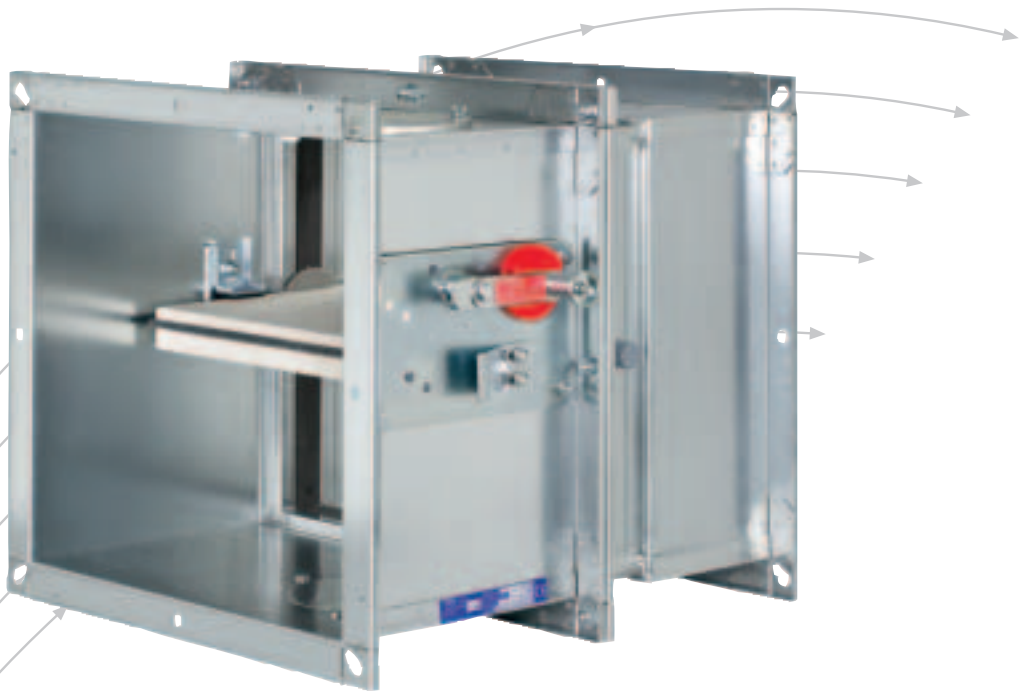


# Fire dampers

Type FK-K90  
with general building inspectorate licence

Z-41.3-321

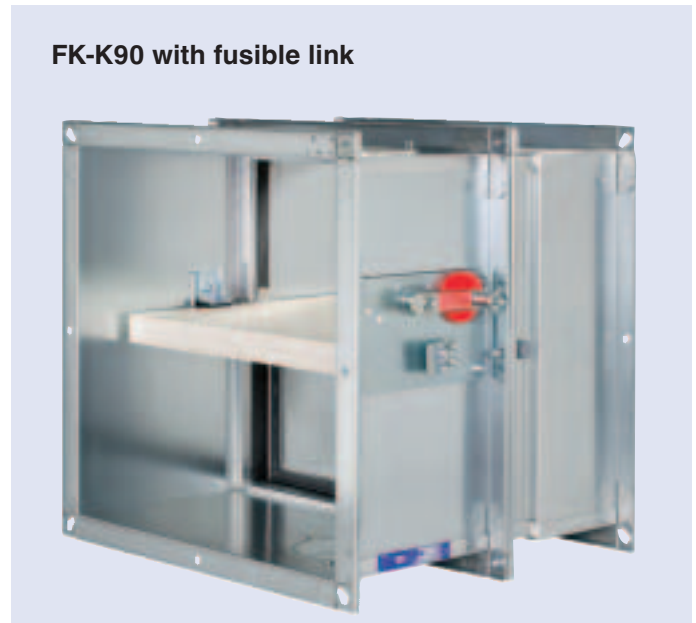
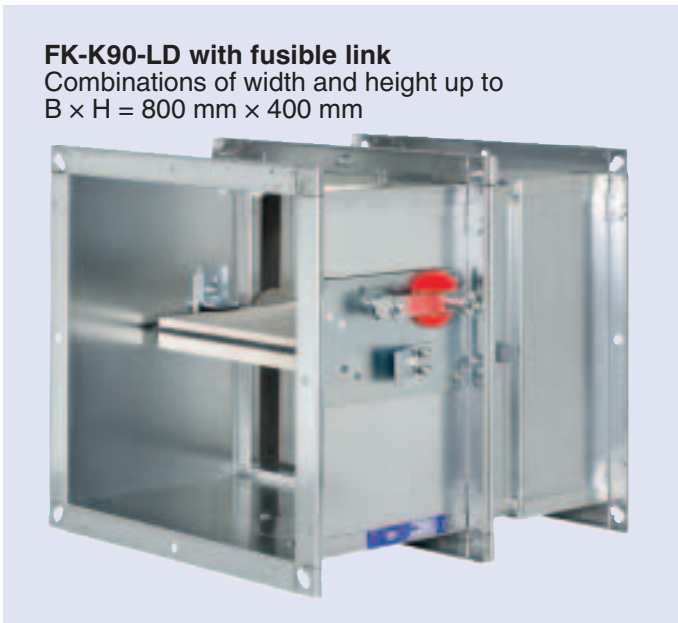


**TROX<sup>®</sup> TECHNIK**

The art of handling air

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Fire dampers shut automatically to prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments. FK-K90 fire dampers are tested according to DIN 4102 and EN 1366-2. Local requirements and building inspectorate approvals are essential.

Correct approved installation locations are directly in solid walls, ceiling slabs, gypsum wall boards, lightweight partitions and lightweight fire walls, directly on the face of solid walls and ceiling slabs, adjacent to solid walls and ceiling slabs and remote from solid walls.

Installation in vertical or horizontal ducts. Air flow direction is not critical. When installed in walls or ceiling slabs combustible ventilation ducting may be connected directly to the fire damper. In the case of fire, the damper is triggered at 72 °C or 95 °C (for use in warm air ventilation) either by a fusible link or thermoelectrically with a spring return actuator. The release mechanism is accessible and can be tested from the outside. The fire dampers have two inspection panels.

The fire resistance class of fire dampers type FK-K90 is dependent on the application.

## Special characteristics

- Tested for fire resistance properties according to DIN 4102 and EN 1366-2
- Construction (LD) has lower sound power level and differential pressure
- Equipped with spring return actuator, accessory ZEX1 approved for explosion-hazard areas
- Easy dry mortarless installation can be achieved with an installation kit
- Integration into the centralised BMS with TROXNETCOM

## General building inspectorate licence: Z-41.3-321

Further, current information in particular licence and operating manual and installation instructions can be found on our website.

Our “Easy Product Finder” design programme is also available on the Internet for the design and selection of our products.

**FK-K90-LD with spring return actuator**  
Combinations of width and height up to  
 $B \times H = 800 \text{ mm} \times 400 \text{ mm}$



**FK-K90 with spring return actuator**



**FK-K90-LD with blade bead seal**

- Combinations of width and height up to  $B \times H = 800 \text{ mm} \times 400 \text{ mm}$
- Release mechanisms:
  - Fusible link 72 °C or 95 °C for use in warm air ventilation.
  - Spring return actuator Type BLF or ExMax.
- Combinations of width and height up to  $B \times H = 800 \text{ mm} \times 400 \text{ mm}$  are supplied as standard construction for type FK-K90-LD.

**FK-K90 with landing angles with bead seals**

- All combinations of width and height, except widths 200 mm and 250 mm which only have a height of up to 500 mm.
- Release mechanisms:
  - Fusible link 72 °C or 95 °C for use in warm air ventilation.
  - Spring return actuator Type BLF, BF or ExMax.
- Combinations of width and height up to  $B \times H = 800 \text{ mm} \times 400 \text{ mm}$  are supplied as standard construction for type FK-K90-LD. Construction in this dimensional range can be supplied with landing angles with bead seals on request.

# Correct use

Fire dampers are products that require approval. The general and specific regulations of the general building inspectorate and the operating manual and installation instructions must be complied with. The general guidelines of DIN 31051 and EN 13306 are also applicable.



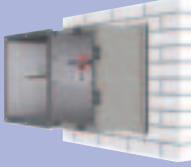

The functional reliability of fire dampers must be tested at least at six-monthly intervals. If two consecutive tests are successful, the next test can be conducted one year later.

In general, it is sufficient to close and reopen, fire dampers with spring return actuator, this can be by remote control.



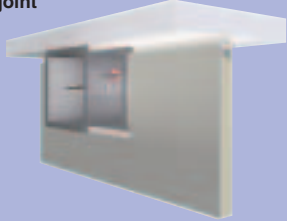



Fire dampers must be included in the regular cleaning schedule of the ventilation system.

## Design information

- The fire resistance class of FK-K90 for the following applications is K90.
- Installation in solid walls, ceiling slabs and lightweight partition walls with metal support structure and clad both sides and a fire resistance class lower than F90 is approved. In this case the fire damper has the same rating as the structure it is mounted in (e.g. wall F60 then fire damper K60)
- FK-K90 fire dampers are approved only for use in ventilation systems. Ducts must be connected at both ends or a duct on one end and a cover grille on the other end.
- Installation of fire dampers must be carried out in compliance with provisions of federal state law and the generally recognised codes of practice. In cases where fire dampers are installed outside Germany it is essential that local requirements and building inspectorate approvals are obtained.
- Ducting must be installed in such a manner that it does not impose any loads on the fire damper in the case of a fire.
- Flexible connectors must be used to connect solid ducting to the fire damper for particular applications.

Mounting location	Construction and building material	Minimum thickness in mm	Mortar based installation Casing length in mm		Dry mortarless installation Casing length in mm		Installation details Page
			L = 375	L = 500	L = 375	L = 500	
<b>Solid walls and ceilings</b> 	Solid walls of concrete, aerated concrete or made of brickwork	100	x	x	–	x <sup>1</sup>	27 to 30
	Solid ceiling slabs of concrete or aerated concrete	125	x	x	–	–	
<b>Wallboards</b> 	Gypsum wallboards to DIN 18163	100	x	x	–	–	
<b>Directly on the face of solid walls and ceiling slabs</b> 	Solid walls of concrete, aerated concrete or made of brickwork	100	–	–	x <sup>1</sup>	x <sup>1</sup>	
	Solid ceiling slabs of concrete or aerated concrete	125	–	–	x <sup>1</sup>	x <sup>1</sup>	
<b>Adjacent to solid walls and ceiling slabs</b> 	Solid walls of concrete, aerated concrete or made of brickwork	100	–	–	x	x	32
	Solid ceiling slabs of concrete or aerated concrete	125	–	–	x	x	

<sup>1</sup> with installation kit

Mounting location	Construction and building material	Minimum thickness in mm	Mortar based installation Casing length in mm		Dry mortarless installation Casing length in mm		Installation details Page
			L = 375	L = 500	L = 375	L = 500	
<b>Remote from solid walls</b> 	In fire-resistant ventilation ducting	-	-	-	x	x	34 to 35
<b>Lightweight partition walls with metal support structure and clad on both sides</b> 	Lightweight partition walls with mineral wool, to DIN 4102-4, Table 48 or with general appraisal certificate	100	x	x	-	x	36 to 38
<b>Lightweight partition walls with metal support structure and clad on both sides and with flexible ceiling joint</b> 	Lightweight partition walls to DIN 4102-4, Table 48 or with general appraisal certificate	100 <sup>2</sup>	-	-	-	x <sup>1</sup>	39
<b>Lightweight partition walls with metal support structure and clad on one side</b> 	Shaft walls	90	-	-	-	x <sup>1</sup>	40
<b>Lightweight partition walls without metal support structure and clad on one side</b> 	Shaft walls	40	-	-	-	x <sup>1</sup>	41
<b>In lightweight fire walls with metal support structure and clad on both sides</b> 	Fire walls with general appraisal certificate	110	x	x	-	x <sup>1</sup>	42 to 43

<sup>1</sup> with installation kit

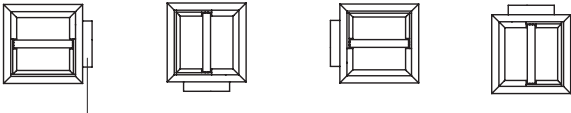
<sup>2</sup> Wall thickness = 100 mm

# Construction · Dimensions

## Characteristics

- Fire resistance class according to DIN 4102-6, K90
- Two casing lengths to allow for wall and ceiling slabs of various thicknesses
- Air flow in either direction
- Construction variant with damper bead seal (LD) has lower sound power level and differential pressure for combinations of width and weight up to  $B \times H = 800 \text{ mm} \times 400 \text{ mm}$
- Release temperature 72 °C or 95 °C for use in warm air ventilation

## Installation orientation for horizontal ducts

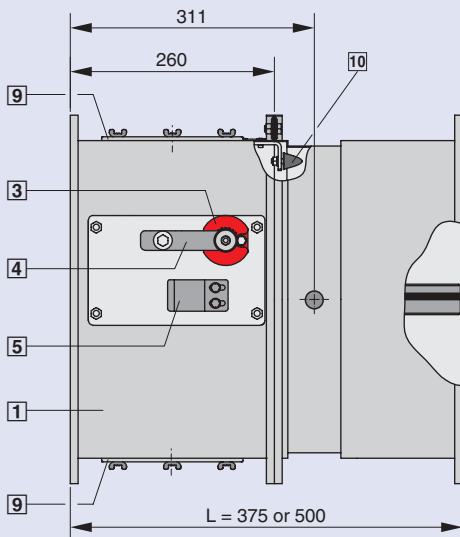


Release mechanism

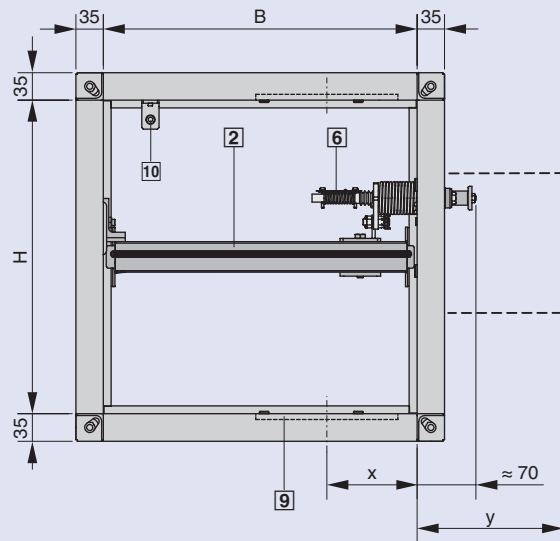
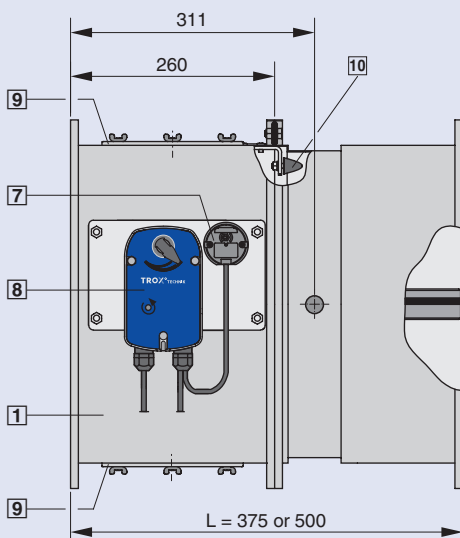
## Construction features

- Rectangular construction, rigid frame
- Connecting flanges drilled both ends, suitable for duct connection
- Two inspection panels
- Width and height in intermediate dimensions are available in increments of 1 mm

### FK-K90 with fusible link



### FK-K90 with spring return actuator



x 94 mm for  $B < 251 \text{ mm}$

115 mm for all other dimensions

y approx. 175 mm for fusible link, or spring return actuator types BLF and BF  
approx. 220 mm for spring return actuator type ExMax

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

- 1 Casing
- 2 Damper blade
- 3 Release mechanism
- 4 Handle
- 5 Interlock
- 6 Fusible link
- 7 Thermoelectric release mechanism
- 8 Spring return actuator
- 9 Inspection panel
- 10 Travel stop (only LD)

# Construction · Dimensions

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

Detailed listing on request.

## Materials

- Casing in galvanised sheet steel, with powder-coating RAL 7001 (-1) or in stainless steel 1.4301 (-2)
- Damper blade from special insulation material
- Damper blade clad in galvanised sheet steel or stainless steel
- Lacquer coating of damper blade RAL 7001
- Damper blade shafts and drive linkage in galvanised steel or stainless steel (-1, -2)
- Brass or stainless steel bearings
- Seals in polyurethane or elastomer

Construction variant 1		Order code
Casing	Damper blade	
Galvanised	Standard	
Powder-coated	Standard	-1
Stainless steel	Standard	-2
Galvanised	Galvanised sheet steel clad	-6
Galvanised	Coated	-7
Powder-coated	Stainless sheet steel clad	-1-6
Powder-coated	Coated	-1-7
Stainless steel	Stainless sheet steel clad	-2-6
Stainless steel	Coated	-2-7

Construction variant 2		Order code
Release temperature 95 °C		
with blade bead seal (not in combination with -6, -1-6, -2-6)		...-LD

## Dimensions

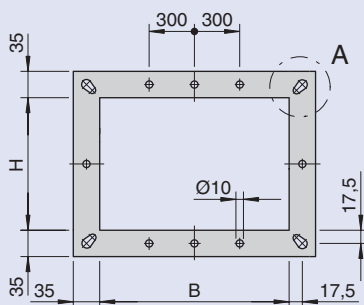
FK-K90 with fusible link Dimensions in mm / Weight in kg																				
H	B																			
	200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	10	11	12	13	15	16	17	18	19	20	22	23	24	26	28	30	31	33	35	38
250	11	12	13	15	16	17	18	19	21	22	24	25	26	28	30	32	34	36	38	41
300	12	13	14	16	17	18	19	21	23	24	25	26	28	30	31	34	36	38	40	44
350	13	15	16	17	18	20	22	23	25	26	27	29	30	32	34	37	39	41	44	48
400	15	16	17	18	20	22	24	26	27	28	30	31	32	35	38	40	43	46	48	52
450	16	17	18	20	22	24	26	28	29	29	31	32	34	37	40	44	47	49	52	57
500	17	18	19	22	24	26	28	29	30	31	33	34	36	39	45	47	50	53	56	62
550			21	23	26	28	29	30	32	34	35	37	38	43	47	50	54	57	60	67
600			23	25	27	29	30	31	34	36	37	39	42	46	50	54	57	61	64	71
650			24	26	28	29	31	33	35	37	40	42	45	49	53	57	61	64	68	75
700			25	27	28	31	33	35	37	40	43	45	48	52	56	60	64	67	71	78
750			26	28	30	32	34	37	39	42	45	48	50	55	59	63	66	69	73	81
800			27	29	32	34	36	38	42	45	47	50	52	57	62	65	68	71	75	84

FK-K90 with spring return actuator: weight + 3 kg.

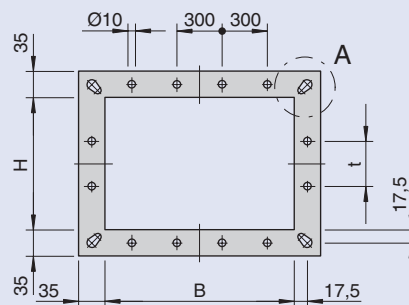
FK-K90-LD with blade bead seal in combinations of width and height up to B x H = 800 mm x 400 mm identified in the table by the blue box

## Flange drilling

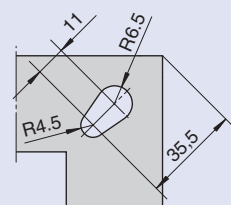
Odd number of holes



Even number of holes



Detail A - Corner holes



Dimensions in 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 per B-side*			1	1	1	2	2	3	3	4	4	
No. of holes per H-side*			1	1	1	2	2					

\* excluding corner holes

# Attachments

For dry mortarless installation in solid walls

An installation subframe and an installation kit are required for installation without mortar (dry installation) in solid walls.

Fire damper, installation subframe and installation kit are supplied loose. Assembly and installation by others.

Fire dampers with installation subframe and installation kit only in casing length  $L = 500$  mm.

The installation subframe is fixed in the wall with mortar-mix.

The fire damper is assembled with the installation kit to form a unit, pushed into the installation subframe and fixed with screws.

In case of fire an intumescent seal closes the remaining gap.

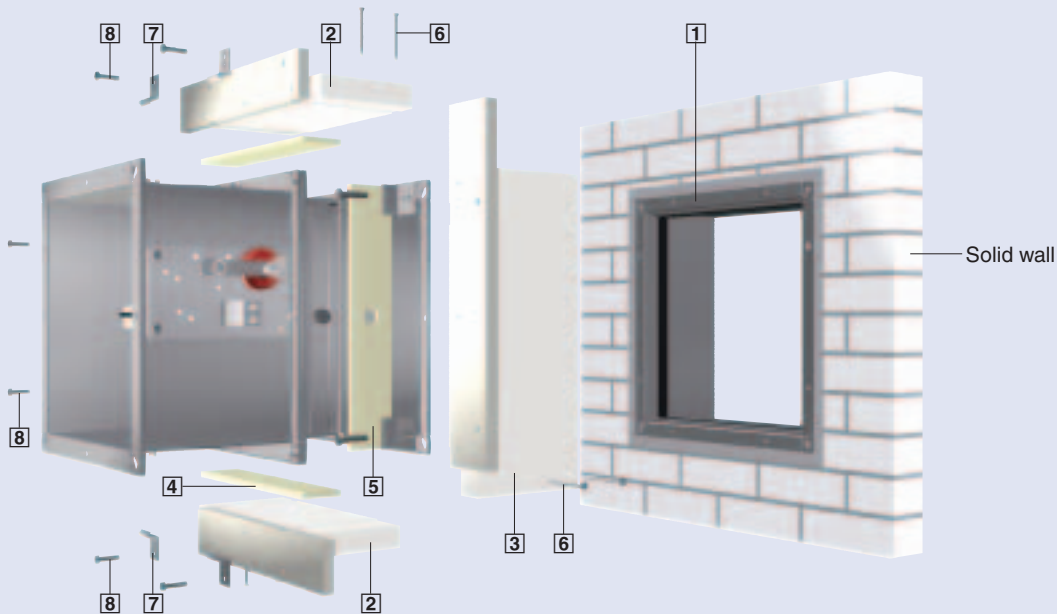
Fire dampers installed in this manner can be easily installed and also be removed.

Installation subframe and installation kit for dry mortarless installation in solid walls		Order code
L1 in mm	L in mm	
115	500	44
240	500	45

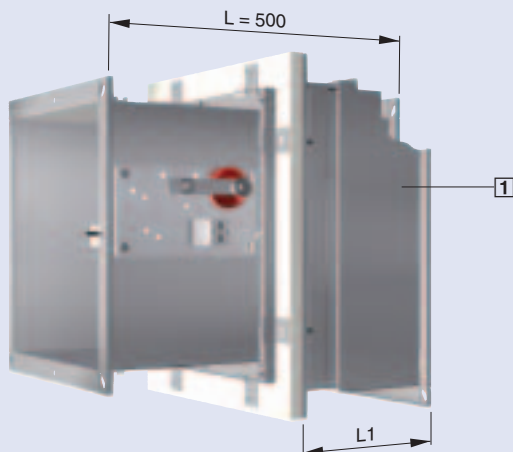
## Materials

- Installation subframe in galvanised steel with intumescent seal
- Installation kit from special insulation material and mineral wool strips
- Fixing elements in galvanised steel

### FK-K90 with Installation subframe and installation kit



### Assembled installation subframe and installation kit



Installation subframe and installation kit consisting of:

- 1 Installation subframe
- 2 Filler strip B-side (2 pieces)
- 3 Filler strip H-side (2 pieces)
- 4 Mineral wool B-side (2 pieces)
- 5 Mineral wool H-side (2 pieces)
- 6 Screw (8 pieces)
- 7 Clamp (4 – 16 pieces\*)
- 8 Screw (4 – 16 pieces\*)

\* Number of depends on size

# Attachments

For dry mortarless installation directly on the face of solid walls and ceiling slabs

A face subframe with panel cladding is required for installation without mortar (dry installation) directly on the face of solid walls and ceiling slabs.

Fire damper and face subframe are supplied loose. Assembly and installation by others.

The face subframe is fixed with plugs and screws directly on the face of the wall or ceiling slab. The fire damper is fixed to the face subframe and clad with the panels.

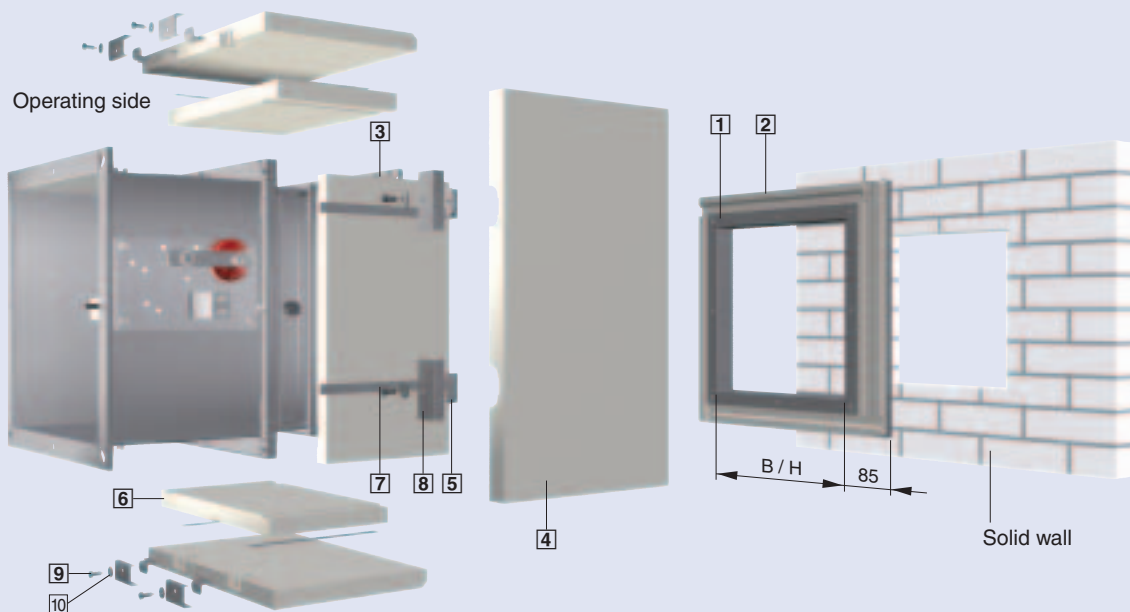
Rigid ducts must be connected with a flexible connector at the operating side.

## Materials

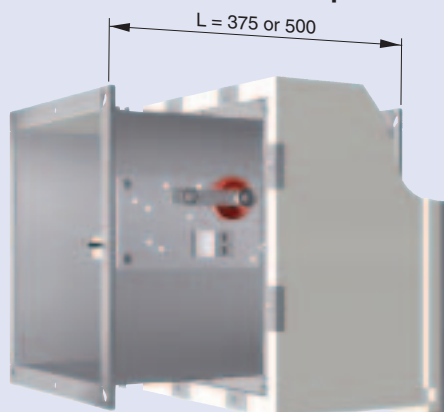
- Face subframe in galvanised steel (it is also powder coated silver-grey (RAL 7001) when used with powder coated (-1) and stainless steel (-2) dampers)
- Panel cladding using special insulation material
- Fixing elements in galvanised steel

Face subframe with panel cladding for installation without mortar directly on the face of solid walls and ceiling slabs		Order code
Flexible connectors	L in mm	
<b>FK-K90 · FK-K90-6 · FK-K90-7</b>		
–	375	22
at the operating side	375	23
–	500	41
at the operating side	500	42
<b>FK-K90-1 · FK-K90-2</b>		
–	375	72
at the operating side	375	73
–	500	91
at the operating side	500	92

## FK-K90 with face subframe and panel cladding



## Assembled face subframe with panel cladding



Face subframe and panel cladding consisting of:

- 1 Face frame
- 2 Strip (4 pieces)
- 3 Screw M8 with washer and nut (4 – 16 pieces\*)
- 4 Panel cladding (4 pieces)
- 5 Sheet metal angle bracket (4 – 14 pieces\*)
- 6 Insulation (4 pieces)
- 7 Sheet metal strip (8 pieces)
- 8 Retainer (4 – 14 pieces\*)
- 9 Screw (4 – 14 pieces\*)
- 10 Washer (4 – 14 pieces\*)

\* Number of depends on size

# Attachments

For dry mortarless installation in lightweight partition walls and lightweight fire walls

An installation kit is required for installation without mortar (dry installation) in lightweight partition walls and fire walls.

Fire damper and installation kit are supplied loose. Assembly and installation by others.

The fire damper is assembled with the installation kit to form a unit, pushed into the installation subframe and fixed with screws.

In case of fire an intumescent seal closes the remaining gap.

Rigid ducts must be connected with flexible connectors at the operating and installation side.

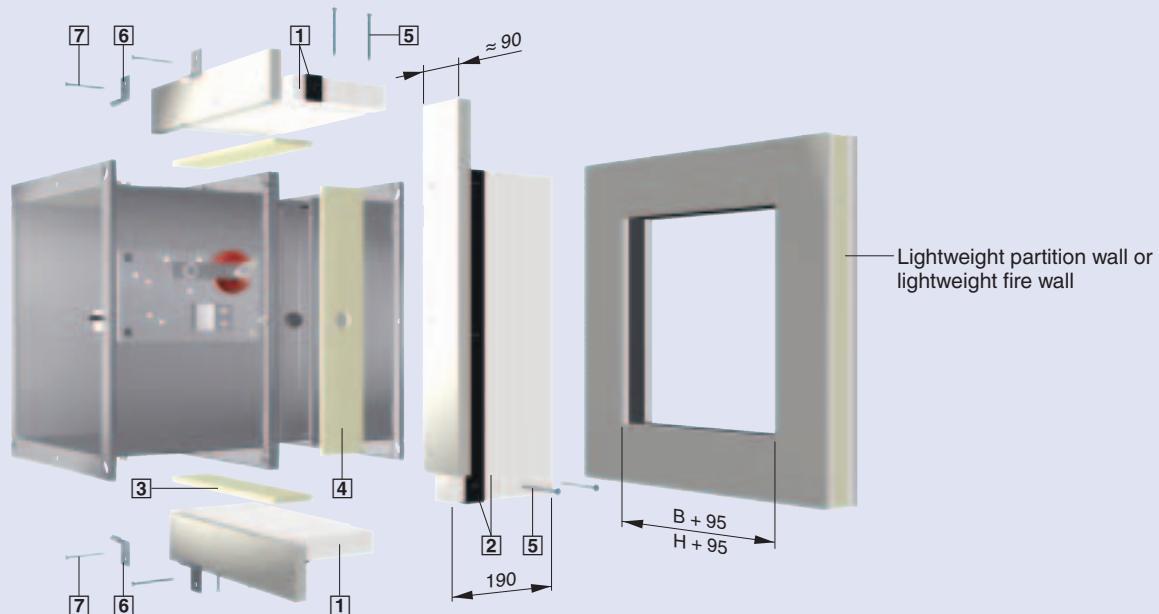
Fire dampers with installation kit only in casing length  $L = 500$  mm.

Installation kit for dry mortarless installation in lightweight partition walls and lightweight fire walls		Order code
Flexible connectors	L in mm	
FK-K90 · FK-K90-1 · FK-K90-2 · FK-K90-6 · FK-K90-7		
–	500	24
FK-K90 · FK-K90-6 · FK-K90-7		
at the operating and installation sides	500	58
FK-K90-1 · FK-K90-2		
at the operating and installation sides	500	A8

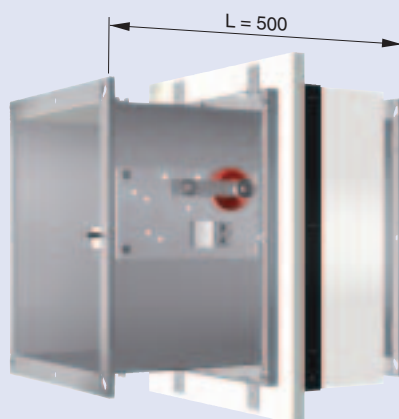
## Materials

- Installation kit from special insulation material with intumescent seal and mineral wool strip
- Fixing elements in galvanised steel

### FK-K90 with installation kit



### Assembled installation kit



Installation kit consisting of:

- 1 Filler strip with intumescent seal B-side (2 pieces)
- 2 Filler strip with intumescent seal H-side (2 pieces)
- 3 Mineral wool B-side (2 pieces)
- 4 Mineral wool H-side (2 pieces)
- 5 Screw (8 pieces)
- 6 Clamp (4 – 6 pieces\*)
- 7 Dry wall screw (4 – 6 pieces\*)

\* Number of depends on size

# Attachments

For dry mortarless installation in lightweight partition walls with flexible ceiling joint

An installation kit is required for installation without mortar (dry installation) in lightweight partition walls with flexible ceiling joint directly underneath solid ceiling slabs. The installation kit allows for subsidence of the slab whilst maintaining the sealing continuity around the fire damper.

Installation kit, extension piece and cross member underneath the installation kit are assembled at the factory to form a unit. The fire damper is fixed with the fixing elements of the installation kit to the ceiling slab by others.

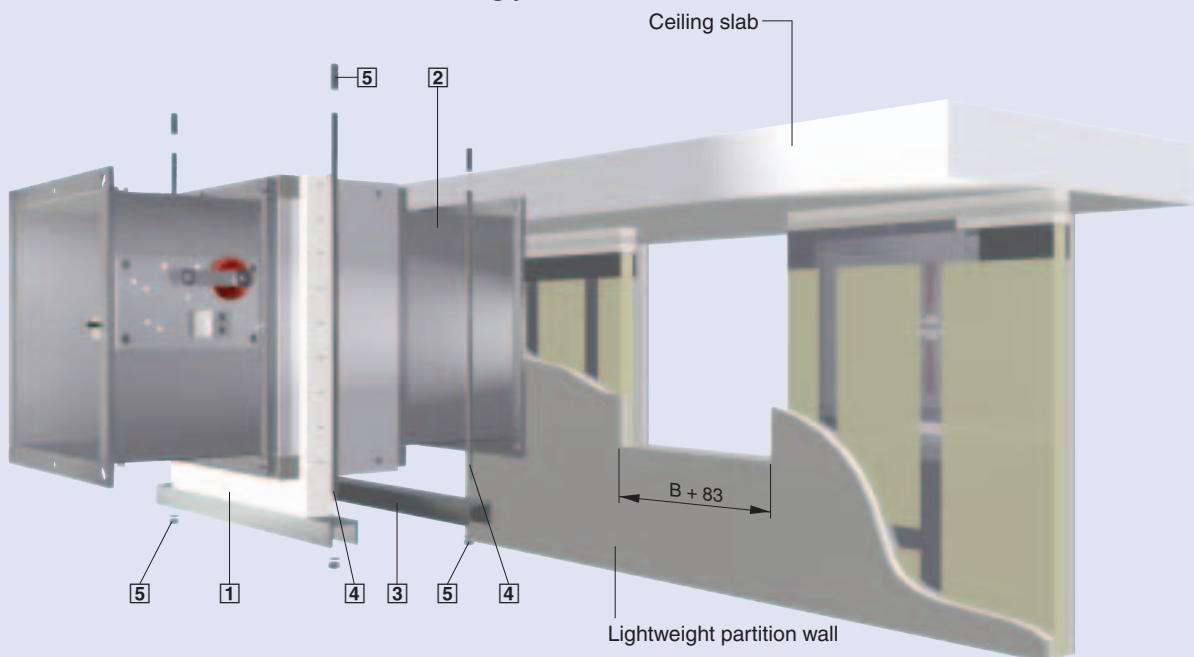
Rigid ducts must be connected with flexible connectors at the operating and installation side.

Installation kit for lightweight partition walls with flexible ceiling joint		Order code
Flexible connectors	L in mm	
<b>FK-K90 · FK-K90-6 · FK-K90-7</b>		
–	500	B1
at the operating and installation sides	500	B3
<b>FK-K90-1 · FK-K90-2</b>		
–	500	B2
at the operating and installation sides	500	B4

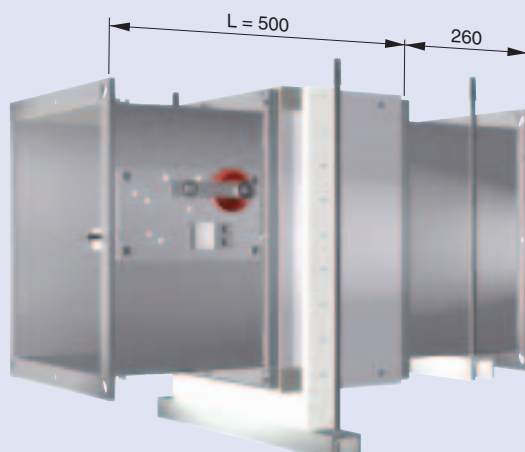
## Materials

- Installation subframe from special insulation material
- Cross members in galvanised steel
- Threaded rods in galvanised steel
- Fixing elements in galvanised steel
- Extension piece in galvanised steel

## FK-K90 with installation kit for flexible ceiling joint



## Assembled installation kit



Installation kit consisting of:

- 1 Installation subframe with cross member (1 piece)
- 2 Extension piece (1 piece)
- 3 Cross member (1 piece)
- 4 Threaded rod (4 pieces)
- 5 Screw, washer and nut (4 pieces of each)

# Attachments

## Cover grille

### Cover grille

If only one end is ducted on site, the other end must have a cover grille.

Due to the construction certain heights require an extension piece, 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 can also be supplied separately.

Further information about extension piece see page 15.

Cover grilles both ends are only approved for air transfer application with type FK-K90 to general building inspectorate licence Z-6.50-2031.

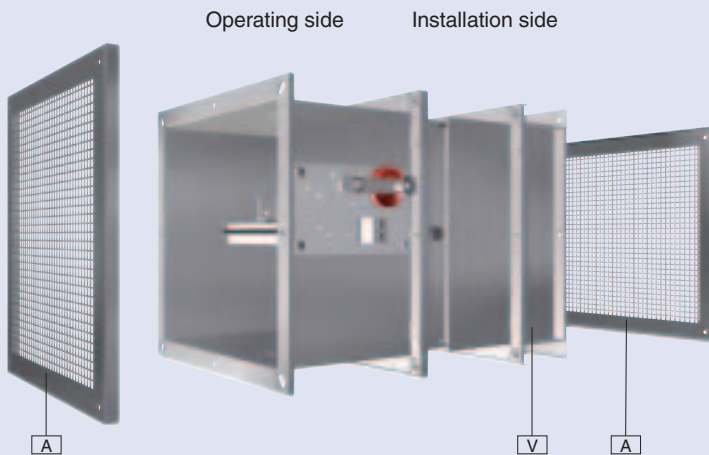
### Materials

- Cover grille 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		Order code
Operating side	Installation side	
<b>FK-K90 · FK-K90-6 · FK-K90-7</b>		
Cover grille	-	17
-	Cover grille	43
<b>FK-K90-1 · FK-K90-2</b>		
Cover grille	-	67
-	Cover grille	93

Location and length of extension pieces				
Dimensions in mm				
H	Operating side	Installation side	L	Order code
200 - 500	-	-	375 / 500	17 67
550 - 800	120	-	375 / 500	17 67
200 - 300	-	-	500	43 93
350 - 500	-	120	500	43 93
550 - 800	120	260	500	43 93

### Cover grille

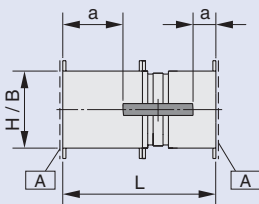


#### Note!

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

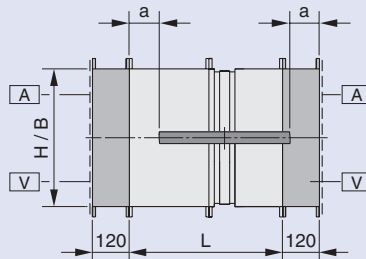
- A Cover grille, mesh size 10 mm × 10 mm, wire width 2 mm
- V Extension piece

### Without extension piece



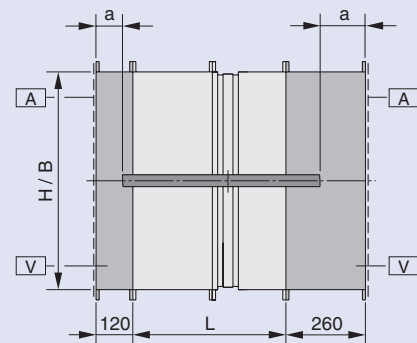
### With one extension piece

Operating or installation side



### With two extension pieces

Operating and installation side



### Circular spigot plate

Use of circular spigot plates facilitate the direct connection of circular ventilation ducting.

Due to the construction certain heights require an extension piece, 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 can also be supplied separately.

Further information about extension piece see page 15.

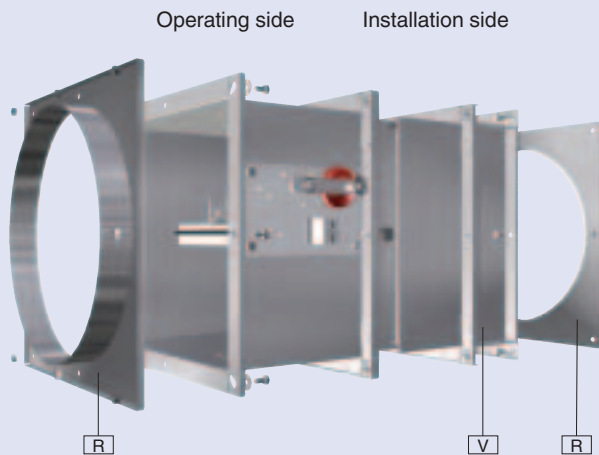
### Materials

- Circular spigot plate 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		Order code
Operating side	Installation side	
<b>FK-K90 · FK-K90-6 · FK-K90-7</b>		
Spigot plate	-	11
Spigot plate	Spigot plate	12
<b>FK-K90-1 · FK-K90-2</b>		
Spigot plate	-	61
Spigot plate	Spigot plate	62

Location and length of extension pieces				
Dimensions in mm				
H	Operating side	Installation side	L	Order code
200 – 500	-	-	375 / 500	11 61
550 – 800	120	-	375 / 500	11 61
200 – 300	-	-	500	12 62
350 – 500	-	120	500	12 62
550 – 800	120	260	500	12 62

### Circular spigot plate

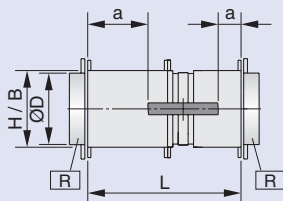


#### Note!

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

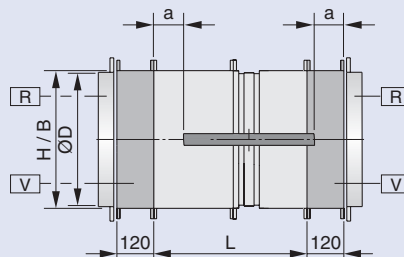
- R Circular spigot plate
- V Extension piece

#### Without extension piece



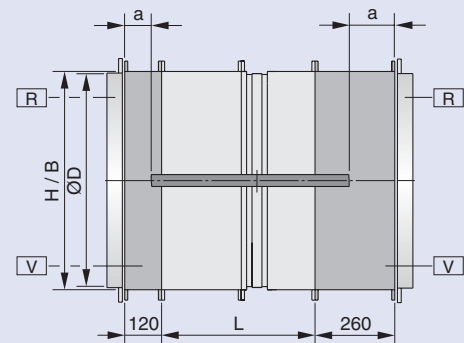
#### With one extension piece

Operating or installation side



#### With two extension pieces

Operating and installation side



#### Dimensions in 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	298	348	398	448	498	548	598	648	698	748	798

# Attachments

## Flexible connectors

### Flexible connectors

Ducting must be installed in such a manner that it does not impose any loads on the fire damper in the case of a fire. If fire dampers are installed in the following applications connection of rigid ducting can only be made using flexible connectors. The applications are, firstly partial mortaring into solid walls or ceiling slabs, secondly directly on the face of or adjacent to solid walls or ceiling slabs, thirdly remote from solid walls and finally in gypsum wall boards, lightweight partitions or fire walls. Flexible ducting may connected directly to the fire damper. Due to the construction certain heights require an extension piece, see table.

The fixing holes in the flexible connectors and extension pieces match those in the fire damper flanges. Flexible connectors can also be supplied separately.

Further information about extension piece see page 15.

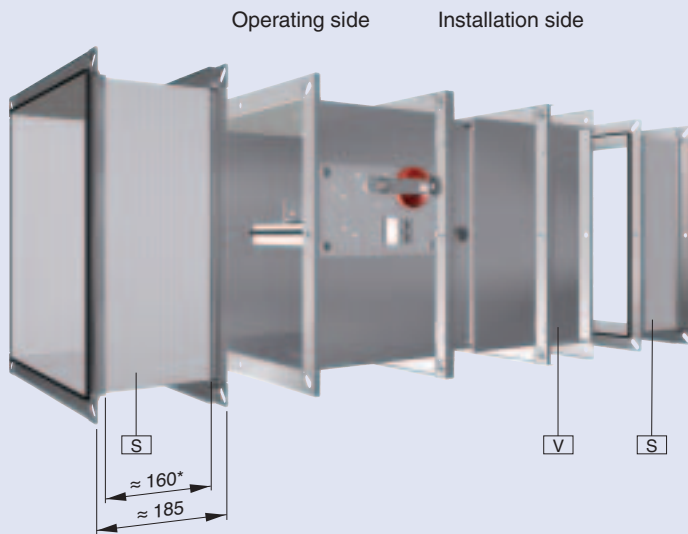
### Materials

- Flexible connectors in galvanised steel and fibre-reinforced plastic

Flexible connectors		Order code
Operating side	Installation side	
<b>FK-K90 · FK-K90-6 · FK-K90-7</b>		
Flexible connectors	–	19
Flexible connectors	Flexible connectors	20
<b>FK-K90-1 · FK-K90-2</b>		
Flexible connectors	–	69
Flexible connectors	Flexible connectors	70

Location and length of extension pieces				
Dimensions in mm				
H	Operating side	Installation side	L	Order code
200 – 500	–	–	375 / 500	19 69
550 – 800	120	–	375 / 500	19 69
200 – 300	–	–	500	20 70
350 – 500	–	120	500	20 70
550 – 800	120	260	500	20 70

### Flexible connectors



#### Note!

- Extension pieces are supplied factory assembled. Flexible connectors are supplied loose, connection materials are supplied by others.
- Minimum distance  
Between the open damper blade edge and the flexible connector should be a distance of »a« approx. 50 mm.

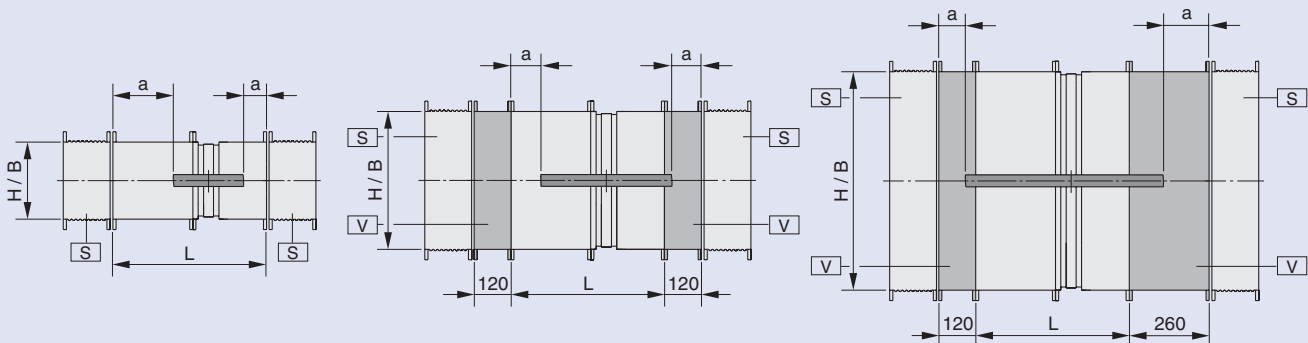
- S Flexible connectors
- V Extension piece

\* flexible range  $\geq$  100 mm in installed state

#### Without extension piece

#### With one extension piece Operating or installation side

#### With two extension pieces Operating and installation side



### Extension piece

When using cover grilles, circular spigot plates or flexible connectors an extension piece is required for certain heights. Fire dampers with these attachments are supplied with extension piece.

Flexible connectors can also be supplied separately.

### Minimum distance

Between the open damper blade edge and the cover grille, circular spigot plate or flexible connector should be a distance of approx. »a« = 50 mm.

Further information about cover grilles, circular spigot plates and flexible connectors see pages 12 to 14.

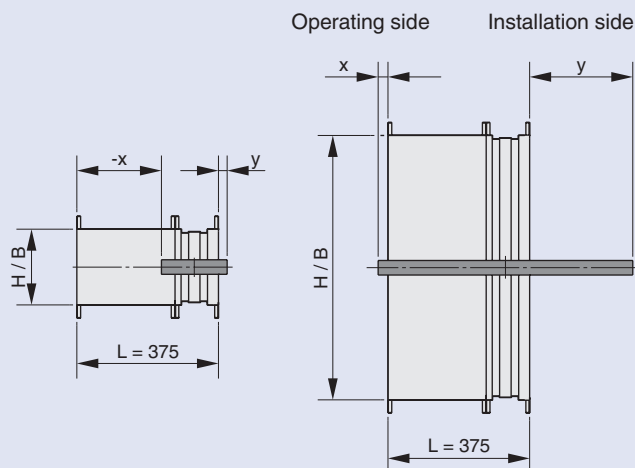
Dimensions in mm													
H	200	250	300	350	400	450	500	550	600	650	700	750	800
x	-224	-199	-174	-149	-124	-99	-74	-49	-24	1	26	51	76
y													
L = 375	23	48	73	98	123	148	173	198	223	248	273	298	323
L = 500	-102	-77	-52	-27	-2	23	48	73	98	123	148	173	198

 = extension piece required

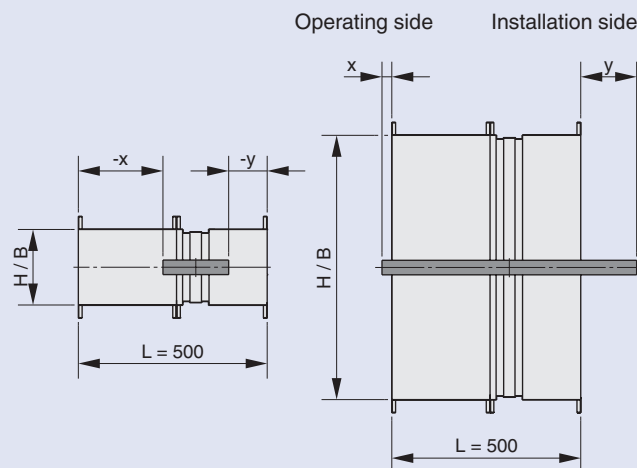
### Materials

- 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)

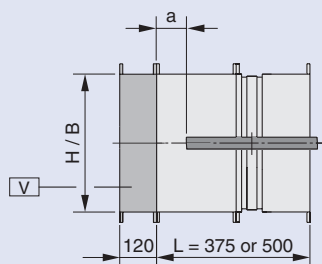
**FK-K90**  
L = 375 mm



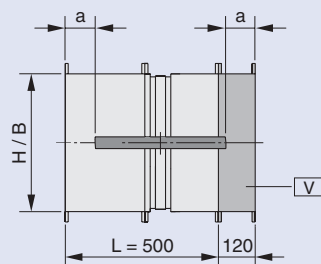
**FK-K90**  
L = 500 mm



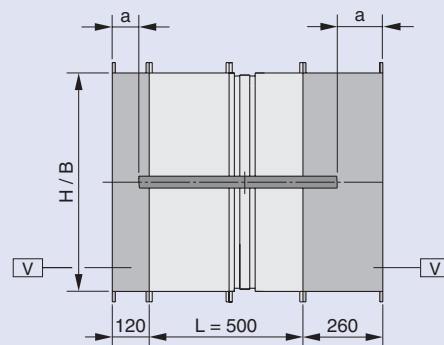
**With one extension piece**  
Operating side




**With one extension piece**  
Installation side



**With two extension pieces**  
Operating and installation side



 Flexible connector, on operating and/or installation side

# Accessories

## Limit switch

### FK-K90 with fusible link

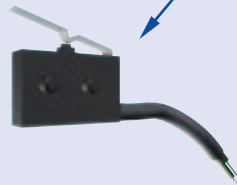
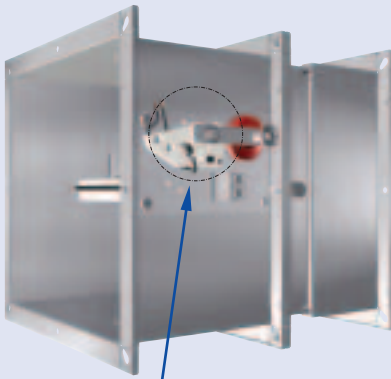
Limit switches with potential-free contacts enable the damper blade position indication. Within the range of the switch rating, relays or indication lights for fire alarm systems can be used. One limit switch each is required for damper blade positions OPEN and CLOSED.

Fire dampers with a fusible link can be supplied with one or two limit switches or they can be installed later.

Accessories	Order code
Limit switch damper blade position "CLOSED"	Z01
Limit switch damper blade position "OPEN"	Z02
Limit switches damper blade position "CLOSED" and "OPEN"	Z03

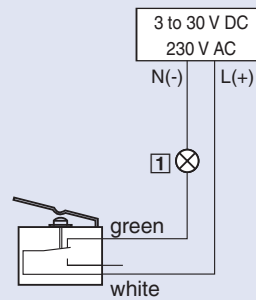
Limit switch	
Connecting cable length / cross section	1 m / 3 x 0.34 mm <sup>2</sup>
Protection level	IP 66
Type of contact	1 change-over contact, galv. gold-plated
Max. switching current	0.5 A
Max. switching voltage	30 V DC, 250 V AC
Contact resistance	approx. 30 mΩ

### Limit switch

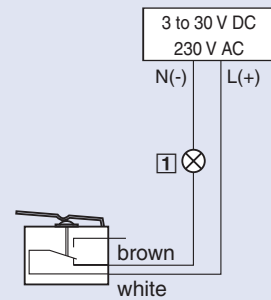


### Wiring Examples

#### Limit switch not actuated



#### Limit switch actuated



1 Indicator light or relay, supplied by others

### FK-K90 in OPEN position



Damper blade position indicator	Limit switch
OPEN	actuated
CLOSED	non-actuated

### FK-K90 in CLOSED position



Damper blade position indicator	Limit switch
OPEN	non-actuated
CLOSED	actuated

### FK-K90 with spring return actuator type BLF

for combinations of width and height up to  
 $B \times H = 800 \text{ mm} \times 400 \text{ mm}$

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 actuators can be functionally checked OPEN/CLOSED/OPEN.

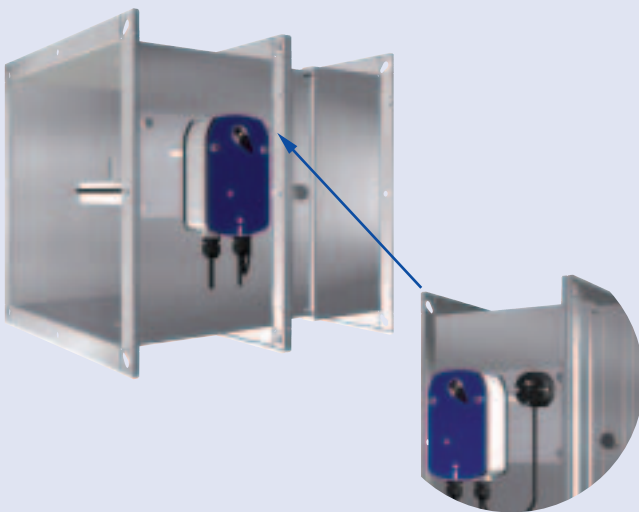
Two limit switches are integrated into the actuator. The connecting cables of the BLF24-T-ST TR are fitted with plugs. The connection to the TROX AS-i bus system can be quickly made.

A conversion kit is available for adding an actuator.

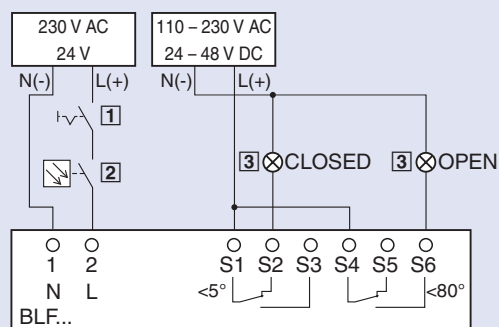
Accessories	Order code
BLF230-T TR	Z43
BLF24-T-ST TR	Z45

Spring return actuator type 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	
Run 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 $\Omega$	
IEC protection class		II	III
Protection level		IP54	
Connecting cable	Length / Cross section	1 m / 2 x 0.75 mm	

### Spring return actuator Type BLF...



### Wiring example CLOSED position



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

# Accessories

## Spring return actuator

### FK-K90 with spring return actuator type 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 actuators can be functionally checked OPEN/CLOSED/OPEN.

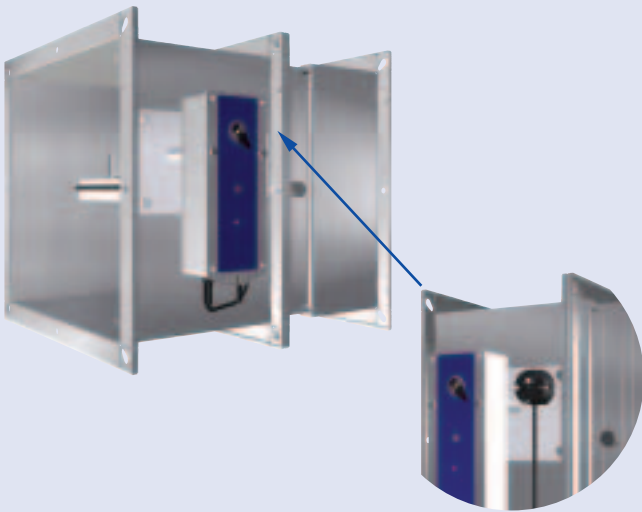
Two limit switches are integrated into the actuator. The connecting cables of the BF24-T-ST TR are fitted with plugs. The connection to the TROX AS-i bus system can be quickly made.

A conversion kit is available for adding an actuator.

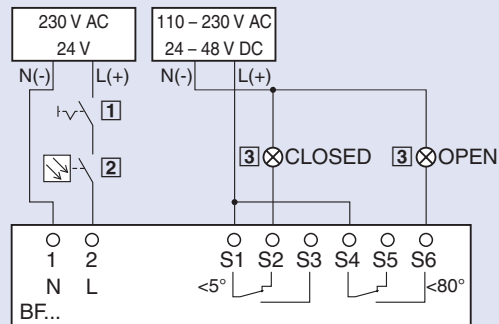
Accessories	Order code
BF230-T TR	Z43
BF24-T-ST TR	Z45

Spring return actuator type 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
Run 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 $\Omega$	
	IEC protection class	II	III
Protection level		IP54	
Connecting cable	Length / Cross section	1 m / 2 x 0.75 mm	

### Spring return actuator type BF..



### Wiring example CLOSED position



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

# Accessories

## Spring return actuator (Ex)

### FK-K90 with spring return actuator type ExMax

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 actuators can be functionally checked OPEN/CLOSED/OPEN.

Two limit switches are integrated into the actuator. The electrical connection is carried out in the terminal box.

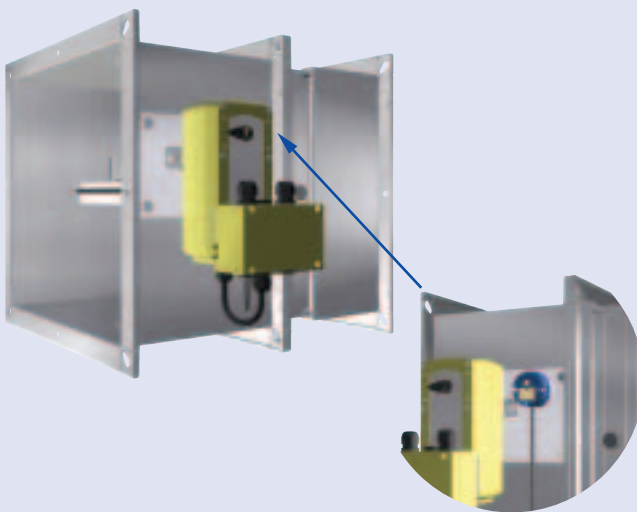
Release temperature of the spring return actuator 72 °C.

ATEX-certified to guideline 94/9/EG by Electrosuisse  
SEV certification number SEV 05 ATEX 0112.

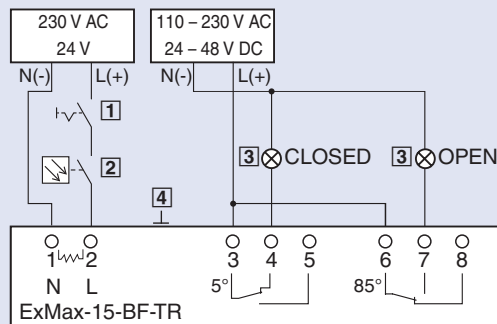
Accessories	Order code
ExMax-15-BF-TR	ZEX1

Spring return actuator type ExMax-15-BF-TR			
Supply voltage	24 – 230 V AC/DC, each ±10 %, actuator self adjusting 50 – 60 Hz ±20 %		
Power rating	16 W / 15 VA		
Switch on current (< 1 s)	2 A		
Run time	Motor / spring return	approx. 30 s / approx. 10 s	
	Type of contact	2 change-over contacts	
Limit switch	Switching voltage	230 V AC / 24 V DC	
	Switching current	0.5 A / 3 A	
IEC protection class	I (earthed)		
Protection level	IP66		
ATEX marking		<b>Gases</b> Zones 1 / 2	<b>Dusts</b> Zone 22
	Spring return actuator	II2G Ex d[ia] IIC T8/T5	II2D Ex tD A21 [iaD] IP66 T80°C
	FireSafe	II2G EEx d ia IIC T6	II3D IP65 T80°C
	Terminal box	II2G EEx e IIC T6	II2D IP66 T85°C

### Spring return actuator type ExMax



### Wiring example CLOSED position



- 1 Switch for opening and closing, supplied by others
- 2 Optional release mechanism, e.g. TROX smoke detector Type RM-O-3-D or RM-O-VS-D
- 3 Indicator light or relay, supplied by others
- 4 Terminal for potential equalisation 4 mm<sup>2</sup>

# Accessories

TROXNETCOM

## FK-K90 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 attached accessories 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) are to be connected by the customer.

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.

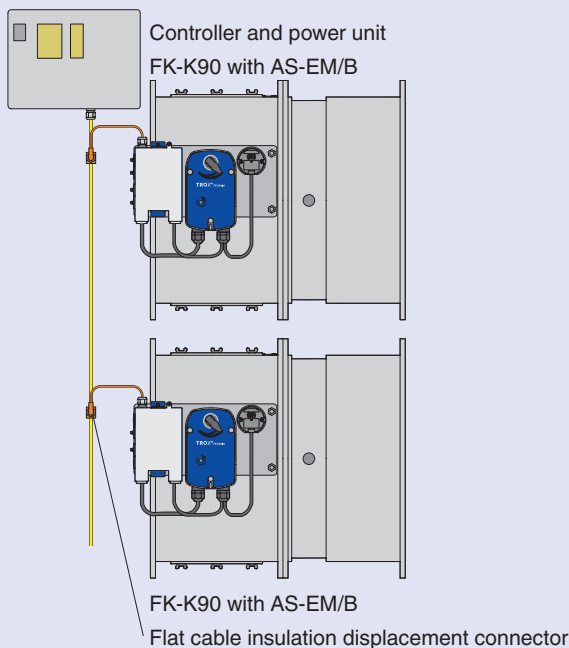
Accessories	Order code
AS-EM/B and BLF24-T-ST TR* or BF24-T-ST TR	ZA03

Accessories	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 mm x 400 mm

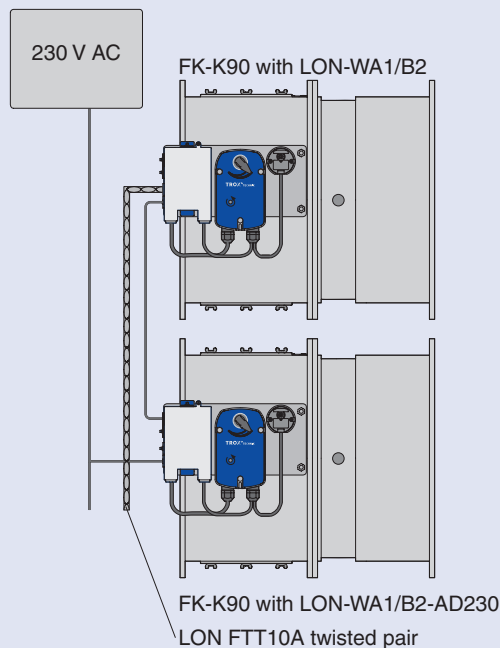
LON and LONMARK are a standardised local operating network system with manufacturer-independent communications. Data is transferred by a microprocessor supplied by Echelon Corporation using a unified protocol. Standards are defined in accordance with LONMARK to ensure that products are compatible.

### 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 run 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**  
For the control of 1 or 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

Further information can be found on our website.

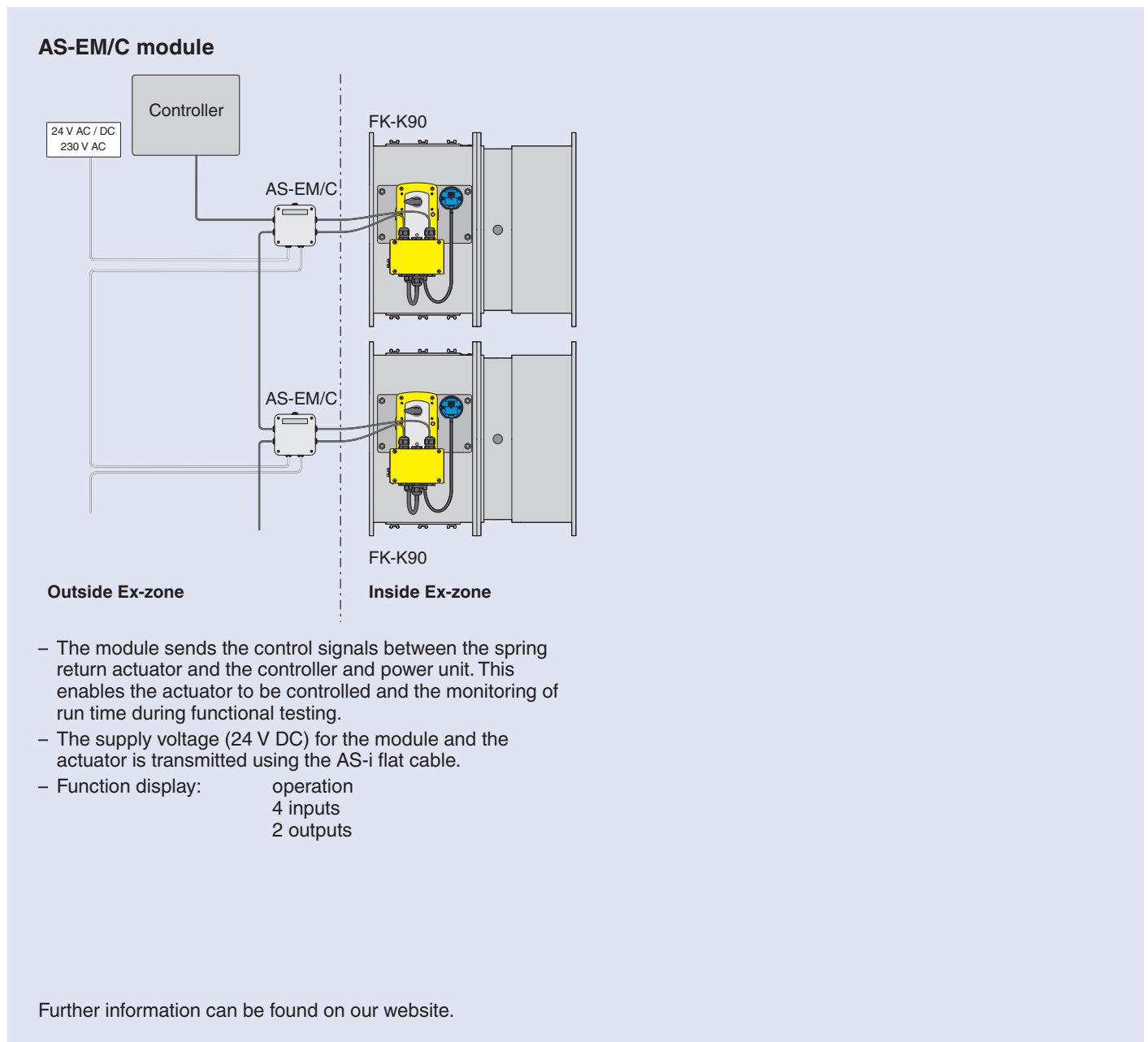
### FK-K90 with spring return actuator (Ex) and TROXNETCOM

The fire dampers with spring return actuator ExMax-15-BF-TR and module AS-EM/C as attached accessories form a functional unit ready for operation by an automatic fire damper controller. Installation outside of the Ex-zone 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.

Accessories	Order code
AS-interface module	ZEX2



# Accessories

## Smoke detectors

To prevent smoke from spreading in buildings through the ventilation system, it is extremely important that the smoke is detected at an early stage.

Smoke detectors types RM-O-3-D and RM-O-VS-D operate on the principle of light scattering and detect the smoke regardless of its temperature so that the fire dampers close before the release temperature is reached.

If the air contains suspended particles, as is the case with smoke, beams of light are deflected off these. A sensor (photodiode), which does not receive light in clear air, is illuminated by the scattered light. The release of the fire or smoke control damper is activated when the brightness of the scattered light exceeds a certain threshold.

Accessories	Order code
Smoke detector	RM-O-3-D
Smoke detector with air flow monitor	RM-O-VS-D

Smoke detectors are accessories and to be ordered separately.

### Smoke detector type RM-O-3-D



- Smoke detector for fire and smoke control dampers
- General building inspectorate licence: Z-78.6-125
- For air velocities from 1 to 20 m/s
- Independent of the air flow direction
- Supply voltage 230 V AC, 50/60 Hz
- Potential-free signal and alarm relays
- Integrated signal lights
- Contamination level indicator
- Automatic adjustment of alarm threshold
- Long service life
- Correct use and further technical data see leaflet 4/6.3/EN/..

### Smoke detector type RM-O-VS-D with air flow monitor



- Smoke detector for fire and smoke control dampers
- General building inspectorate licence Z-78.6-67
- For air velocities from 1 to 20 m/s
- Independent of the air flow direction
- Air flow monitoring with lower warning limit 2 m/s
- Supply voltage 230 V AC, 50/60 Hz
- Potential-free signal and alarm relays
- Integrated signal lights
- Contamination level indicator
- Automatic adjustment of alarm threshold
- Long service life
- Correct use and further technical data see leaflet 4/6.2/EN/..

## Nomenclature

B in mm : Width  
 H in mm : Height  
 A in m<sup>2</sup> : Free cross sectional area  
 $\dot{V}$  in m<sup>3</sup>/h : Flow rate  
 $v_A$  in m/s : Air velocity based on B x H  
 $\Delta p_t$  in Pa : Total pressure differential (duct installation)

$$\Delta p_t = \zeta \times \rho / 2 \times v_A^2$$

$\zeta$  : Resistance coefficient (fully ducted)  
 $\rho$  in kg/m<sup>3</sup> : Air density (approx. 1.2 at 20 °C)  
 $f_m$  in Hz : Octave band centre frequency  
 $L_{WA}$  in dB(A) : Sound power level of the air-regenerated noise in the duct  
 $L_W$  in dB : Octave band sound power level  
 $L_W = L_{WA} +$  correction value to obtain octave level (see tables 4 and 5)  
 $L_{WNC}$  : NC rating of the sound power level  
 $L_{WNC} \approx L_{WA} - 5$

K : Correction value for damper width  
 B ≠ 450 mm or 600 mm (see table 6)

All sound power levels are based on 1 pW.

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

Selecting fire dampers using the quick selection table leads rapidly to optimum results. Ensures that normal limits of aerodynamic and acoustic performance are achieved.

- Air velocity
- Total pressure differential
- Sound power level

FK-K90-LD with blade bead seal in combinations of width and height up to B x H = 800 mm x 400 mm identified in the table by the blue box

Flow rate in m<sup>3</sup>/h for  $\Delta p_t < 35$  Pa

H in mm	L <sub>WA</sub> in dB(A)	B in mm																			
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	35	650	850	1050	1250	1400	1600	1750	1950	2100	2300	2450	2600	2800	1950	2150	2400	2650	2850	3100	3300
	45	950	1200	1450	1750	2000	2250	2500	2700	2950	3200	3450	3650	3900	2750	3100	3400	3750	4050	4400	4700
250	35	900	1150	1400	1650	1900	2150	2350	2600	2800	3050	3250	3450	3700	2800	3150	3450	3800	4150	4450	4800
	45	1300	1650	2000	2300	2650	3000	3300	3600	3950	4250	4550	4850	5150	4000	4450	4950	5400	5850	6350	6800
300	35	1150	1450	1750	2050	2350	2650	2950	3200	3500	3750	4050	4300	4550	3650	4100	4500	4950	5350	5800	6200
	45	1600	2050	2500	2900	3300	3700	4100	4500	4850	5250	5650	6000	6400	5200	5800	6400	7050	7650	8250	8850
350	35	1400	1750	2100	2450	2800	3150	3500	3800	4150	4450	4800	5100	5400	4500	5050	5550	6050	6600	7100	7650
	45	1950	2450	2950	3450	3950	4400	4850	5350	5800	6250	6700	7150	7550	6400	7150	7900	8650	9400	10100	10850
400	35	1600	2050	2450	2850	3250	3650	4050	4400	4800	5150	5500	5900	6250	5350	5950	6550	7200	7800	8450	9050
	45	2250	2850	3450	4000	4550	5100	5650	6150	6700	7200	7700	8250	8750	7600	8450	9350	10200	11100	12000	12850
450	35	1250	1650	1850	2200	2550	2950	3300	3650	4000	4350	4700	5100	5450	6150	6850	7600	8300	9000	9700	10450
	45	1800	2400	2600	3150	3650	4150	4650	5200	5700	6200	6700	7200	7750	8750	9750	10800	11800	12800	13800	14850
500	35	1550	2100	2100	2500	2900	3300	3700	4150	4550	4950	5350	5750	6150	6950	7800	8600	9400	10200	11000	11800
	45	2200	2950	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

# Technical selection data

## Differential pressure

### Example 1

#### Given

Flow rate: 1250 l/s (4500 m<sup>3</sup>/h)  
 Maximum width: 600 mm  
 Required sound power level: 35 dB(A)

#### Quick selection

FK-K90-LD / 600 × 400 × 500 (with blade bead seal)

### Result of selection

$v_A = 4500 \text{ m}^3/\text{h} / (0.6 \text{ m} \times 0.4 \text{ m} \times 3600) = 5.2 \text{ m/s}$   
 $\Delta p_t = 5 \text{ Pa}$  (from table 1, for B = 450 mm)  
 Correction for B = 600 from table 2  
 $\Delta p_t = 5 \text{ Pa} \times 0.8 \approx 4 \text{ Pa}$   
 $L_{WA} = 31 \text{ dB(A)}$  (from table 3, for B = 450 mm)  
 Correction for B = 600 from table 6  
 $L_{WA} = 31 \text{ dB(A)} + 0.5 \approx 32 \text{ dB(A)}$

Sound power level spectrum								
$f_m$ in Hz	63	125	250	500	1000	2000	4000	8000
$L_{WA}$ in dB(A)	32							
Correction from table 4	13	5	2	-4	-6	-11	-17	-24
$L_W$ in dB	45	37	34	28	26	21	15	8

Table 1: Differential pressure  $\Delta p_t$  in Pa for damper B = 450 mm or 600 mm

H in mm	B in mm	Type	$v_A$ in m/s										
			2	3	4	5	6	7	8	9	10	11	12
200	450	FK-K90-LD with blade bead seal	<	<	6	9	13	18	23	29	36	43	51
250			<	<	5	7	10	14	18	23	29	35	42
300			<	<	<	6	9	12	16	20	25	30	36
350			<	<	<	5	8	11	14	18	22	26	31
400			<	<	<	5	7	10	13	16	20	24	28
450	600	FK-K90 with landing angles with bead seals	<	<	6	9	13	18	23	30	37	44	53
500			<	<	5	8	12	16	21	26	32	39	47
550			<	<	5	7	10	14	19	24	29	35	42
600			<	<	<	7	10	13	17	22	27	32	38
650			<	<	<	6	9	12	16	20	25	30	35
700			<	<	<	6	8	11	15	19	23	28	33
750			<	<	<	5	8	11	14	18	22	26	31
800			<	<	<	5	7	10	13	17	21	25	30

Air velocities  $\geq 8 \text{ m/s}$  are only allowed for fire dampers with spring return actuators.

Table 2: Corrections based on other damper widths B

B in mm	Type	B in mm																				
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500	
450	FK-K90-LD	1.9	1.6	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.7								
600	FK-K90	2.4	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	

# Technical selection data

Sound power level

## Example 2

### Given

Flow rate: 4250 l/s (15300 m<sup>3</sup>/h)  
 Maximum width: 1000 mm  
 Required sound power level: 45 dB(A)

### Quick selection

FK-K90 / 1000 × 700 × 500 (with landing angles with bead seals)

### Result of selection

$v_A = 15300 \text{ m}^3/\text{h} / (1.0 \text{ m} \times 0.7 \text{ m} \times 3600) = 6.1 \text{ m/s}$   
 $\Delta p_t = 8 \text{ Pa}$  (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 6  
 $L_{WA} = 44 \text{ dB(A)} - 1 = 43 \text{ dB(A)}$

Sound power level spectrum								
$f_m$ in Hz	63	125	250	500	1000	2000	4000	8000
$L_{WA}$ in dB(A)	43							
Correction from table 5	4	6	1	-3	-6	-9	-17	-25
$L_W$ in dB	47	49	44	40	37	34	26	18

Table 3: Sound power level  $L_{WA}$  in dB(A) for damper width B = 450 mm or 600 mm

H in mm	B in mm	Type	$v_A$ in m/s										
			2	3	4	5	6	7	8	9	10	11	12
200	450	FK-K90-LD with blade bead seal	<15	20	29	35	41	45	49	53	56	59	62
250			<15	18	27	33	39	44	48	51	54	57	60
300			<15	17	26	32	38	42	46	50	53	56	59
350			<15	17	25	32	37	42	46	49	53	55	58
400			<15	16	25	31	37	42	46	49	52	55	58
450	600	FK-K90 with landing angles with bead seals	<15	26	34	41	46	50	54	57	60	63	65
500			<15	25	34	40	45	50	53	57	60	62	65
550			<15	25	33	40	45	49	53	56	59	62	64
600			<15	25	33	39	44	49	53	56	59	62	64
650			<15	24	33	39	44	48	52	56	59	61	64
700			<15	24	32	39	44	48	52	55	58	61	64
750			<15	24	32	38	44	48	52	55	58	61	63
800			<15	24	32	38	43	48	52	55	58	61	63

Air velocities  $\geq 8 \text{ m/s}$  are only allowed for fire dampers with spring return actuators.

Table 4: Correction values for FK-K90-LD with blade bead seal to obtain octave levels in dB/Oct.

$v_A$ in m/s	$f_m$ in Hz							
	63	125	250	500	1000	2000	4000	8000
2	17	8	3	-2	-8	-17	-26	-33
4	15	5	2	-3	-7	-12	-19	-26
6	10	4	2	-4	-6	-10	-16	-22
8	7	3	1	-4	-6	-8	-13	-19
10	5	2	1	-5	-5	-6	-11	-17

Table 5: Correction values for FK-K90 with landing angles with bead seals to obtain octave levels in dB/Oct.

$v_A$ in m/s	$f_m$ in 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

# Technical selection data

Free cross sectional area, resistance coefficient and correction values

Table 6: Free cross sectional area, resistance coefficient and correction values

H in mm		B in mm																			
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	A in m <sup>2</sup>	0.020	0.027	0.034	0.041	0.048	0.055	0.062	0.069	0.076	0.083	0.090	0.097	0.104	0.084	0.094	0.104	0.114	0.124	0.134	0.144
	ζ	1.12	0.94	0.77	0.71	0.65	0.59	0.53	0.53	0.47	0.47	0.41	0.41	0.41	2,18	2,18	2,18	2,18	2,18	1,90	1,90
	K	1	1	0	0	0	0	0	0	0.5	0.5	1	1	1	-1	-1	-1	-1	-1	-1	-1
250	A in m <sup>2</sup>	0.029	0.039	0.048	0.058	0.067	0.077	0.086	0.096	0.105	0.115	0.124	0.134	0.143	0.126	0.141	0.156	0.171	0.186	0.201	0.216
	ζ	0.91	0.77	0.62	0.58	0.53	0.48	0.43	0.43	0.38	0.38	0.34	0.34	0.34	1,26	1,26	1,26	1,26	1,26	1,11	1,11
	K	1	1	0	0	0	0	0	0	0.5	0.5	1	1	1	-1	-1	-1	-1	-1	-1	-1
300	A in m <sup>2</sup>	0.038	0.050	0.062	0.074	0.086	0.098	0.11	0.122	0.134	0.146	0.158	0.17	0.182	0.168	0.188	0.208	0.228	0.248	0.268	0.288
	ζ	0.78	0.66	0.53	0.49	0.45	0.41	0.37	0.37	0.33	0.33	0.29	0.29	0.29	0,89	0,89	0,89	0,89	0,89	0,78	0,78
	K	1	1	0	0	0	0	0	0	0.5	0.5	1	1	1	-1	-1	-1	-1	-1	-1	-1
350	A in m <sup>2</sup>	0.047	0.062	0.076	0.091	0.105	0.12	0.134	0.149	0.163	0.178	0.192	0.207	0.221	0.21	0.235	0.26	0.285	0.31	0.335	0.36
	ζ	0.68	0.58	0.47	0.43	0.40	0.36	0.32	0.32	0.29	0.29	0.25	0.25	0.25	0,69	0,69	0,69	0,69	0,69	0,60	0,60
	K	1	1	0	0	0	0	0	0	0.5	0.5	1	1	1	-1	-1	-1	-1	-1	-1	-1
400	A in m <sup>2</sup>	0.056	0.073	0.090	0.107	0.124	0.141	0.158	0.175	0.192	0.209	0.226	0.243	0.26	0.252	0.282	0.312	0.342	0.372	0.402	0.432
	ζ	0.63	0.53	0.43	0.40	0.36	0.33	0.30	0.30	0.26	0.26	0.23	0.23	0.23	0,57	0,57	0,57	0,57	0,57	0,50	0,50
	K	1	1	0	0	0	0	0	0	0.5	0.5	1	1	1	-1	-1	-1	-1	-1	-1	-1
450	A in m <sup>2</sup>	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	1.48	1.13	0.98	0.85	0.79	0.73	0.67	0.61	0.61	0.61	0.55	0.55	0.55	0,49	0,49	0,49	0,49	0,49	0,43	0,43
	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 in m <sup>2</sup>	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	1.35	1.03	0.86	0.76	0.70	0.65	0.59	0.54	0.54	0.54	0.49	0.49	0.49	0,43	0,43	0,43	0,43	0,43	0,38	0,38
	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 in m <sup>2</sup>			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			0.78	0.69	0.64	0.59	0.54	0.49	0.49	0.49	0.44	0.44	0.44	0,39	0,39	0,39	0,39	0,39	0,34	0,34
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
600	A in m <sup>2</sup>			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			0.70	0.62	0.57	0.53	0.48	0.44	0.44	0.44	0.40	0.40	0.40	0,35	0,35	0,35	0,35	0,35	0,31	0,31
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
650	A in m <sup>2</sup>			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			0.66	0.57	0.53	0.49	0.45	0.41	0.41	0.41	0.37	0.37	0.37	0,33	0,33	0,33	0,33	0,33	0,29	0,29
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
700	A in m <sup>2</sup>			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			0.61	0.53	0.49	0.46	0.42	0.38	0.38	0.38	0.34	0.34	0.34	0,31	0,31	0,31	0,31	0,31	0,27	0,27
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
750	A in m <sup>2</sup>			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			0.58	0.50	0.47	0.43	0.40	0.36	0.36	0.36	0.32	0.32	0.32	0,29	0,29	0,29	0,29	0,29	0,25	0,25
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1
800	A in m <sup>2</sup>			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			0.54	0.48	0.44	0.41	0.37	0.34	0.34	0.34	0.31	0.31	0.31	0,27	0,27	0,27	0,27	0,27	0,24	0,24
	K			2	2	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1

# Installation details

In solid walls and ceiling slabs and also gypsum wallboards

## Mortar based installation

Installation of the fire damper is approved in solid walls and ceiling slabs and also in gypsum wallboards with perimeter mortar in fill (wet installation). Installation in horizontal or vertical ducts. Air flow direction is not critical.

### Requirements

- Solid walls of concrete, aerated concrete or made of brickwork or gypsum wallboards with minimum thickness 100 mm
- Solid ceiling slabs of concrete or aerated concrete with minimum thickness 125 mm
- 75 mm minimum distance to load bearing structural elements
- 200 mm minimum distance between two fire dampers when installed in ceiling slabs
- Connection of rigid ducts using a flexible connector when installed in gypsum wallboards to DIN 18163

### Recommendations

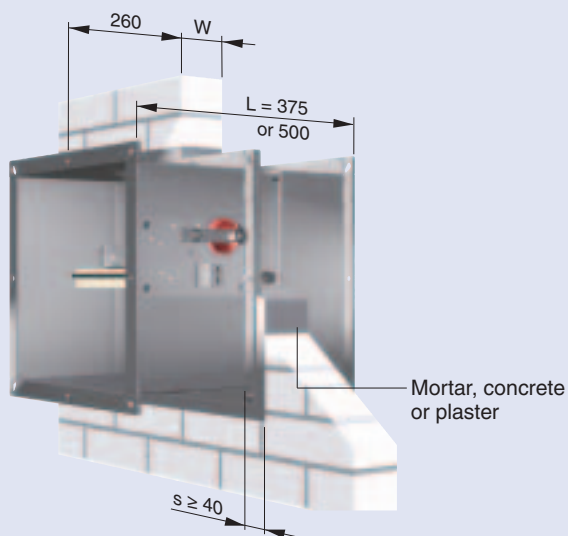
- Casing length  $L = 500$  mm, if the wall is thicker than 100 mm or the ceiling slab is thicker than 125 mm

### Installation details

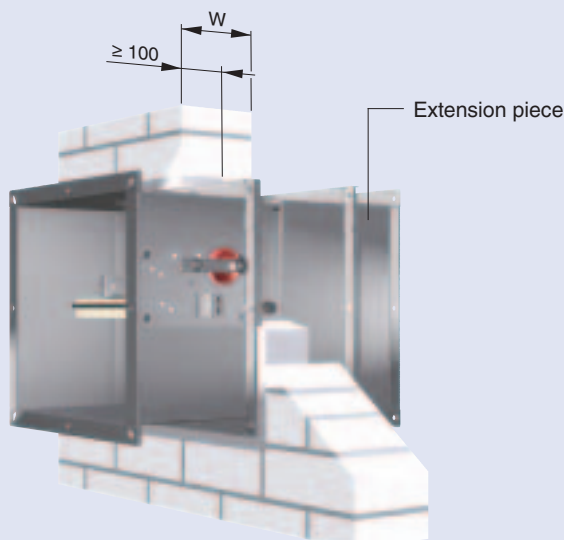
- An opening or a cut hole with a minimum  $B + 80$  mm and  $H + 80$  mm is required or the fire damper is concreted into the wall or ceiling slab during construction
- Perimeter gap »s« is completely sealed with mortar. The mortar bed depth must not be less than 100 mm. Mortar that conforms to DIN 1053, Groups II, IIa, III or IIIa, concrete or plaster are approved for use.

## Wall installation

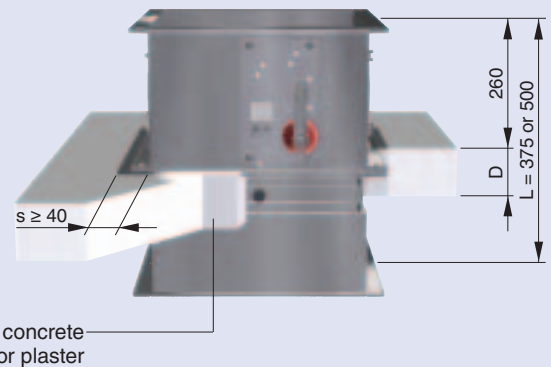
$W \leq 240$  mm



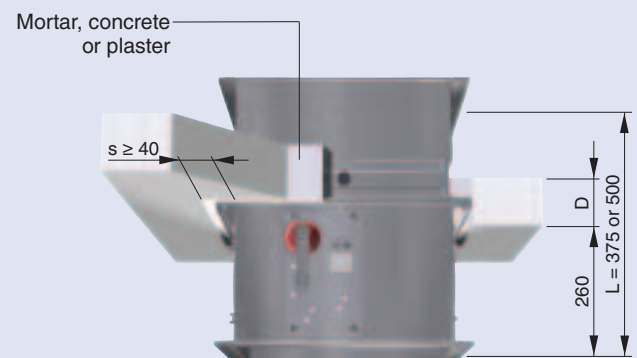
$W > 240$  mm



## Ceiling slab installation, upright



## Ceiling slab installation, suspended



# Installation details

## In solid walls with difficult access

Installation of the fire damper is approved in solid walls with perimeter mortar in fill (wet installation) or without mortar (dry installation).

- Mortar based installation with partial mortaring
- Mortar based installation of multiple dampers flange to flange
- Dry mortarless installation with installation subframe and installation kit

Installation in horizontal ducts. Air flow direction is not critical.

## Mortar based installation with partial mortaring

### Requirements

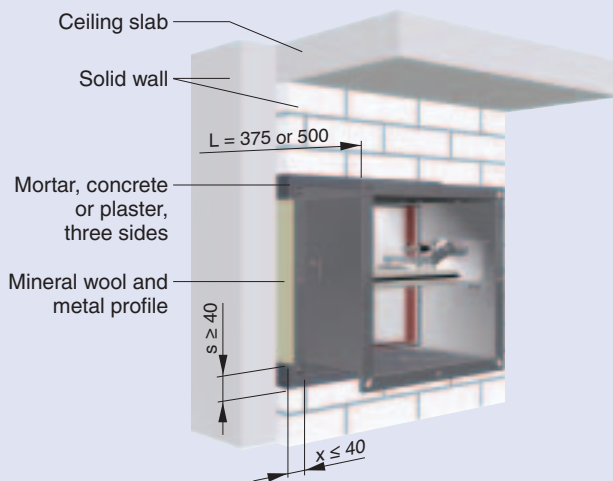
- Solid walls of concrete, aerated concrete or made of brickwork with minimum thickness 100 mm
- Connection of rigid ducts using flexible connectors

### Installation details

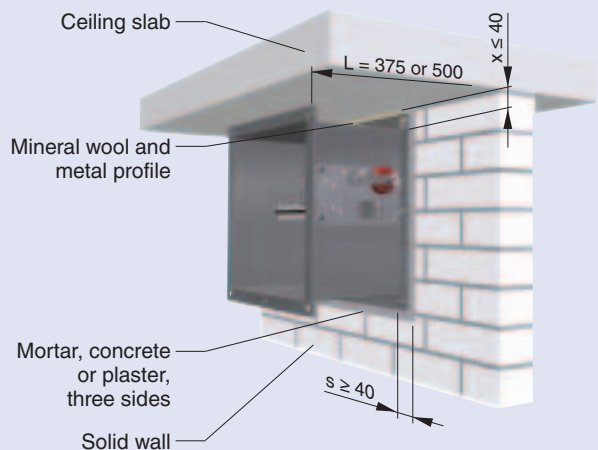
- Difficult to access gaps are sealed with metal profiles and mineral wool
- Gaps »x« are completely sealed with mineral wool, to DIN 4102, fire rating class A1, non-combustible, gross density approx. 100 kg/m<sup>3</sup>
- Gaps »s« are completely sealed with mortar. The mortar bed depth must not be less than 100 mm. Mortar that conforms to DIN 1053, Groups II, IIa, III or IIIa, concrete or plaster are approved for use.

### Installation with partial mortaring

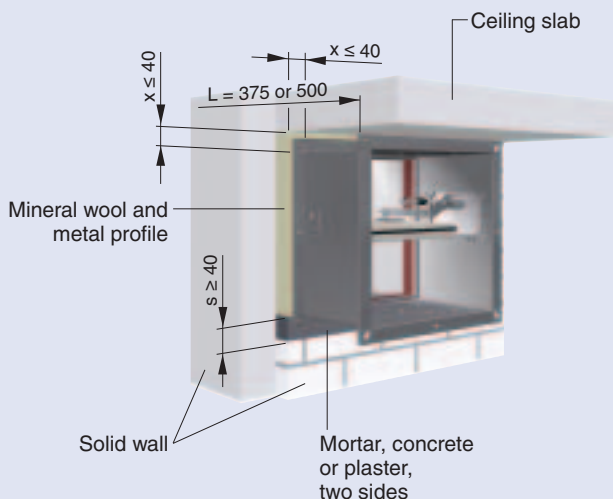
Difficult to access gap on one side,  
Wall joint



Difficult to access gap on one side,  
Ceiling joint



Difficult to access gap on two sides,  
Wall and ceiling joint



### Mortar based installation of multiple dampers flange to flange

#### Requirements

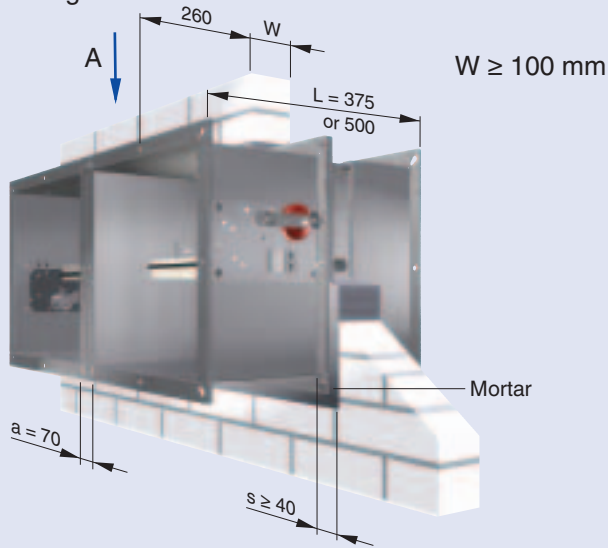
- Solid walls of concrete, aerated concrete or made of brickwork with minimum thickness 100 mm

#### Installation details

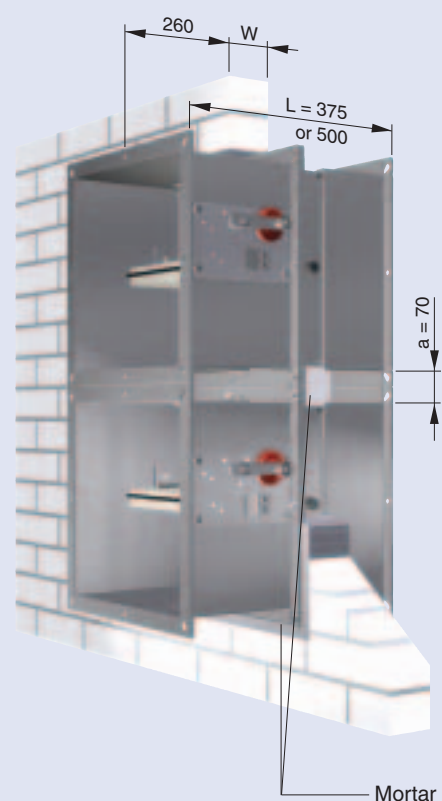
- An opening or a cut hole with a minimum  $2 \times B + 150$  mm and  $H + 80$  mm or  $B + 80$  mm and  $2 \times H + 150$  mm is required or the fire damper is concreted into the wall slab during construction
- The flanges of the horizontal or vertical arranged fire dampers are next to one another, the spacing between the casings is »a« = 70 mm
- Gaps »s« and »a« are completely sealed with mortar. The mortar bed depth must not be less than 100 mm. Mortar that conforms to DIN 1053, Groups II, IIa, III or IIIa, concrete or plaster are approved for use.

### Flange to flange

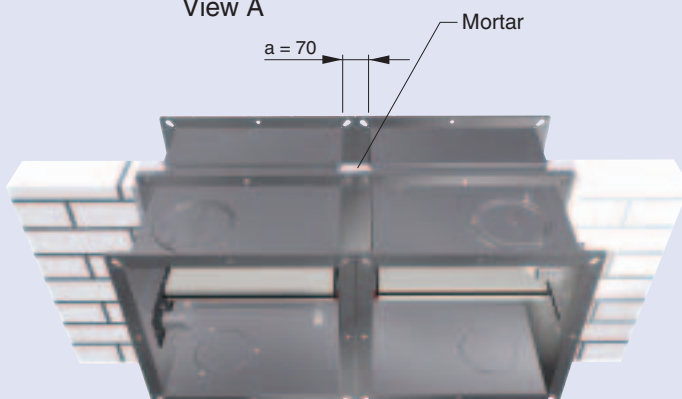
#### Arrangement horizontal



#### Arrangement vertical



#### View A



# Installation details

## In solid walls

### Dry mortarless installation with installation subframe and installation kit

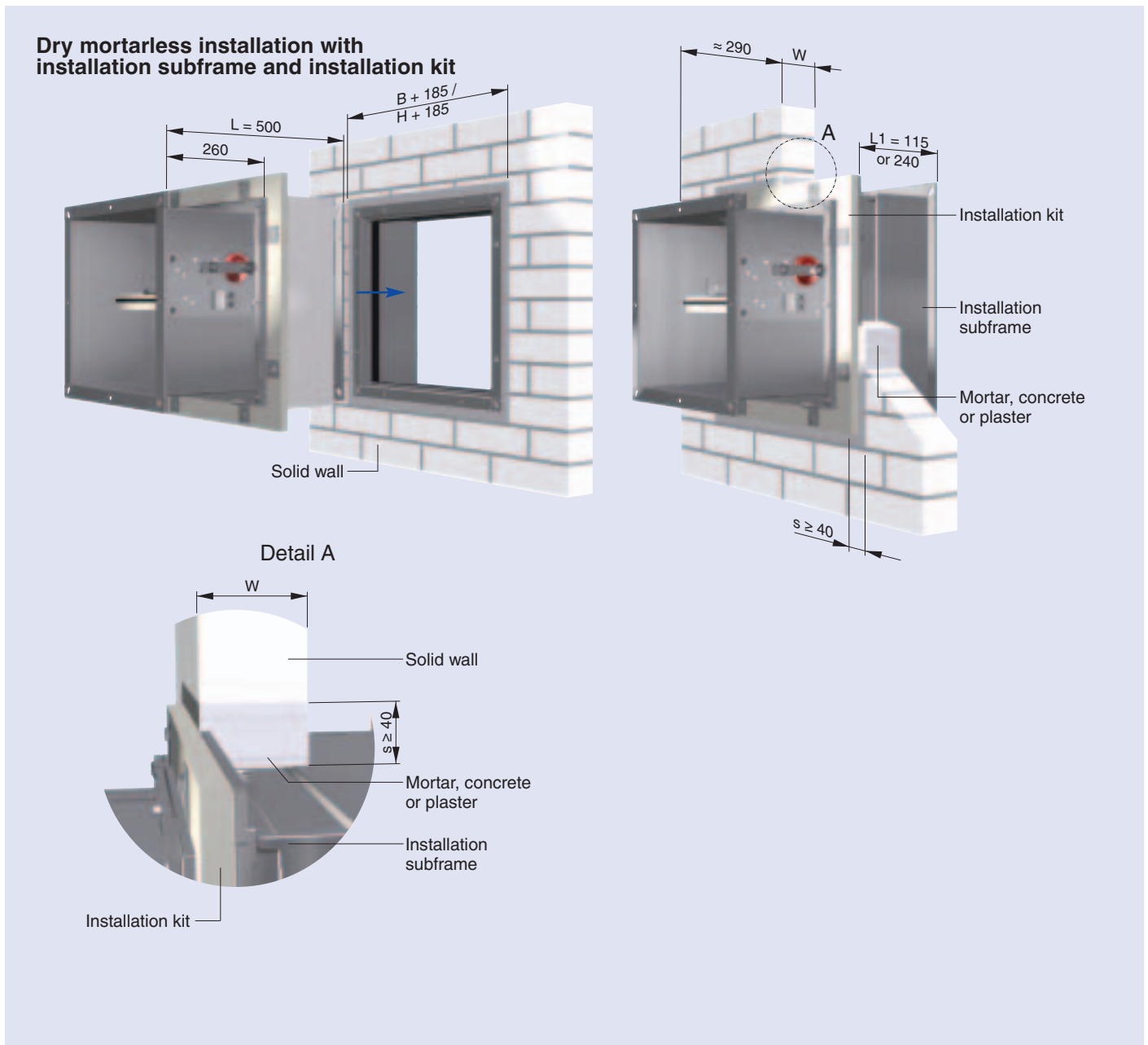
#### Requirements

- Solid walls of concrete, aerated concrete or made of brickwork with minimum thickness 100 mm
- Casing length  $L = 500$  mm

#### Installation details

- An opening or cut hole with a minimum  $B + 185$  mm and  $H + 185$  mm is required
- Fire damper is fitted with the installation kit and pushed into the installation subframe
- Perimeter gap »s« is completely sealed with mortar. The mortar bed depth must not be less than 100 mm. Mortar that conforms to DIN 1053, Groups II, IIa, III or IIIa, concrete or plaster are approved for use.

Further information about installation subframe and installation kit see page 8.



# Installation details

Directly on the face of solid walls and ceiling slabs

## Dry mortarless installation

Installation of the fire damper is approved directly on the face of solid walls and ceiling slabs with a face frame and panel cladding.

Installation in horizontal and vertical ducts. Air flow direction is not critical.

### Requirements

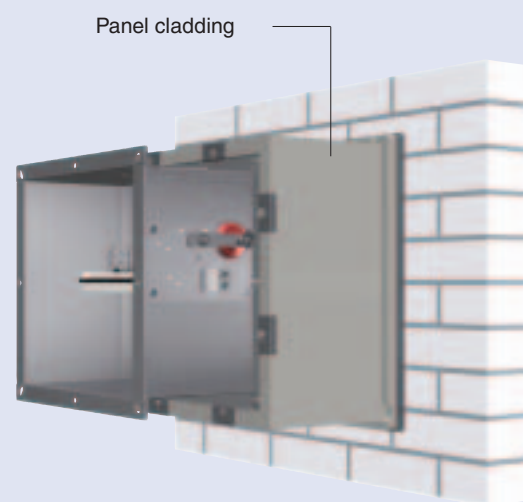
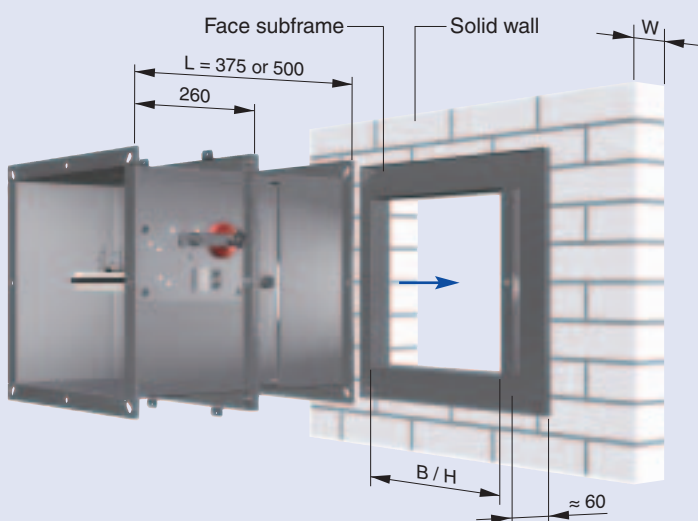
- Solid walls of concrete, aerated concrete or made of brickwork with minimum thickness 100 mm
- Solid ceiling slabs of concrete or aerated concrete with minimum thickness 125 mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using a flexible connector

### Installation details

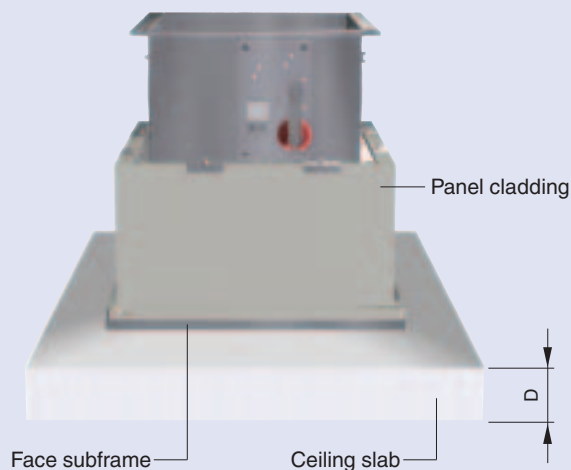
- Perimeter fire resistant insulation with panel cladding is required (Accessory or by others)
- Unevenness of the hole in the wall or ceiling slab is scimmed to form a smooth surface to enable effective sealing of the subframe. Face subframe is fixed only with suitable plugs and screws.

Further information about face subframe with panel cladding see page 9.

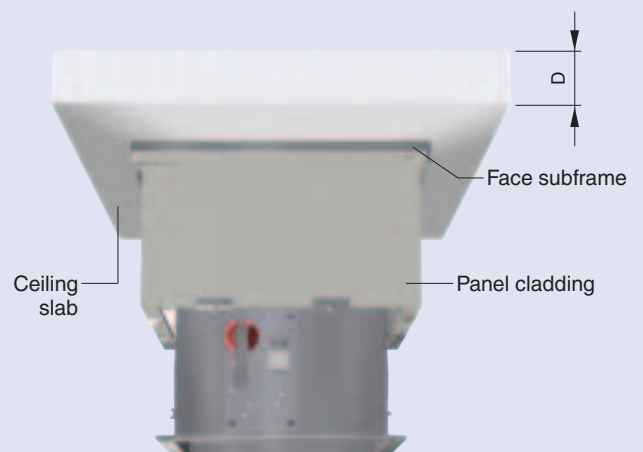
### Installation to wall



### Upright ceiling installation



### Suspended ceiling installation



# Installation details

## Adjacent to solid walls and ceiling slabs

### Dry mortarless installation

Installation of the fire damper is approved directly adjacent to solid walls and ceiling slabs when connecting to an existing fire damper that requires refurbishment, to sheet steel duct with angled profile and perimeter mortaring or to an intermediate frame and/or angle frame with perimeter mortaring. In all cases additional suspension support of the new fire damper is not required.

Installation in horizontal or vertical ducts. Air flow direction is not critical.

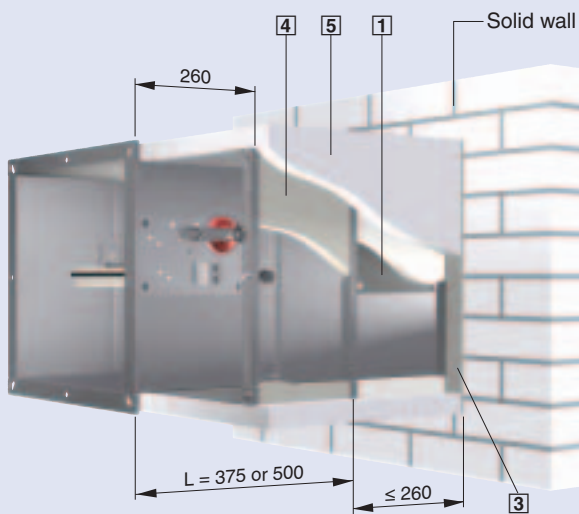
#### Requirements

- Maximum 260 mm duct with approved fire resistance without any opening between the fire damper and the wall
- Solid walls of concrete, aerated concrete or made of brickwork with minimum thickness 100 mm
- Solid ceiling slabs of concrete or aerated concrete with minimum thickness 125 mm
- Connection of rigid ducts using a flexible connector

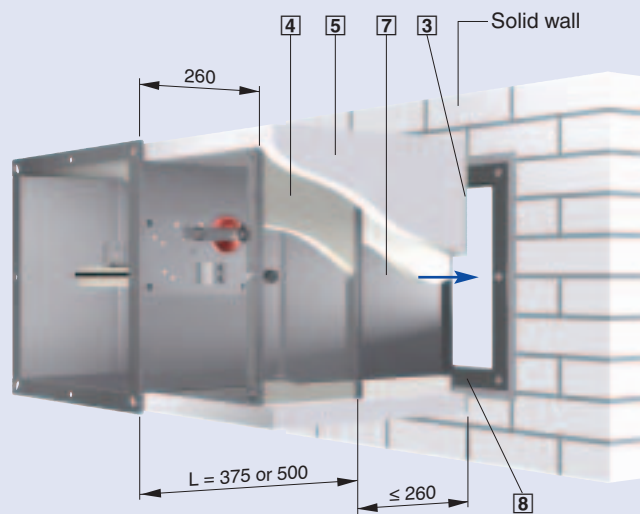
### Installation details

- Existing fire damper, duct or intermediate frame is clad with 40 mm mineral wool or calcium silicate and then additional L90 cladding
- Panel cladding ends 10 mm from the wall, ceiling or angle profile, the gap is filled with mineral wool
- Mineral wool, to DIN 4102, fire rating class A1, non-combustible, gross density approx. 100 kg/m<sup>3</sup>

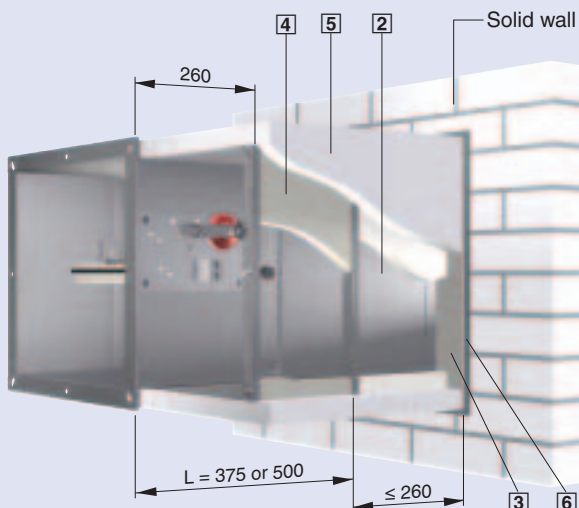
### Installation adjacent to wall with existing fire damper casing



### Installation adjacent to wall to duct with intermediate frame and/or angle frame



### Installation adjacent to wall to duct with angle profile



- 1 Existing fire damper casing
- 2 Existing duct
- 3 Mineral wool
- 4 Mineral wool or calcium silicate
- 5 Cladding L90
- 6 Angle profile
- 7 Intermediate frame
- 8 Angle frame

- Installation remote from a solid wall suspension supports are required.
- To support heavy loads a fixing plate can be used.

### Steel plug anchors

- Plug anchors with general building inspectorate licence (ABZ) or European technical approval (ETA) with certified fire protection qualification:  
Plugs are installed and must have loads that do not exceed those in the approval certificate.
- Plug anchors with general building inspectorate licence (ABZ) or European technical approval (ETA) without certified fire protection qualification:  
Plug in minimum M8 is installed to a depth twice as required in the approval-certificate, however the depth must be at least 60 mm, and loaded with a maximum of 50 kg.
- If the maximum load is exceeded a fixing plate is required

### Threaded rod

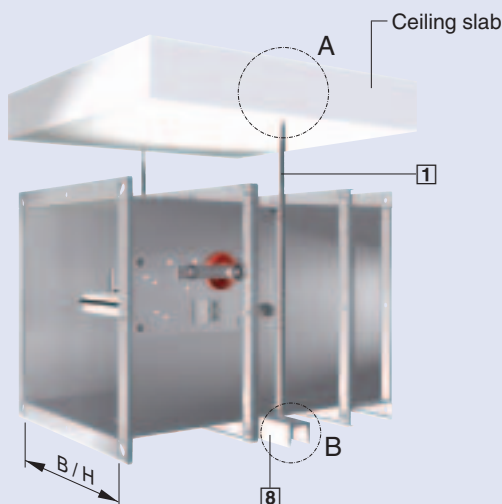
- Threaded rods > 1.5 m need fire resistant cladding

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

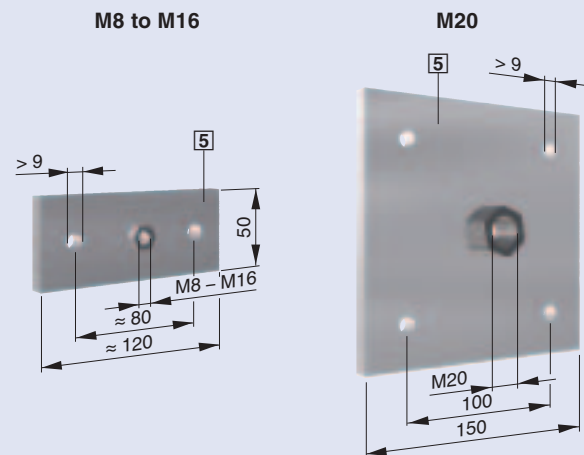
\* Weight of the fire damper, see page 7

- 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 Fixing plate, min. 10 mm thick, galvanised or coated steel
- 6 Steel plug anchor, galvanised steel
- 7 Threaded bush, galvanised steel
- 8 Cross member, U50 to DIN 1026, 50 mm × 38 mm × 5 mm, galvanised or coated steel

### Suspension



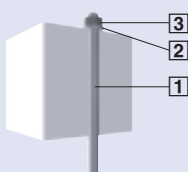
### Fixing plate



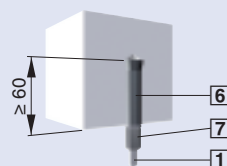
### Detail A

#### Ceiling slab fixing

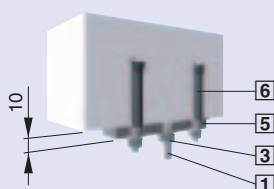
##### without plug



##### with plug



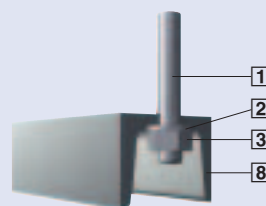
##### with plug anchor and fixing plate



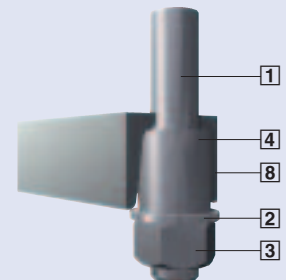
### Detail B

#### Cross member

##### M8 to M14



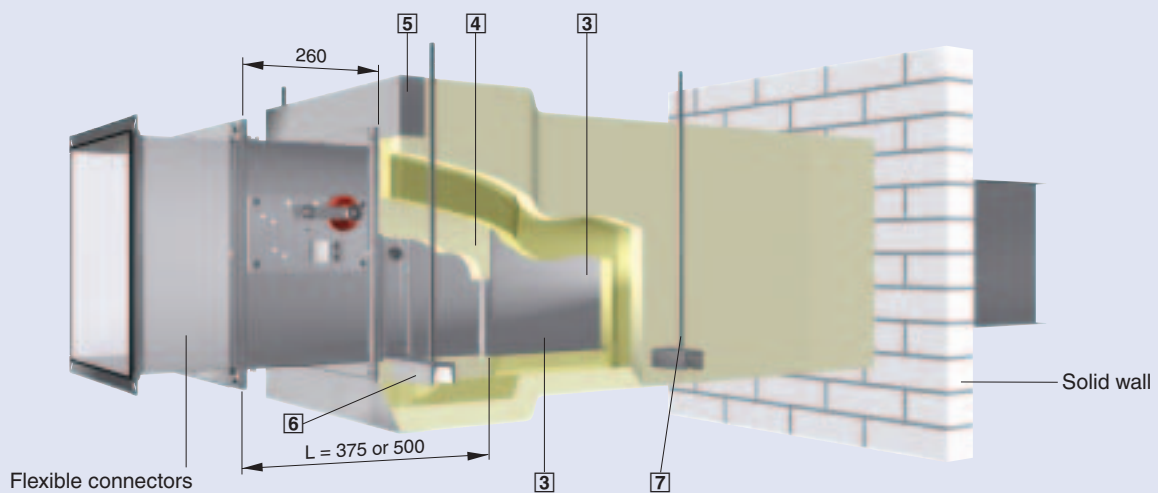
##### M16 to M20





- 1 Sheet steel ventilation ducting with fire resistant cladding L90
- 2 Ducting made of L90 boards
- 3 Sheet steel ventilation ducting with outer mineral wool insulation L90 to DIN 4102-4 (Edition March 1994)
- 4 Mineral wool, to DIN 4102, fire rating class A1, non-combustible, gross density approx.  $100 \text{ kg/m}^3$ , thickness approx. 40 mm
- 5 Cover plate, by others (only required with outer mineral wool insulation)
- 6 Cross member U50 to DIN 1026, 50 mm  $\times$  38 mm  $\times$  5 mm, galvanised or coated steel; Suspension can be outside of the cladding (but inside of mineral wool insulation)
- 7 Suspension according to the particulars of the ducting manufacturer; however the maximum distance between two suspension assemblies should not exceed 1m
- 8 Board staples or dry wall screws, steel

## In sheet steel ventilation ducting with outer mineral wool insulation L90



# Installation details

In lightweight partition walls with metal support structure and clad on both sides

Installation of fire dampers in lightweight partition walls with metal support structure and clad both sides is approved with perimeter mortar in fill (wet installation) or without mortar (dry installation).

- Mortar based installation
- Dry mortarless installation with installation kit
- Dry mortarless installation during construction of the wall
- Dry mortarless installation with installation kit for flexible ceiling joint

Installation in horizontal ducts. Air flow direction is not critical.

## Mortar based installation

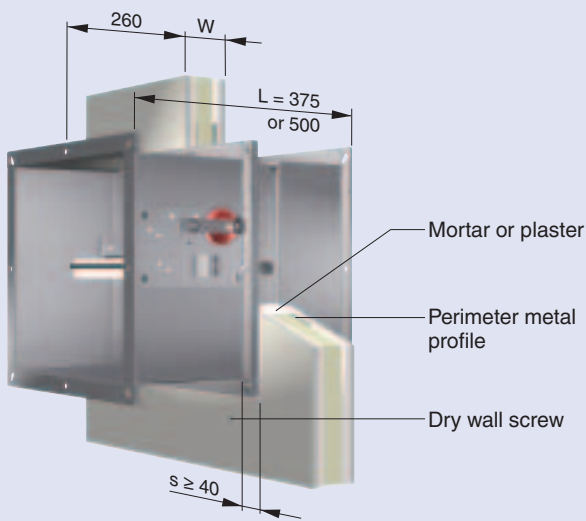
### Requirements

- Lightweight partition walls with metal support structure and mineral wool, minimum thickness 100 mm, to DIN 4102-4, Table 48 or with general appraisal certificate
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

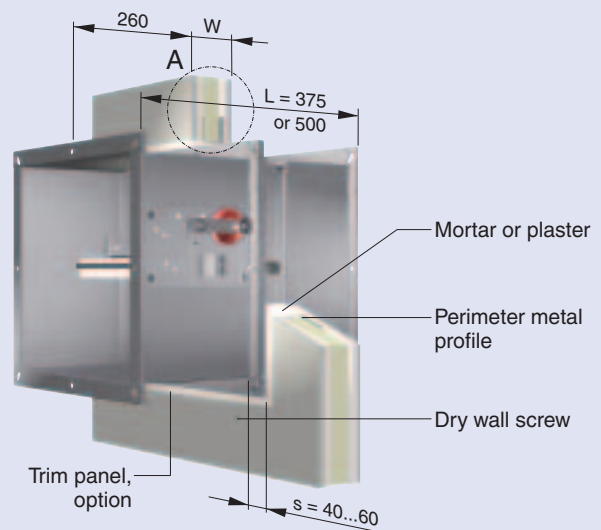
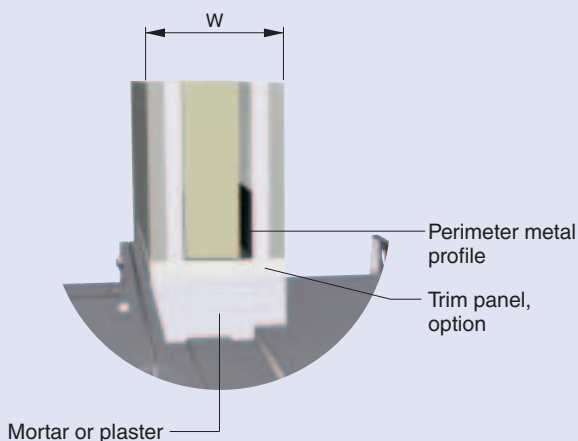
### Installation details

- An opening or cut hole with  $B + 80 \dots 120$  mm and  $H + 80 \dots 120$  mm is required
- Perimeter gap »s« is completely sealed with mortar. The mortar bed depth must not be less than 100 mm. Mortar that conforms to DIN 1053, Groups II, IIa, III or IIIa, or preferably plaster are approved for use.
- Optional plaster board trim panels

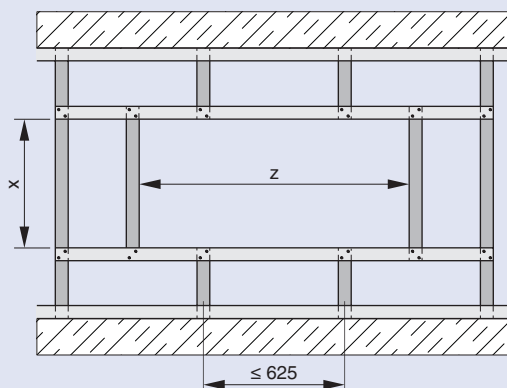
## Mortar based installation



Detail A



## Metal support structure for mortar based installation



$$x = H + 80 \dots 120 \text{ mm}$$

$$z = B + 80 \dots 120 \text{ mm}$$

# Installation details

In lightweight partition walls with metal support structure and clad on both sides

## Dry mortarless installation with installation kit

### Requirements

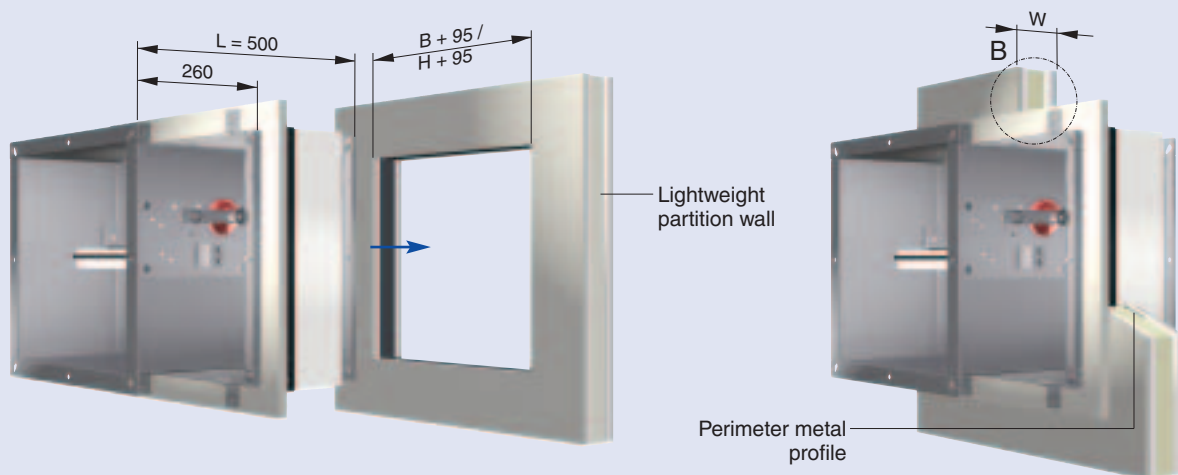
- Lightweight partition walls with metal support structure and mineral wool, minimum thickness 100 mm, to DIN 4102-4, Table 48 or with general appraisal certificate
- Casing length  $L = 500$  mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

### Installation details

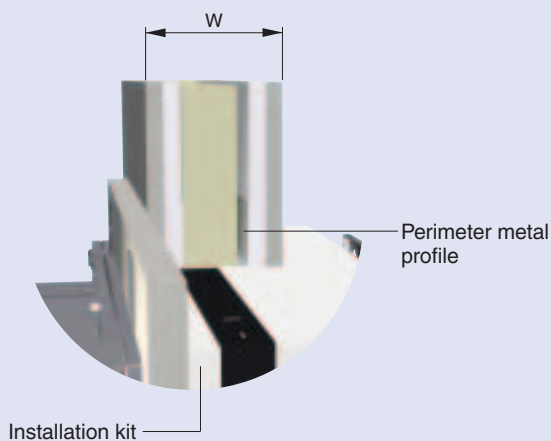
- An opening with a minimum  $B + 95$  mm and  $H + 95$  mm is required
- Fire damper is assembled with the installation kit and pushed into the ready made lightweight partition wall. Fixing is carried out with clamps and screws to the perimeter metal profile.

Further information about installation kit see page 10.

## Dry mortarless installation with installation kit

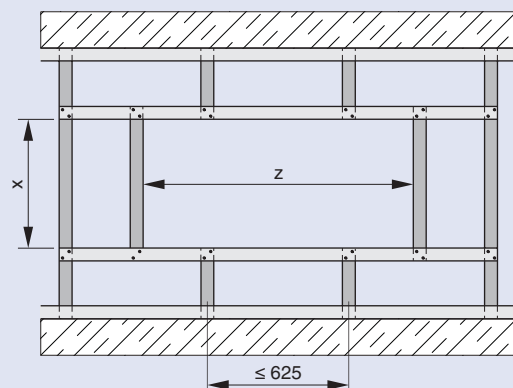


### Detail B



### Metal support structure

for dry mortarless installation with installation kit



$$x = H + 95 \text{ mm}$$

$$z = B + 95 \text{ mm}$$

# Installation details

In lightweight partition walls with metal support structure and clad on both sides

## Dry mortarless installation during construction of the wall

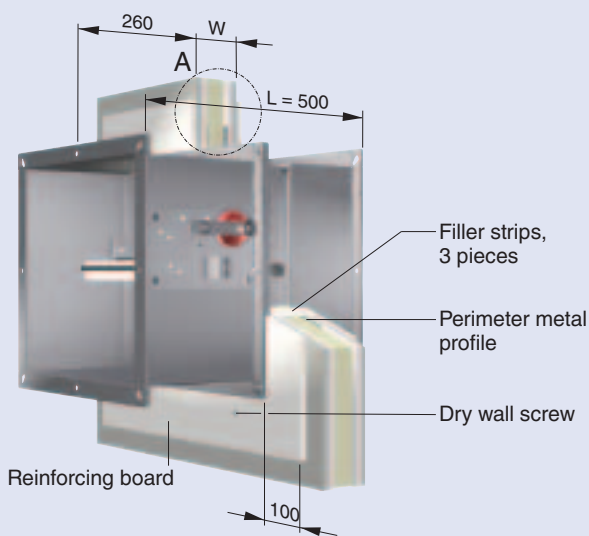
### Requirements

- Lightweight partition walls with metal support structure and mineral wool, minimum thickness 100 mm, to DIN 4102-4, Table 48 or with general appraisal certificate
- Casing length  $L = 500$  mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

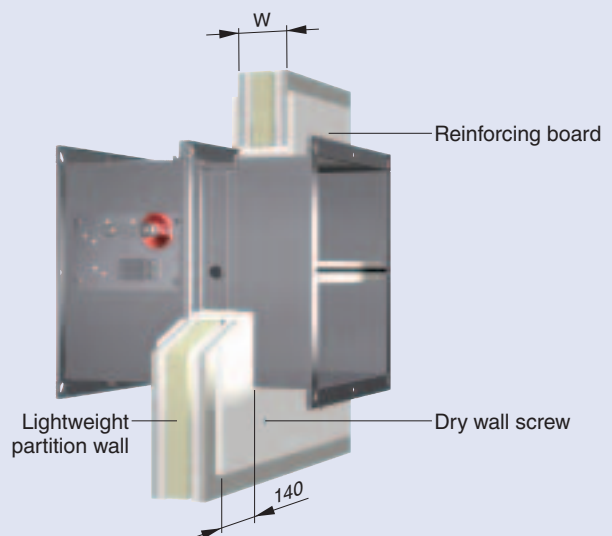
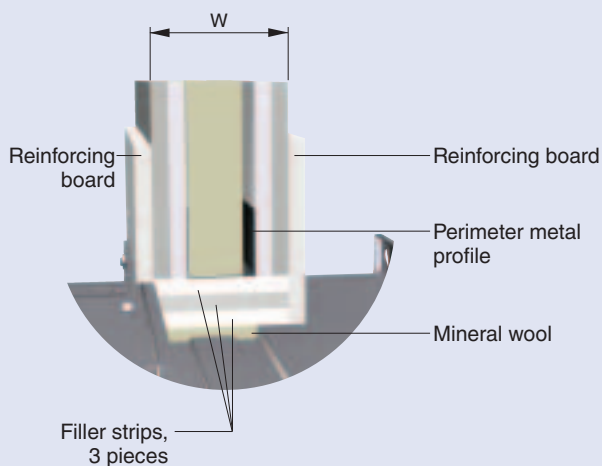
### Installation details

- A perimeter metal profile frame with a minimum  $B + 75$  mm and  $H + 75$  mm is required
- Fire damper is assembled with perimeter plaster-board strips by others. For fixing reinforcing boards are used on both sides of the partition wall.

## Dry mortarless installation during construction of the wall

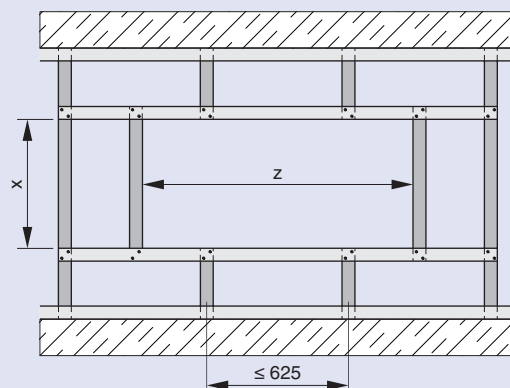


Detail A



## Metal support structure

for dry mortarless installation during construction of the wall



$$x = H + \text{minimum } 75 \text{ mm}$$

$$z = B + \text{minimum } 75 \text{ mm}$$

# Installation details

In lightweight partition walls with metal support structure and clad on both sides

## Flexible ceiling joint with installation kit

### Requirements

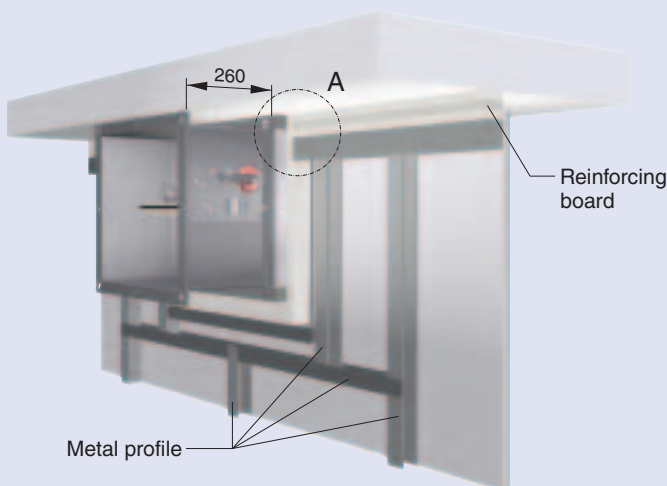
- Lightweight partition walls with metal support structure and mineral wool, thickness 100 mm, to DIN 4102-4, Table 48 or with general appraisal certificate
- Maximum subsidence of the ceiling slab »a« = 40 mm
- Casing length L = 500 mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

### Installation details

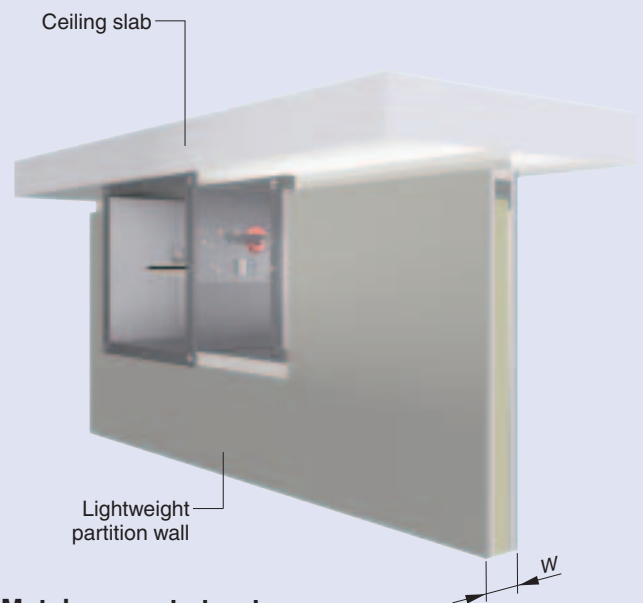
- Fire damper is fixed to the wall using the factory installed installation kit
- Cladding of the lightweight partition wall can only be carried out after installation of the fire damper
- A three-side metal profile frame with  $B + 305$  mm and  $H + a + 186$  mm is required

Further information about installation kit see page 11.

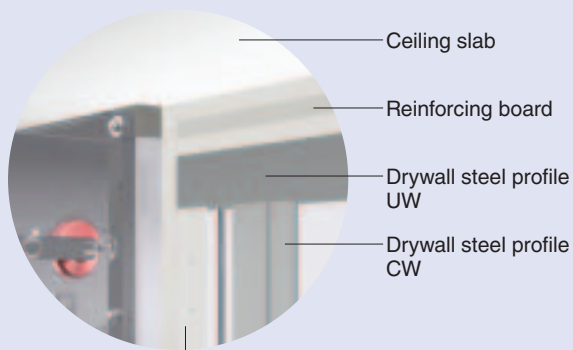
## Flexible ceiling joint with installation kit



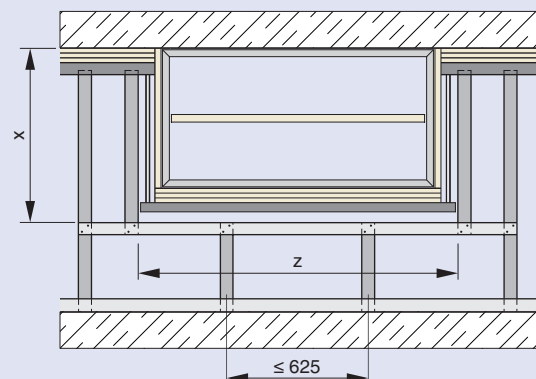
Detail A



Metal support structure for flexible ceiling joint



Installation kit



$$x = H + a + 186 \text{ mm}$$

$$z = B + 305 \text{ mm}$$

# Installation details

In lightweight partition walls with metal support structure and clad on one side

## Dry mortarless installation with installation kit

Installation of fire dampers in lightweight partition walls with metal support structure and clad on one side is approved without mortar (dry installation).

Dry mortarless installation in an existing lightweight partition wall is carried out using an installation kit.

Installation in horizontal ducts. Air flow direction is not critical.

### Requirements

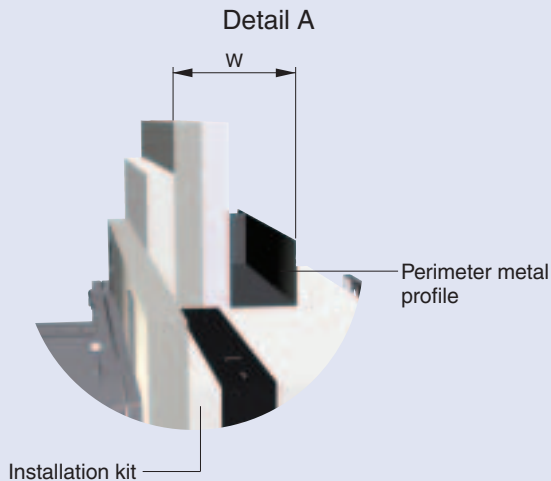
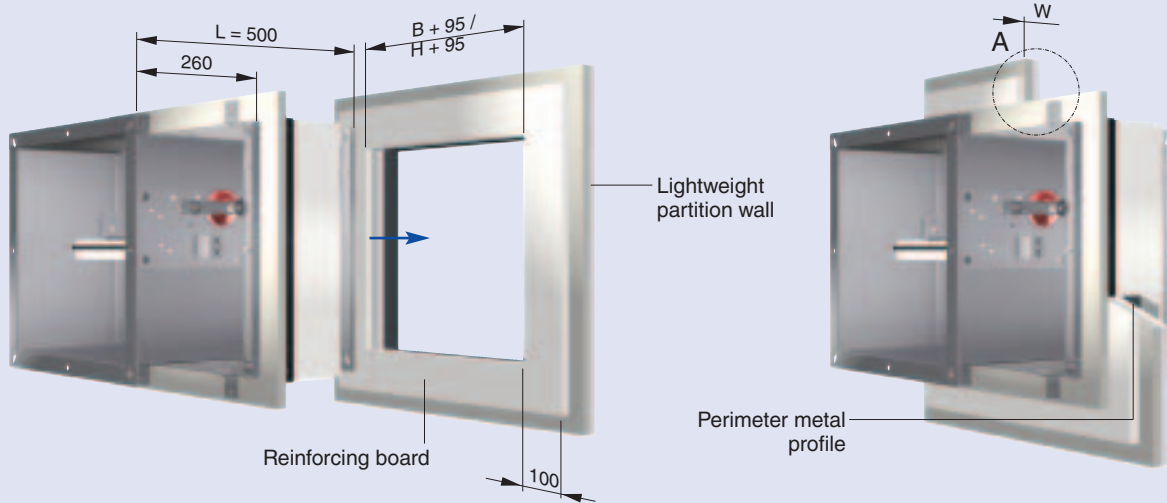
- Lightweight partition walls with metal support structure with minimum thickness 90 mm
- Wall height maximum 5000 mm
- Casing length  $L = 500$  mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors
- Further conditions according to general appraisal certificate P-3254/1449

### Installation details

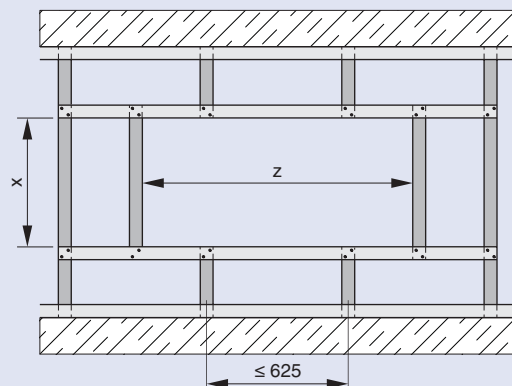
- An opening with a minimum  $B + 95$  mm and  $H + 95$  mm is required

Further information about installation kit see page 10.

## Dry mortarless installation with installation kit



## Metal support structure for dry mortarless installation with installation kit



$$x = H + 95 \text{ mm}$$

$$z = B + 95 \text{ mm}$$

# Installation details

In lightweight partition walls without metal support structure and clad on one side

## Dry mortarless installation with installation kit

Installation of fire dampers in lightweight partition walls without metal support structure and clad on one side is approved without mortar (dry installation).  
 Dry mortarless installation in an existing lightweight partition wall is carried out using an installation kit.  
 Installation in horizontal ducts. Air flow direction is not critical.

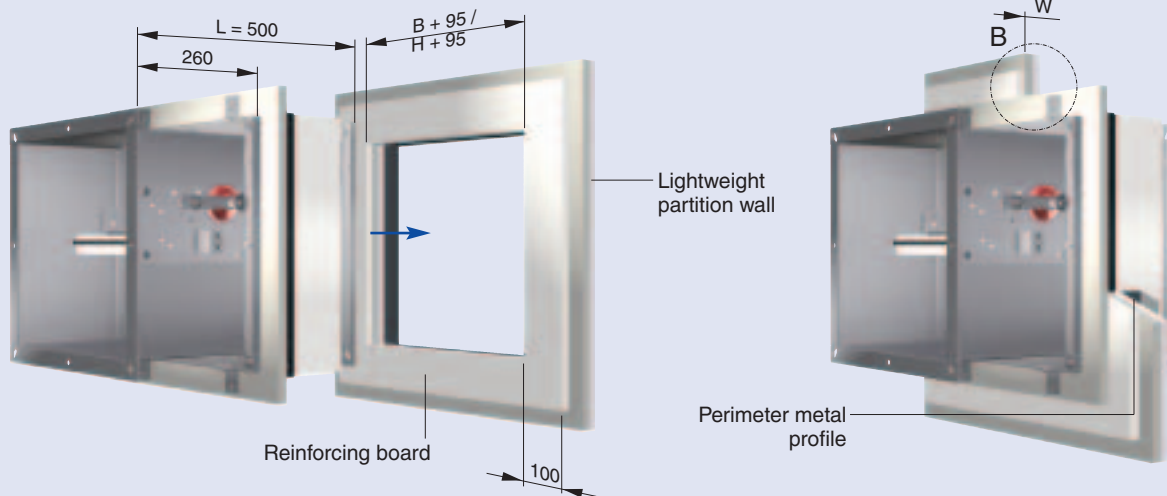
### Requirements

- Lightweight partition walls without metal support structure with minimum thickness 40 mm
- Wall width maximum 2000 mm
- Wall height maximum 5000 mm
- Casing length  $L = 500$  mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors
- Further conditions according to general appraisal certificate P-3160/0967 or P-3586/8692

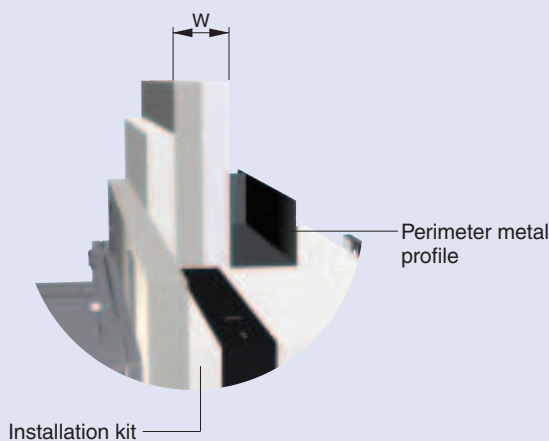
### Installation details

- An opening with a minimum  $B + 95$  mm and  $H + 95$  mm is required
- Further information about installation kit see page 10.

## Dry mortarless installation with installation kit

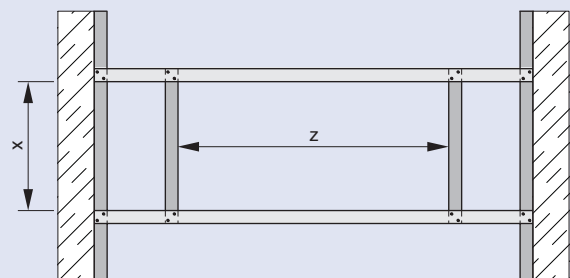


Detail B



## Metal support structure

for dry mortarless installation with installation kit



$x = H + 95$  mm  
 $z = B + 95$  mm

# Installation details

In lightweight fire walls with metal support structure and clad on both sides

Installation of fire dampers in lightweight fire walls with metal support structure and clad on both sides is approved with perimeter mortar in fill (wet installation) or without mortar (dry installation).

- Mortar based installation
- Dry mortarless installation with installation kit

Installation in horizontal ducts. Air flow direction is not critical.

## Mortar based installation

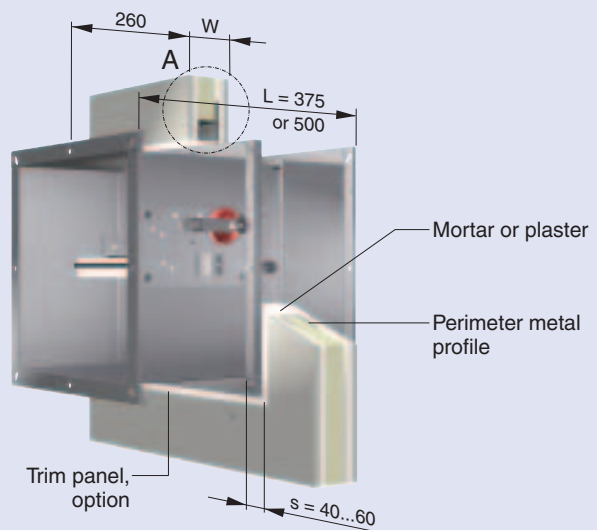
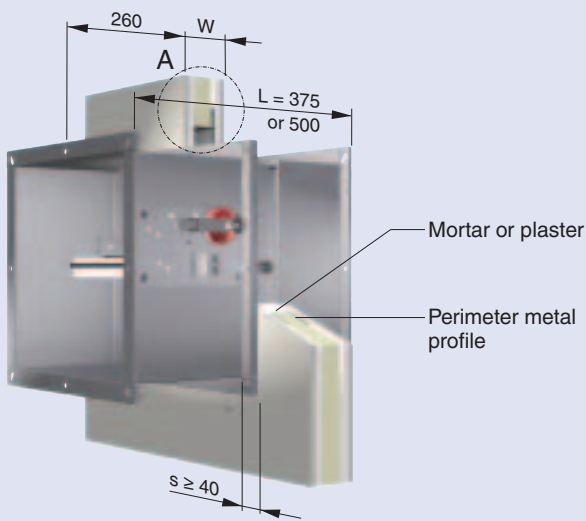
### Requirements

- Lightweight fire walls with metal support structure according to general appraisal certificate and minimum thickness 110 mm  
Knauf ABP P-3391/170/08, Rigips ABP P-3020/0109  
Lafarge ABP P-3391/0890, Promat ABP P-3796/7968
- Wall height maximum 5000 mm
- 200 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

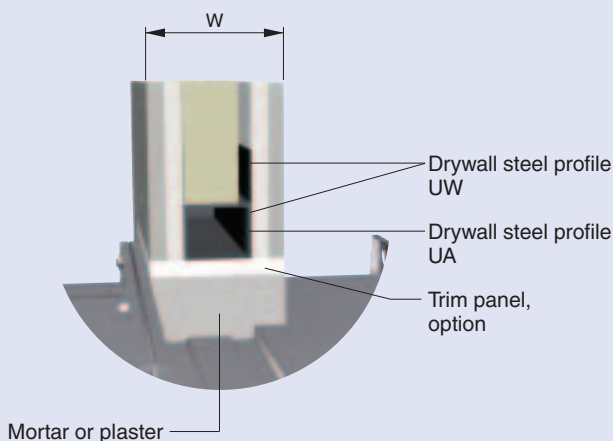
### Installation details

- An opening or cut hole with  $B + 80 \dots 120$  mm and  $H + 80 \dots 120$  mm is required
- Perimeter gap »s« is completely sealed with mortar. The mortar bed depth must not be less than 100 mm. Mortar that conforms to DIN 1053, Groups II, IIa, III or IIIa, or preferably plaster are approved for use.
- Optional plaster board trim panels

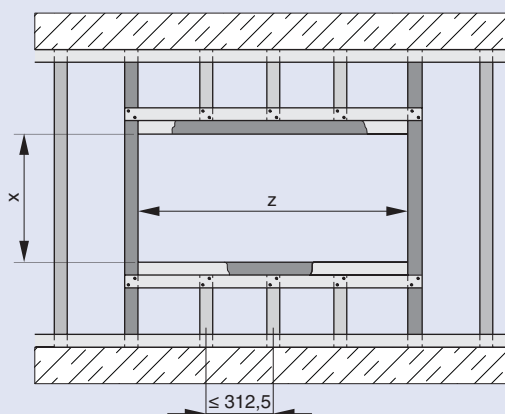
## Mortar based installation



Detail A



## Metal support structure for mortar based installation



$$x = H + 80 \dots 120 \text{ mm}$$

$$z = B + 80 \dots 120 \text{ mm}$$

# Installation details

In lightweight fire walls with metal support structure and clad on both sides

## Dry mortarless installation with installation kit

### Requirements

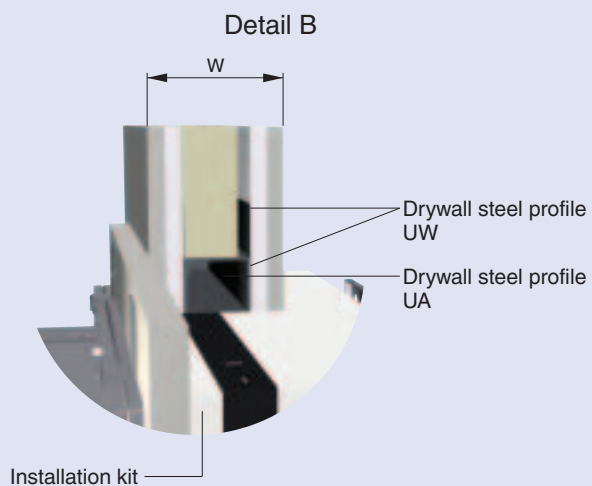
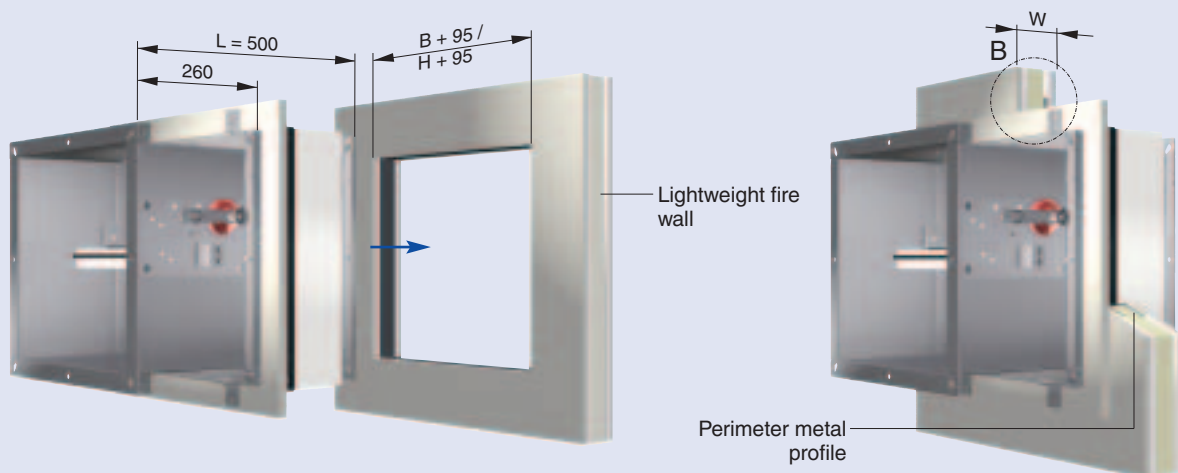
- Lightweight fire walls with metal support structure according to general appraisal certificate and minimum thickness 110 mm  
Knauf ABP P-3391/170/08, Rigips ABP P-3020/0109  
Lafarge ABP P-3391/0890, Promat ABP P-3796/7968
- Wall height maximum 5000 mm
- Casing length  $L = 500$  mm
- 180 mm minimum distance between two fire dampers
- Connection of rigid ducts using flexible connectors

### Installation details

- An opening with a minimum  $B + 95$  mm and  $H + 95$  mm is required

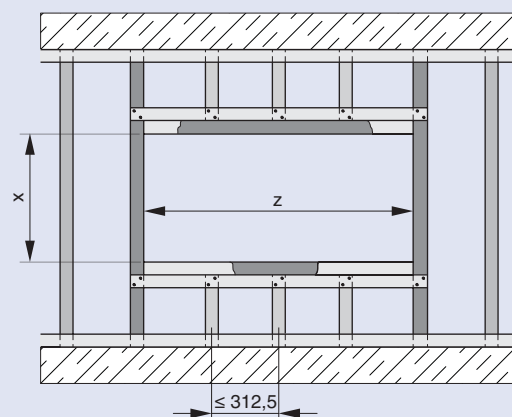
Further information about installation kit see page 10.

## Dry mortarless installation with installation kit



### Metal support structure

for dry mortarless installation with installation kit



$$x = H + 95 \text{ mm}$$

$$z = B + 95 \text{ mm}$$

# Order Details

## Specification text \*

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

Ready-for-operation unit contains a fire-resistant damper blade and a release mechanism. Fire resistance class: K90.

Tested for fire resistance properties according to DIN 4102 and EN 1366-2, with general building inspectorate licence Z-41.3-321 of the "Deutsches Institut für Bautechnik", Berlin.

For installation directly in solid walls, ceiling slabs, gypsum wall boards, lightweight partitions and lightweight fire walls, on the face of solid walls and ceiling slabs, adjacent to solid walls and ceiling slabs and remote from solid walls.

Special characteristics:

- Tested for fire resistance properties according to DIN 4102 and EN 1366-2
- Construction (LD) has lower sound power level and differential pressure
- Integration into the centralised BMS with TROXNETCOM

Fire damper model with:

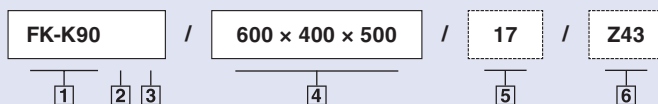
Spring return actuator with thermoelectric release mechanism. Two limit switches integrated into actuator for damper blade position indication "OPEN" and "CLOSED".

Casing made of galvanised sheet steel, damper blade made of special insulating material, blade mounting shaft and drive linkage of stainless steel, plain brass bearings, seals from polyurethane or elastomer.

\* Text for a FK-K90 with fusible link

Text for construction variants, attachments and accessories see design programme or our home page

## Order code



### 1 Type

#### 2 Construction variant 1

- Galvanised casing, no entry required
- 1 Powder-coated casing
- 2 Stainless steel casing
- 6 Sheet steel clad damper blade
- 7 Coated damper blade
- 1-6 Powder-coated casing and sheet steel clad damper blade
- 1-7 Powder-coated casing and coated damper blade
- 2-6 Stainless steel casing and sheet steel clad damper blade
- 2-7 Stainless steel casing and coated damper blade

### 3 Construction variant 2

- ...-W Release temperature 95 °C
- ...-LD With blade bead seal<sup>1</sup>

### 4 Nominal size

B x H x L

### 5 Attachments

None, no entry required  
11 to B4

### 6 Accessories

None, no entry required  
Z01 to ZEX2

<sup>1</sup> Combinations of width and height up to B x H = 800 mm x 400 mm as a standard construction FK-K90-LD is supplied. Construction with landing angles with bead seals on request.

## Order example FK-K90 with blade bead seal and fusible link

Make: TROX  
Type: FK-K90-LD / 600 x 400 x 500

## Order example FK-K90, with landing angles with bead seals, powder-coated, with operating side cover grille and spring return actuator 230 V AC

Make: TROX  
Type: FK-K90 - 1 / 1000 x 700 x 500 / 17 / Z43