hz]							
	63	125	250	500	1000	2000	4000	8000
2	10	13	3	-3	-15	-17	-28	-36
4	8	10	3	-3	-7	-11	-21	-29
6	4	6	1	-3	-6	-9	-17	-25
8	2	4	-1	-3	-4	-7	-14	-22
10	-1	-2	-3	-4	-4	-7	-12	-20

Aerodynamic selection

Free cross sectional area, resistance coefficient and correction values

Table 5: Free cross sectional area, resistance coefficient and correction values

H [mm]		B [mm]																			
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	A [m ²]	0.014	0.019	0.024	0.029	0.034	0.039	0.044	0.049	0.054	0.059	0.064	0.069	0.074	0.084	0.094	0.104	0.114	0.124	0.134	0.144
	ζ	5.31	4.30	3.75	3.41	3.18	3.02	2.89	2.80	2.72	2.65	2.60	2.55	2.51	2.45	2.40	2.36	2.33	2.30	2.28	2.26
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
250	A [m ²]	0.021	0.029	0.036	0.044	0.051	0.059	0.066	0.074	0.081	0.089	0.096	0.104	0.111	0.126	0.141	0.156	0.171	0.186	0.201	0.216
	ζ	3.29	2.62	2.26	2.03	1.88	1.78	1.69	1.63	1.58	1.54	1.50	1.47	1.44	1.40	1.37	1.34	1.32	1.31	1.29	1.28
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
300	A [m ²]	0.028	0.038	0.048	0.058	0.068	0.078	0.088	0.098	0.108	0.118	0.128	0.138	0.148	0.168	0.188	0.208	0.228	0.248	0.268	0.288
	ζ	2.45	1.92	1.64	1.47	1.35	1.26	1.20	1.15	1.11	1.08	1.05	1.03	1.01	0.98	0.95	0.93	0.91	0.90	0.89	0.88
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
350	A [m ²]	0.035	0.048	0.060	0.073	0.085	0.098	0.11	0.123	0.135	0.148	0.16	0.173	0.185	0.21	0.235	0.26	0.285	0.31	0.335	0.36
	ζ	2.00	1.55	1.31	1.17	1.07	0.99	0.94	0.90	0.86	0.84	0.81	0.79	0.78	0.75	0.73	0.71	0.70	0.69	0.68	0.67
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
400	A [m ²]	0.042	0.057	0.072	0.087	0.102	0.117	0.132	0.147	0.162	0.177	0.192	0.207	0.222	0.252	0.282	0.312	0.342	0.372	0.402	0.432
	ζ	1.72	1.32	1.11	0.98	0.89	0.83	0.78	0.74	0.71	0.69	0.67	0.65	0.64	0.61	0.59	0.58	0.57	0.56	0.55	0.54
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
450	A [m ²]	0.049	0.067	0.084	0.102	0.119	0.137	0.154	0.172	0.189	0.207	0.224	0.242	0.259	0.294	0.329	0.364	0.399	0.434	0.469	0.504
	ζ	1.54	1.17	0.98	0.86	0.78	0.72	0.67	0.64	0.61	0.59	0.57	0.56	0.54	0.52	0.50	0.49	0.48	0.47	0.46	0.45
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
500	A [m ²]	0.056	0.076	0.096	0.116	0.136	0.156	0.176	0.196	0.216	0.236	0.256	0.276	0.296	0.336	0.376	0.416	0.456	0.496	0.536	0.576
	ζ	1.40	1.06	0.88	0.77	0.69	0.64	0.60	0.57	0.54	0.52	0.50	0.49	0.47	0.45	0.44	0.43	0.42	0.41	0.40	0.39
	K	5.5	3.5	2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
550	A [m ²]			0.108	0.131	0.153	0.176	0.198	0.221	0.243	0.266	0.288	0.311	0.333	0.378	0.423	0.468	0.513	0.558	0.603	0.648
	ζ			0.81	0.70	0.63	0.58	0.54	0.51	0.49	0.47	0.45	0.44	0.42	0.41	0.39	0.38	0.37	0.36	0.35	0.35
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
600	A [m ²]			0.12	0.145	0.17	0.195	0.22	0.245	0.27	0.295	0.32	0.345	0.37	0.42	0.47	0.52	0.57	0.62	0.67	0.72
	ζ			0.75	0.65	0.58	0.53	0.50	0.47	0.44	0.43	0.41	0.40	0.39	0.37	0.35	0.34	0.33	0.32	0.32	0.31
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
650	A [m ²]			0.132	0.16	0.187	0.215	0.242	0.27	0.297	0.325	0.352	0.38	0.407	0.462	0.517	0.572	0.627	0.682	0.737	0.792
	ζ			0.70	0.61	0.54	0.50	0.46	0.43	0.41	0.39	0.38	0.37	0.35	0.34	0.32	0.31	0.30	0.30	0.29	0.28
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
700	A [m ²]			0.144	0.174	0.204	0.234	0.264	0.294	0.324	0.354	0.384	0.414	0.444	0.504	0.564	0.624	0.684	0.744	0.804	0.864
	ζ			0.67	0.57	0.51	0.47	0.43	0.41	0.38	0.37	0.35	0.34	0.33	0.31	0.30	0.29	0.28	0.27	0.27	0.26
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
750	A [m ²]			0.156	0.189	0.221	0.254	0.286	0.319	0.351	0.384	0.416	0.449	0.481	0.546	0.611	0.676	0.741	0.806	0.871	0.936
	ζ			0.64	0.55	0.48	0.44	0.41	0.38	0.36	0.34	0.33	0.32	0.31	0.29	0.28	0.27	0.26	0.25	0.25	0.24
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
800	A [m ²]			0.168	0.203	0.238	0.273	0.308	0.343	0.378	0.413	0.448	0.483	0.518	0.588	0.658	0.728	0.798	0.868	0.938	1.008
	ζ			0.61	0.52	0.46	0.42	0.39	0.36	0.34	0.33	0.31	0.30	0.29	0.27	0.26	0.25	0.24	0.24	0.23	0.23
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1

- Installation of the fire damper in solid walls and ceiling slabs is approved with perimeter mortar infill (wet installation).
- Mortar-based installation into solid walls – EI 120 ($v_e i \leftrightarrow o$) S
- Mortar-based installation into solid ceiling slabs – EI 120 ($h_e i \leftrightarrow o$) S

Installation in horizontal and vertical ducts. Airflow direction is not critical.

Mortar-based installation

Requirements

- Solid walls or fire walls (if referred to as such) made of, for example, concrete, aerated concrete, masonry, or solid gypsum wallboards according to EN 12859 (without hollow spaces), gross density $\geq 500 \text{ kg/m}^3$, and a minimum thickness of 115 mm
- Solid ceiling slabs made of concrete or aerated concrete, gross density $\geq 600 \text{ kg/m}^3$, and a minimum thickness of 150 mm
- 75 mm minimum distance to load bearing structural elements, 40 mm minimum distance when installed in ceiling slabs
- 200 mm minimum distance between two fire dampers.

Recommendations

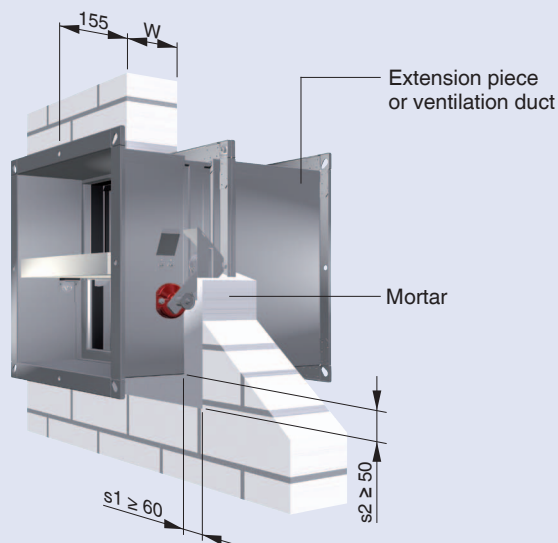
- Casing length $L = 500 \text{ mm}$, extension piece or duct should be used if the thickness of the wall exceeds 115 mm

Installation details

- An opening or a cut hole with a minimum width $B + 120 \text{ mm}$ and minimum height $H + 100 \text{ mm}$ is required; alternatively, the fire damper can be concreted into the wall or ceiling slab during construction
- Completely close off gap » $s1 \geq 60 \text{ mm}$ « or » $s2 \geq 50 \text{ mm}$ « with one of the following: mortar of group II, IIa, III or IIIa according to DIN 1053; fire protection mortar of group II or III or equivalent according to EN 998-2 (classes M 2.5 to 10); fire protection mortar of class M 2.5 or 10; gypsum mortar; or, if necessary, concrete.
The mortar bed depth must be at least 115 mm.

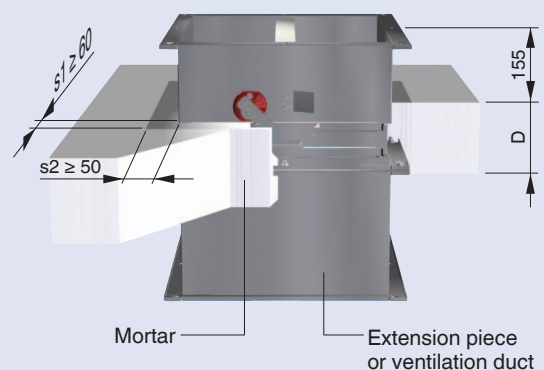
Wall installation

$W \geq 115 \text{ mm}$



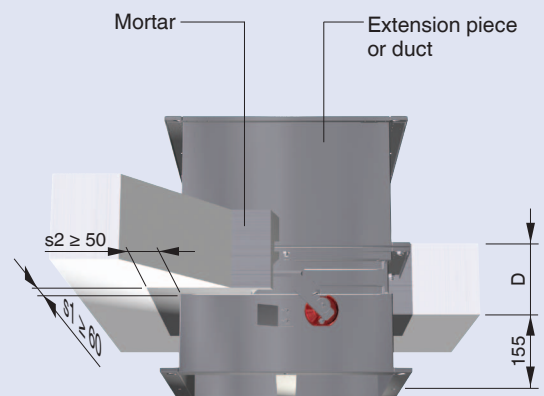
Ceiling slab installation, upright

$D \geq 150 \text{ mm}$



Ceiling slab installation, suspended

$D \geq 150 \text{ mm}$



Installation details

Remote from solid walls

Installation of the fire damper in horizontal sheet steel ducts and remote from solid walls is approved if the ducts have a fire-resistant cladding from the fire damper up to the solid wall and do not have any openings.

For installation in a horizontal duct, the damper blade shaft must be horizontal.

Requirements

- Use of certified insulation materials with adequate fire resistance rating.
- No openings in the insulated ducts between the fire damper and the solid wall
- Connection of rigid ducts to the non-insulated side of the fire damper using a flexible connector.

Installation details

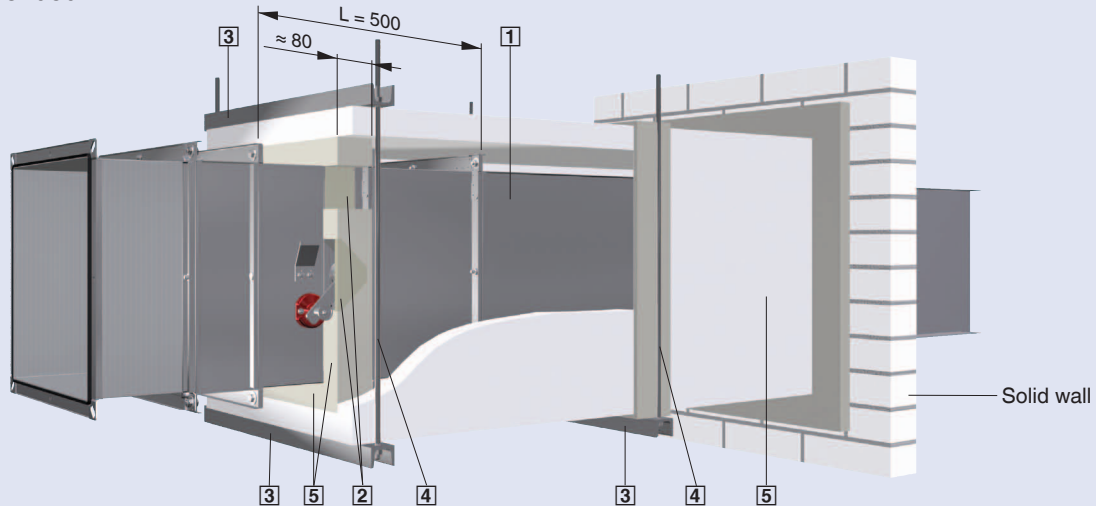
- For details of suspension systems see page 19
- Suspensions require adequately sized threaded rods. Threaded rods measuring > 1.5 m in length require fire resistant insulation.

- A fixing plate with multiple plugs and screws can be used to support heavy loads
- Suspensions can be fixed on top of the ceiling slab using nuts and washers made of galvanised steel
- Installation and fixing of the insulation must be as described in the manufacturer's proof of use report.
- A cross member is required as a support in the plane of the fire damper blade. If the duct is freely suspended, two cross members are required across the top and bottom, and these two cross members must tightly clamp the cladding to the fire damper casing.

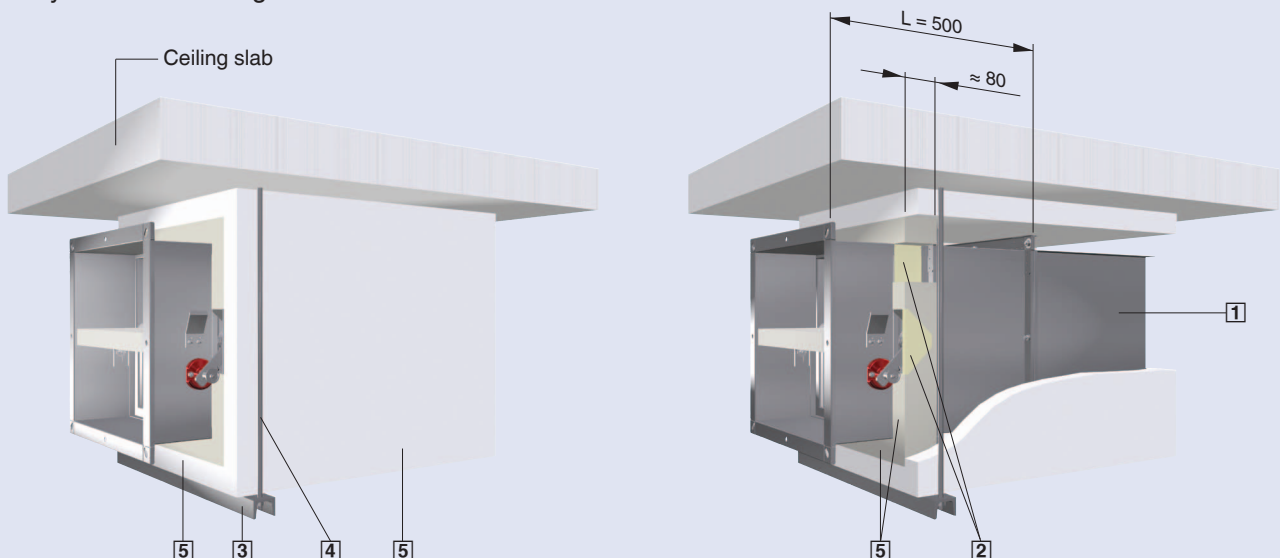
- 1 Duct
- 2 Insulation, mineral wool according to DIN 4102, material classification A1, non-combustible, gross density approx. 100 kg/m³, 65 × 10 mm
- 3 Cross member, U50 × 38 mm × 5 mm, galvanised or coated steel
- 4 Suspension
- 5 Cladding board

Connection to ventilation ducts made of sheet steel with outer cladding board

Freely suspended



Directly below the ceiling slab



- Installation of fire dampers remote from solid walls requires suspension support.
- For supporting heavy loads a fixing plate can be used.

Metal anchors

- Metal anchors with European technical approval (ETA) and with certified fire protection qualification: Anchors are installed and must have loads that do not exceed those in the approval certificate.
- Metal anchors with European technical approval (ETA) without certified fire protection qualification: Insert anchor, minimum size M8, to a depth twice as given in the approval certificate; the depth must be at least 60 mm; the anchor must not have a load exceeding 50 kg.
- If the load exceeds the limit, use a fixing plate.

Threaded rods

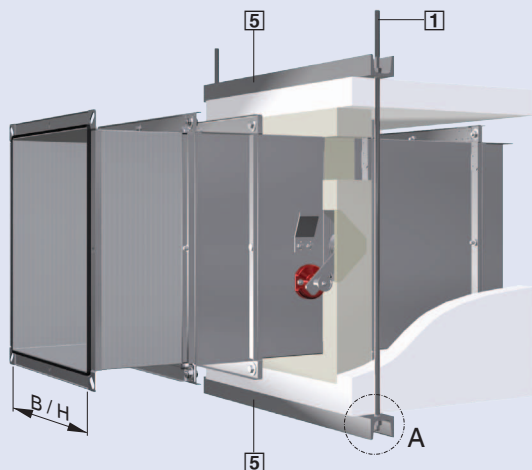
- Threaded rods measuring > 1.5 m in length require fire resistant insulation

Thread diameter	M8	M10	M12	M14	M16	M20
Maximum tensile load per threaded rod [kg]	22*	35*	52*	70*	96*	150*

* Weight of the fire damper, see page 5

- 1 Threaded rod, M8 to M20, galvanised steel
- 2 Washer, M8 to M20, galvanised steel
- 3 Hexagonal nut, M8 to M20, galvanised steel
- 4 Spacer tube, Ø30 × 33, galvanised steel
- 5 Cross member, U50 × 38 mm × 5 mm, galvanised or coated steel

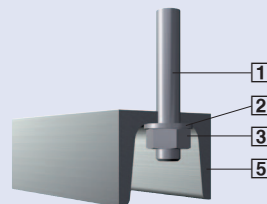
Suspension



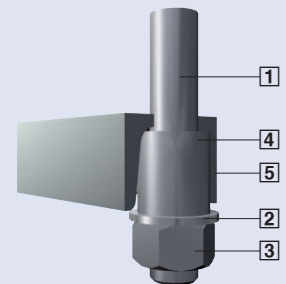
Detail A

Cross member

M8 to M14



M16 to M20



Installation details

Lightweight partition walls with metal support structure and cladding on both sides

Mortar-based installation (with perimeter mortar infill) of the fire damper in lightweight partition walls with metal support structure and cladding on both sides is approved.

- Mortar-based installation with cover strips – EI 120 ($v_e i \leftrightarrow o$) S
- Mortar-based installation without cover strips – EI 60 ($v_e i \leftrightarrow o$) S

Installation in horizontal ducts. Airflow direction is not critical. The damper blade shaft must be horizontal.

Mortar-based installation with cover strips – EI 120 ($v_e i \leftrightarrow o$) S

Requirements

- Lightweight partition walls with metal support structure, minimum thickness 125 mm as described in manufacturer's proof of use report, with mineral wool
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

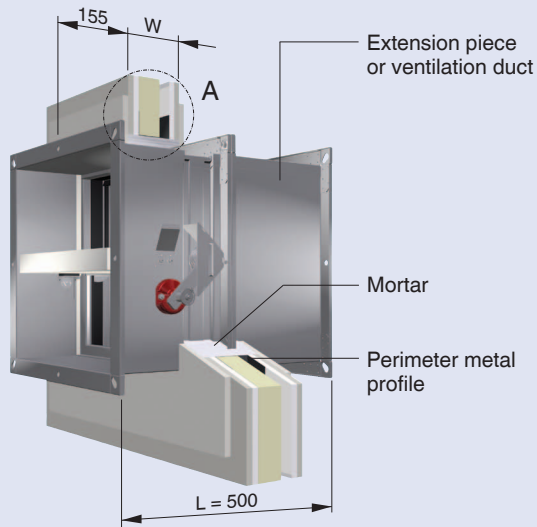
Recommendations

- Casing length $L = 500$ mm, extension piece or duct should be used if the thickness of the wall exceeds 115 mm

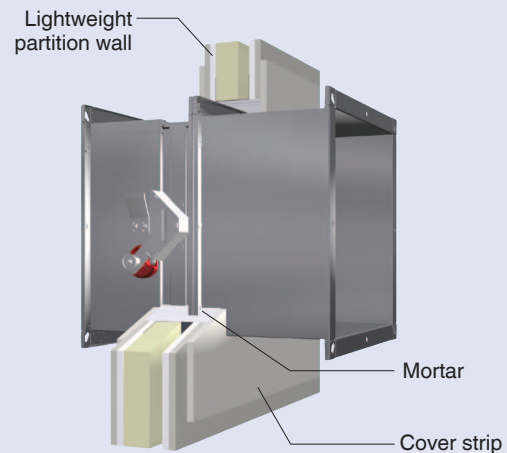
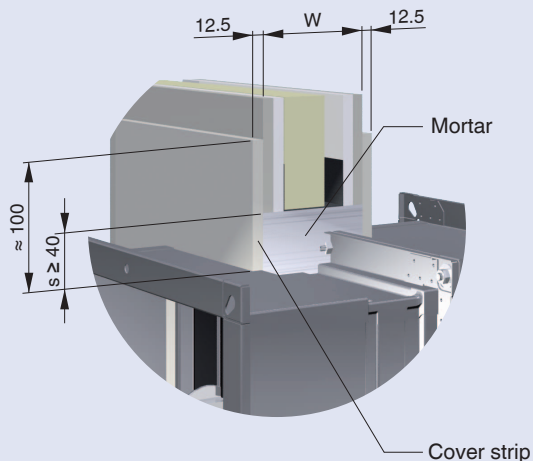
Installation details

- An installation opening with $B + 120$ mm and $H + 100$ mm is required
- Completely close off the perimeter gap »s« with one of the following: mortar of group II, IIa, III or IIIa according to DIN 1053; fire protection mortar of group II or III or equivalent according to EN 998-2 (classes M 2.5 to 10); fire protection mortar of class M 2.5 or 10; gypsum mortar; or, if necessary, concrete.
- The mortar bed depth is the same as the wall thickness.
- Finally plasterboard cover strips must be installed on both sides.

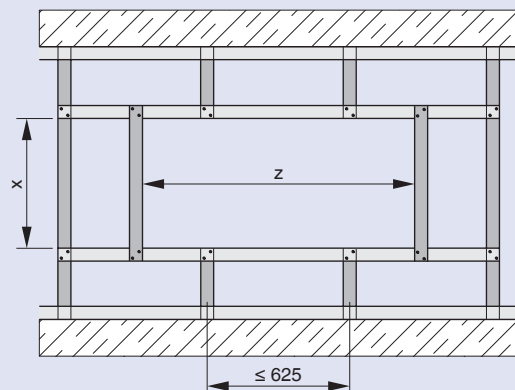
Mortar-based installation with cover strips



Detail A



Metal support structure for mortar-based installation



$$x \geq H + 100 \text{ mm}$$

$$z \geq B + 120 \text{ mm}$$

Installation details

Lightweight partition walls with metal support structure and cladding on both sides

Mortar-based installation without cover strips – EI 60 ($v_e i \leftrightarrow o$) S

Requirements

- Lightweight partition walls with metal support structure, minimum thickness 100 mm as described in manufacturer's proof of use report, without mineral wool
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

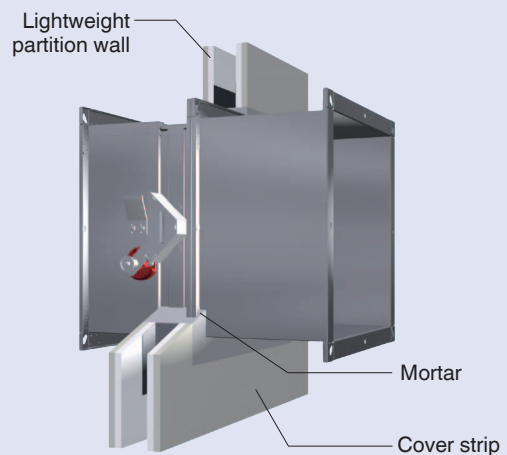
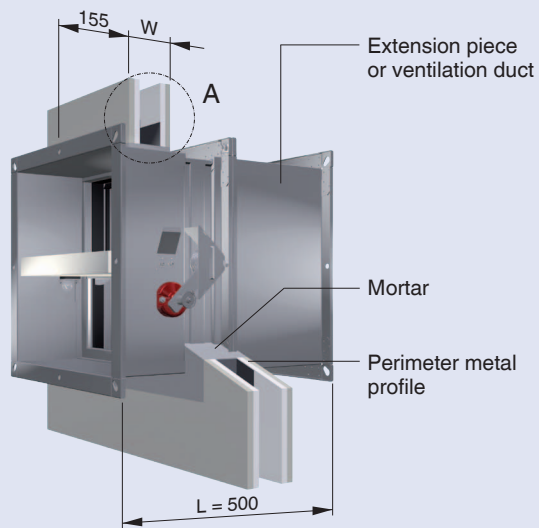
Recommendations

- Casing length $L = 500$ mm, extension piece or duct should be used if the thickness of the wall exceeds 115 mm

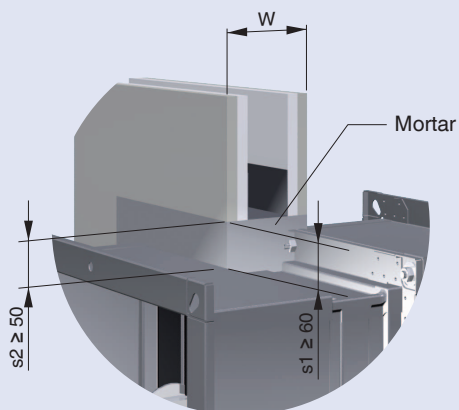
Installation details

- An installation opening with $B + 120$ mm and $H + 100$ mm is required
- Completely close off the perimeter gap »s« with one of the following: mortar of group II, IIa, III or IIIa according to DIN 1053; fire protection mortar of group II or III or equivalent according to EN 998-2 (classes M 2.5 to 10); fire protection mortar of class M 2.5 or 10; gypsum mortar; or, if necessary, concrete. The mortar bed depth is the same as the wall thickness.

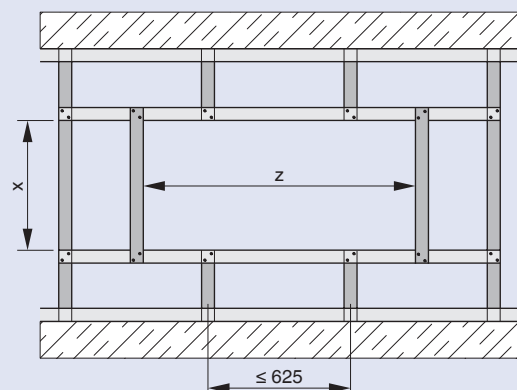
Mortar-based installation without cover strips



Detail A



Metal support structure for mortar-based installation



$$x \geq H + 100 \text{ mm}$$

$$z \geq B + 120 \text{ mm}$$

Order Details

Specification text *

Square or rectangular fire dampers in many dimension combinations for the isolation of duct penetrations between fire compartments.

Ready-for-operation unit includes a fire-resistant damper blade and a release mechanism.

Depending on application

EI 120 ($v_e, h_o i \leftrightarrow o$) S, EI 60 ($v_e i \leftarrow o$) S or EI 60 ($v_e i \leftrightarrow o$).

Tested for fire resistance properties to EN 1366-2.

With declaration of performance

DoP / FKA-EU / DE / 2013 / 001 and CE marking.

For installation in solid walls, ceiling slabs, lightweight partition walls and remote from solid walls.

Special features:

- Complies with the requirements of EN 15650
- Tested for fire resistance properties according to EN 1366-2
- Classified according to EN 13501-3
- Robust and rigid sheet steel casing
- Integration into the central BMS with TROXNETCOM

Differential pressure range 20 to 2000 Pa.

Closed blade air leakage according to EN 1751, minimum class 2.

Casing air leakage according to EN 1751, class B.

Fire damper variant with: spring return actuator with thermo-electric release mechanism. Two limit switches integrated into actuator for indicating damper blade positions OPEN and CLOSED.

Materials:

Casing made of galvanised sheet steel, damper blade made of a special insulating material, blade shafts made of stainless steel, bearings made of brass or stainless steel, damper blade seal made of polyurethane.

* Text for an FKA-EU with fusible link.

For texts applying to different construction variants, attachments and accessories, please refer to the design programme on our website.

Order code

FKA-EU - 1	/	BE	/	600 × 400 × 500	/	A0	/	Z43
1	2	3	4	5	6			

1 Type

2 Construction

- No entry: standard construction
- 1 Powder-coated casing
 - 2 Stainless steel casing
 - 7 Coated damper blade
 - 1-7 Powder-coated casing and coated damper blade
 - 2-7 Stainless steel casing and coated damper blade

3 Country of destination

- BE Belgium
- Other destination countries upon request

4 Nominal size [mm]

- B × H × L

5 Accessories

- No entry: none
- A0 to SS

6 Attachments

- Z00 to ZL08

Order example for FKA-EU with fusible link

Make: TROX

Type: FKA-EU / BE / 600 × 400 × 500 / Z00

Order example for FKA-EU, powder-coated, with cover grille on the operating side and spring return actuator 230 V AC

Make: TROX

Type: FKA-EU - 1 / BE / 1000 × 700 × 500 / A0 / Z43

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