



## BSK-EN

Fire damper

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**Certificate of consistency of performance**

1035-CPR-ES054987

**Declaration of performance**

01-01- DoP-BSK-EN-2014-10-29

## DESCRIPTION

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Fire dampers, installed in ventilation ducts (air conditioning systems), serve for the automatic locking of fire lobbies.

The fire damper BSK-EN complies with EN 15650, EN 13501-3 and EN 1366-2.

BSK-EN is tested according to EN 1366-2 in connection with Declaration of performance (DoP) no. 01-01- DoP- BSK-EN-2014-10-29.

It has the certificate of consistency of performance no. 1035-CPR-ES054987 according to EU-BauPVO.

Category according to EN 13501-3 is EI 120 ( $v_e, h_o i \leftrightarrow o$ ) S.

The national standards and directives must be observed in connection with the technical documentation Installation, mounting and operating instructions. For maintenance, service, retrofitting, etc., maintenance openings must be provided on site in suspended ceilings, shaft walls, connected ventilation ducts etc., if necessary. They must be built in in sufficient numbers and sizes and must not impair the functioning of the fire dampers. The fire dampers must be connected to the ventilation system by means of ventilation ducts either on one or on both sides. When connected on one side, finishing protective gratings made of non-flammable building materials (EN13501-1) must be provided on the opposite side. The fire dampers can be connected both on non-combustible and combustible ventilation ducts.

## MODELS

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- Housing made of galvanised sheet steel, cold and hot leakage requirements according to EN 1366-2 are met using circumferential PUR sealings and intumescent seals. Optionally (at an extra charge) with DD coating (two-component paint, PU-based), inside/outside.
- Moulded connecting flanges with centre hole, corner angle with long hole for simple channel mounting and high stability.
- Shut-off damper made of fibre-silicate board.
- Thermal release via fusible link 72°C or 98°C.
- Optimum integration in the building control system using SCHAKO signalling and switching bus system EasyBus (see technical documentation EasyBus).
- Application: operating pressure max. 1000 Pa at  $v_{stirn} \leq 10$  m/s.
- The installation position does not depend on the air flow direction.

## MAINTENANCE INFORMATION

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We would like to point out that only suitable cleaning materials may be used to clean the stainless steel version of fire dampers!

## ATTENTION

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Building systems have to be arranged, installed and maintained in such a way that they prevent fire and propagation of fire and smoke (fire propagation) and allow evacuation of persons and animals as well as efficient fire extinguishing work. Spreading of smoke through the ventilation and air conditioning systems can be efficiently prevented only with suitable electrical triggering device in combination with a smoke detection system.

Therefore, we recommend to equip fire dampers, for example with spring return actuators that can be triggered by the smoke detector.

## MODELS AND DIMENSIONS

### DIMENSIONS

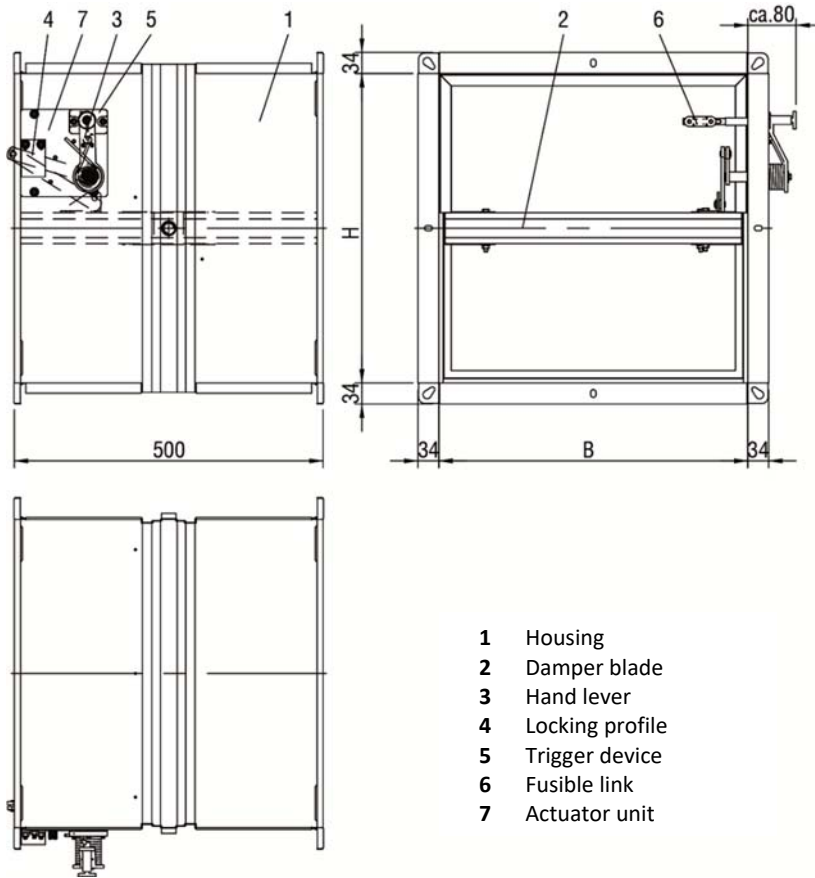


Figure 1: Dimension BSK-EN

Available sizes	
B [mm]	H [mm]
200	200
225	225
250	250
275	275
300	300
325	325
350	350
375	375
400	400
450	450
500	500
550	550
600	600
650	650
700	700
750	750
800	800
900	
1000	
1100	
1200	
1300	
1400	
1500	

Table 1: Available sizes

Housing length L= 500 mm.  
 All width and height dimensions can be combined.  
 Release device always on H side.  
 On request, the width and height dimensions are available in steps of 10 mm.

### FRAME BORE

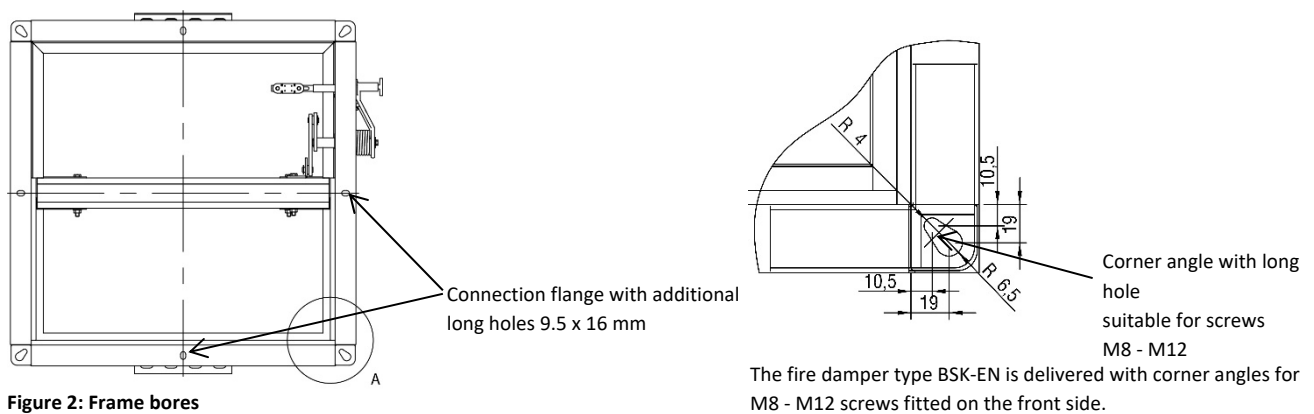


Figure 2: Frame bores

### DAMPER LEAF PROJECTING ENDS

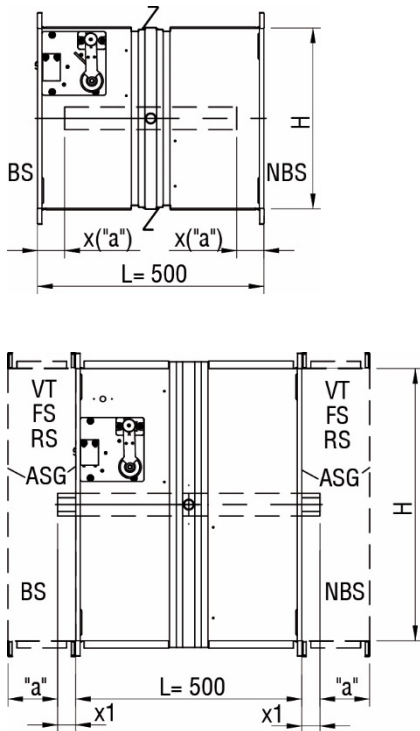


Figure 3: Damper leaf projecting ends

- BS: Operating side
- NBS: Non-operating side
- ASG: Finishing protective grating
- VT: Extension part
- FS: Flexible connecting piece
- RS: Pipe connecting piece

"a" = 50 mm: Minimum distance between the front edge of the open damper leaf and the finishing protective grating (ASG), flexible connecting piece (FS) or pipe connecting piece (RS).

H [mm]	Operating side (BS) Non-operating side (NBS) [mm]	
200	160	x
225	148	
250	135	
275	123	
300	110	
325	98	
350	85	
375	73	
400	60 <sup>(1)</sup>	
450	35 <sup>(2)</sup>	
500	10 <sup>(2)</sup>	x1
550	15 <sup>(2)</sup>	
600	40 <sup>(2)</sup>	
650	65 <sup>(2)</sup>	
700	90 <sup>(2)</sup>	
750	115 <sup>(2)</sup>	
800	140 <sup>(2)</sup>	

Table 2: Damper leaf projecting ends

<sup>(1)</sup> Extension part (VT) on the operating side (BS) necessary

<sup>(2)</sup> Extension part (VT) on both sides necessary

## MOUNTING INFORMATION

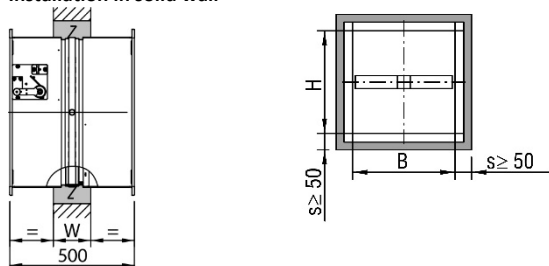
### INSTALLATION IN SOLID WALLS

- Installation in solid walls (shaft walls, shafts, ducts and fire walls) made of, for example concrete, masonry according to EN 1996 or DIN 1053; solid plaster board walls according to EN 12859 or DIN 18163; apparent density  $\geq 450 \text{ kg/m}^3$  and wall thickness  $W \geq 150 \text{ mm}$ .
- Installation with horizontal damper leaf.
- Circumferential gaps "s" must be filled completely with mortar of categories M2.5 to M15 according to EN 998-2, NM II to III DIN V 18580 (previously: MG II to III according to DIN 1053) or fire protection mortar of the corresponding grade or with concrete suitable for the wall type. The minimum gap size  $s_{\text{min}}$  is 50 mm. If the fire damper is installed during the construction of the wall, the gaps "s" can be omitted. The mortar bed depth has to be designed according to the minimum wall thickness and may not be less than this thickness.
- The distance between the fire dampers must be min. 200 mm.
- Distance to the bearing adjacent components (wall / solid ceiling) is minimum 75 mm.

### INSTALLATION IN SOLID CEILINGS

- Installation in solid ceilings, for example made of concrete, foam mortar; apparent density  $\geq 500 \text{ kg/m}^3$  and ceiling thickness  $D \geq 150 \text{ mm}$ .
- Installation with full mortar lining (circumferential gaps "s" must be filled completely with mortar of category M15 according to EN 998-2, NM II DIN V 18580 (previously: MG III according to DIN 1053) or fire protection mortar of the corresponding grade. The minimum gap size  $s_{\text{min}}$  is 50 mm. If the fire damper is installed during the construction of the ceiling, the gaps "s" can be omitted. The mortar bed depth has to be designed according to the minimum ceiling thickness and may not be less than this thickness.
- The distance between the fire dampers must be min. 200 mm.
- Distance to the bearing adjacent components (wall) is minimum 75 mm.

Installation in solid wall



Installation in solid ceilings



Figure 4: Installation in solid walls and ceilings

### CONNECTION OF VENTILATION DUCTS

The fire dampers must be connected to the ventilation ducts of the ventilation system either on one or on both sides. For one-sided connections, finishing protective grating made of non-combustible material (EN 13501-1) must be provided on the respective opposite sides. The fire dampers can be connected both to non-combustible and combustible ventilation ducts.

The local regulations or national standards on ventilation systems (in Germany e.g. LüAR) apply.

No inadmissible forces may affect the fire damper and space-enclosing components especially in case of fire and impair their fire resistance time. The required expansion joints (flexible connecting pieces) must be designed as flammable, elastic connecting pieces made of at least standard inflammable materials (EN 13501-1) and installed between the fire damper and ventilation duct. Flexible part of the connecting piece (polyester fabric) must have the minimum length of  $l_{\text{min}} = 100 \text{ mm}$  in the mounted state, this gives a mounting dimension of approx.  $L = 160 \text{ mm}$ . As an alternative, instead of installing flexible connecting pieces, flexible ventilation ducts made of aluminium can be connected. Ventilation ducts must be suspended separately.

## WITH VENTILATION DUCT ARRANGED ON ONE SIDE AND FINISHING PROTECTIVE GRATING

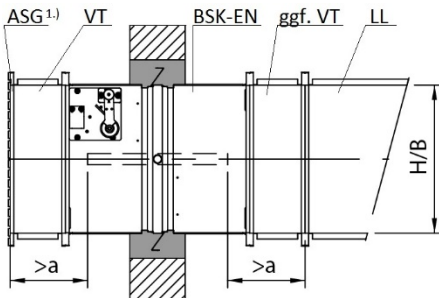


Figure 5: Connection example of a ventilation duct arranged on one side and a finishing protective grating

## ON BOTH SIDES WITH VENTILATION DUCTS

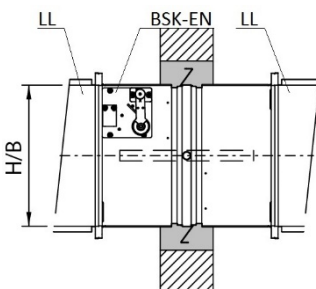


Figure 6: Connection example of ventilation ducts on both sides

- BSK-EN:** Fire damper BSK-EN  
**ASG** Finishing protective grating type ASG <sup>1.)</sup>  
**VT** Extension part type VT  
**FS** Flexible connecting piece type FS <sup>2.)</sup>  
**LL** Ventilation duct  
<sup>1.)</sup> made of non-combustible building materials (EN 13501-1)  
<sup>2.)</sup> min. standard flammable according to EN 13501-1

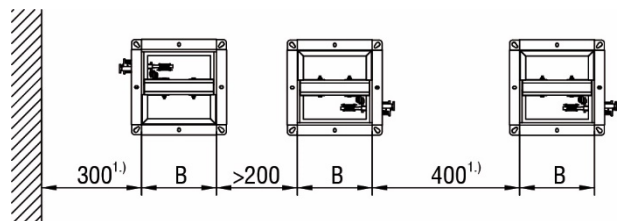
**a = 50 mm:** Minimum distance between the front edge of the open damper leaf and the finishing protective grating (ASG), flexible connecting piece (FS) or pipe connecting piece (RS).

## INSTALLATION INFORMATION

### MINIMUM DISTANCES

The specified dimensions should be considered as installation recommendation for BSK-EN and can deviate depending on the location. The fire damper must be installed to ensure fire protection according to the technical documentation Installation, mounting and operating instructions. Inspection openings are not available, therefore, they must be created in the direct vicinity in the connected ventilation ducts. Inspection openings are not available, therefore, they must be created in the direct vicinity in the connected ventilation ducts. Inspection openings must be freely accessible, ensure this especially when installing minimum 2 fire dampers next to each other or below each other or when installing them in the direct vicinity of bearing adjacent components.

#### Minimum distances<sup>1.)</sup>



1.) Minimum distances recommended by SCHAKO for better access during subsequent maintenance.

Figure 7: Minimum distances to adjacent components and BSK-EN to each other

**TECHNICAL DATA**

**PRESSURE LOSS AND NOISE LEVEL**

**Flow generated noise, damper width B = 600 mm**

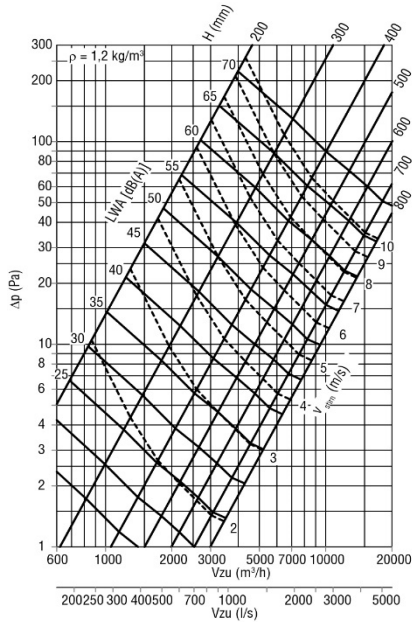


Diagram 1: Damper width B=600 mm

**Correction values B = 600 mm**

**with finishing protective grating**

$L_{WA} \times 1.11$

$\Delta p \times 2.85$

**Radiated noise:**

$L_{WA} - 8 \text{ [dB(A)]}$

B [mm]	Flow generated noise $L_{WA}$ [dB(A)]		Radiated noise $L_{WA \text{ Abst}}$ [dB(A)]		Pressure loss $\Delta p$ [Pa]	
	Without finishing protective grating	With finishing protective grating (ASG)	Without finishing protective grating	With finishing protective grating (ASG)	Without finishing protective grating	With finishing protective grating (ASG)
	$L_{WA1} \text{ [dB(A)]} = L_{WA} \text{ [dB(A)]} + KF_1$	$L_{WA2} \text{ [dB(A)]} = L_{WA1} \text{ [dB(A)]} \times KF_2$	$L_{WA \text{ Abst1}} \text{ [dB(A)]} = L_{WA1} \text{ [dB(A)]} + KF_3$	$L_{WA \text{ Abst2}} \text{ [dB(A)]} = L_{WA2} \text{ [dB(A)]} + KF_3$	$\Delta p_1 = \Delta p \times KF_4$	$\Delta p_2 = \Delta p_1 \times KF_5$
200	-3	1.05	-7	-7	2.15	1.66
250	-3	1.07	-7	-7	1.8	1.69
300	-2	1.09	-7	-7	1.55	1.72
350	-2	1.10	-7	-7	1.4	2.85
400	-2	1.11	-8	-8	1.3	2.85
450	-1	1.11	-8	-8	1.2	2.85
500	-1	1.11	-8	-8	1.15	2.85
550	-1	1.11	-8	-8	1.05	2.85
600	0	1.11	-8	-8	1	2.85
650	1	1.11	-9	-9	1	2.85
700	1	1.11	-9	-9	0.95	2.85
750	1	1.11	-9	-9	0.9	2.85
800	1	1.11	-9	-9	0.9	2.85
900	1	1.11	-9	-9	0.85	2.85
1000	2	1.11	-9	-9	0.85	2.85
1100	3	1.11	-9	-9	0.85	2.85
1200	4	1.11	-9	-9	0.85	2.85
1300	4	1.11	-9	-9	0.8	2.85
1400	4	1.11	-9	-9	0.8	2.85
1500	5	1.11	-9	-9	0.8	2.85

Table 3: Correction factor for pressure loss and noise level depending on different widths B [mm], at the same flow rate

**WEIGHTS**

L= 500 mm, with manual triggering (added weight for actuators: max. 4 kg)

		Weight table [kg]																			
		Width (mm)																			
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
Height (mm)	200	9.5	10.4	11.3	12.2	13.1	14.1	15.0	15.9	16.8	17.7	18.7	19.6	20.5	22.3	24.2	26.0	27.9	29.7	31.5	33.4
	250	10.4	11.4	12.4	13.4	14.4	15.3	16.3	17.3	18.3	19.3	20.3	21.3	22.3	24.3	26.3	28.2	30.2	32.2	34.2	36.2
	300	11.3	12.4	13.4	14.5	15.5	16.6	17.7	18.7	19.8	20.9	21.9	23.0	24.1	26.2	28.3	30.4	32.6	34.7	36.8	38.9
	350	12.2	13.4	14.5	15.6	16.8	17.9	19.0	20.2	21.3	22.4	23.6	24.7	25.8	28.1	30.4	32.6	34.9	37.2	39.4	41.7
	400	13.1	14.4	15.5	16.8	18.0	19.2	20.4	21.6	22.8	24.0	25.2	26.4	27.6	30.0	32.4	34.9	37.3	39.7	42.1	44.5
	450	14.1	15.3	16.6	17.9	19.2	20.5	21.7	23.0	24.3	25.6	26.8	28.1	29.4	31.9	34.5	37.1	39.6	42.2	44.7	47.3
	500	15.0	16.3	17.7	19.0	20.4	21.7	23.1	24.4	25.8	27.1	28.5	29.8	31.2	33.9	36.6	39.3	42.0	44.7	47.3	50.1
	550	15.9	17.3	18.7	20.2	21.6	23.0	24.4	25.8	27.3	28.7	30.1	31.5	32.9	35.8	38.6	41.5	44.3	47.2	50.0	52.8
	600	16.8	18.3	19.8	21.3	22.8	24.3	25.8	27.3	28.8	30.3	31.7	33.2	34.7	37.7	40.7	43.7	46.7	49.6	52.6	55.6
	650	17.7	19.3	20.9	22.4	24.0	25.6	27.1	28.7	30.3	31.8	33.4	34.9	36.5	39.6	42.8	45.9	49.0	52.1	55.3	58.4
700	18.7	20.3	21.9	23.6	25.2	26.8	28.5	30.1	31.7	33.4	35.0	36.7	38.3	41.5	44.8	48.1	51.4	54.6	57.9	61.2	
750	19.6	21.3	23.0	24.7	26.4	28.1	29.8	31.5	33.2	34.9	36.7	38.4	40.1	43.5	46.9	50.3	53.7	57.1	60.5	64.0	
800	20.5	22.3	24.1	25.8	27.6	29.4	31.2	32.9	34.7	36.5	38.3	40.1	41.8	45.4	49.0	52.5	56.1	59.6	63.2	66.7	

Table 4: Weight table [kg]

**FREE CROSS-SECTION**

		Free cross-section [m <sup>2</sup> ]																			
		Width [mm]																			
		200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
Height (mm)	200	0.018	0.023	0.029	0.034	0.040	0.045	0.051	0.056	0.062	0.067	0.073	0.078	0.084	0.095	0.106	0.117	0.128	0.139	0.150	0.161
	250	0.026	0.034	0.042	0.050	0.058	0.066	0.074	0.082	0.090	0.098	0.106	0.114	0.122	0.138	0.154	0.170	0.186	0.202	0.218	0.234
	300	0.034	0.044	0.055	0.065	0.076	0.086	0.097	0.107	0.118	0.128	0.139	0.149	0.160	0.181	0.202	0.223	0.244	0.265	0.286	0.307
	350	0.042	0.055	0.068	0.081	0.094	0.107	0.120	0.133	0.146	0.159	0.172	0.185	0.198	0.224	0.250	0.276	0.302	0.328	0.354	0.380
	400	0.050	0.065	0.081	0.096	0.112	0.127	0.143	0.158	0.174	0.189	0.205	0.220	0.236	0.267	0.298	0.329	0.360	0.391	0.422	0.453
	450	0.058	0.076	0.094	0.112	0.130	0.148	0.166	0.184	0.202	0.220	0.238	0.256	0.274	0.310	0.346	0.382	0.418	0.454	0.490	0.526
	500	0.066	0.086	0.107	0.127	0.148	0.168	0.189	0.209	0.230	0.250	0.271	0.291	0.312	0.353	0.394	0.435	0.476	0.517	0.558	0.599
	550	0.074	0.097	0.120	0.143	0.166	0.189	0.212	0.235	0.258	0.281	0.304	0.327	0.350	0.396	0.442	0.488	0.534	0.580	0.626	0.672
	600	0.082	0.107	0.133	0.158	0.184	0.209	0.235	0.260	0.286	0.311	0.337	0.362	0.388	0.439	0.490	0.541	0.592	0.643	0.694	0.745
	650	0.090	0.118	0.146	0.174	0.202	0.230	0.258	0.286	0.314	0.342	0.370	0.398	0.426	0.482	0.538	0.594	0.650	0.706	0.762	0.818
700	0.098	0.128	0.159	0.189	0.220	0.250	0.281	0.311	0.342	0.372	0.403	0.433	0.464	0.525	0.586	0.647	0.708	0.769	0.830	0.891	
750	0.106	0.139	0.172	0.205	0.238	0.271	0.304	0.337	0.370	0.403	0.436	0.469	0.502	0.568	0.634	0.700	0.766	0.832	0.898	0.964	
800	0.114	0.149	0.185	0.220	0.256	0.291	0.327	0.362	0.398	0.433	0.469	0.504	0.540	0.611	0.682	0.753	0.824	0.895	0.966	1.037	

Table 5: Free cross-section [m<sup>2</sup>]



## ACCESSORIES

### Available at an extra charge:

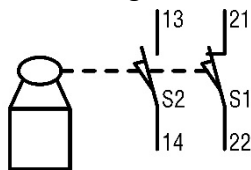
- Model with additional DD coating (solvent-based two-component paint, PU-based - RAL 7035 / light grey) inside/outside.
- Thermal release via fusible link 98°C.
- Electric spring return actuators B10/B11, B20/B21, B30/B31, B40.
- Signalling and switching bus system type EasyBus.
- Finishing protective grating type ASG <sup>1.)</sup>.
- Extension part type VT <sup>1.)</sup>.
- Pipe connecting piece type RS <sup>1.)</sup>.

<sup>1.)</sup> Standard model galvanised sheet steel, powder-coated (RAL 9010 / pure white) and DD coating (RAL 7035 / light grey) possible.

### LIMIT SWITCH TYPE ES

Electric limit switch for position indicators "OPEN" and/or "CLOSED". Switching element including one NC and one NO contact each, 4 connections for M3.5 screw terminals for max. 2 mm<sup>2</sup>. 250 V AC, I<sub>e</sub> 6A, IP67 using suitable cable glands M20 (on-site).

#### ES circuit diagram



Damper positions that can be displayed:

Type ES 1 Z : "CLOSED"  
 Type ES 1 A : "OPEN"  
 Type ES 2 : "OPEN"  
 and "CLOSED"

Figure 8: Circuit diagram Limit switch type ES

#### Limit switch type Easy-Eco-Tx

Technical description and documents: see technical documentation signalling and switching bus system EasyBus.

**ELECTRIC SPRING RETURN ACTUATOR**  
**B10/B11/B20/B21**

B10 (BFL24-T-ST SO), B11 (BFL230-T SO)  
 B20 (BFN24-T-ST SO), B21 (BFN230-T SO)

**Connection diagram B10/B11/B20/B21**

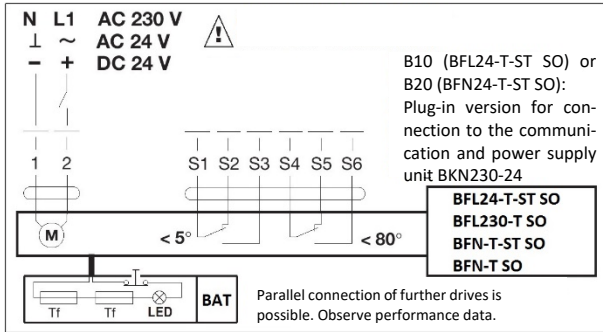


Figure 9: Connection diagram B10/B11/B20/B21

**ELECTRIC SPRING RETURN ACTUATOR B30/B31**

B30 (BF24-T-ST SO), B31 (BF230-T SO)

**Connection diagram B30/B31**

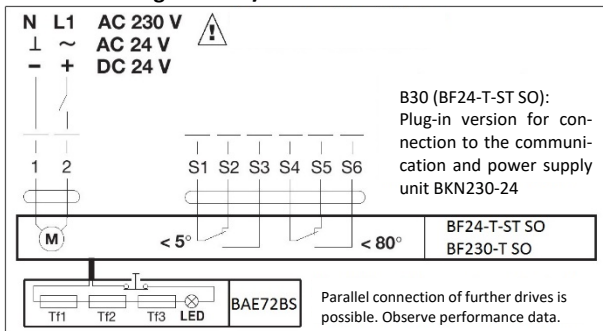


Figure 10: Connection diagram B30/B31

**ELECTRIC SPRING RETURN ACTUATOR B40**

B40 (BF24TL-T-ST SO)

**Connection diagram B40**

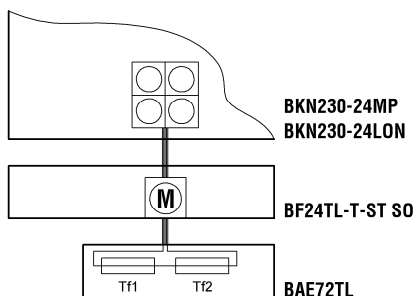


Figure 11: Connection diagram B40

**Electric spring return actuator with thermoelectric release device BAT or BAE72B-S.**

- Release temperature 72°C optional 95°C and 120°C (for hot-air heating).
- Operating position (damper "OPEN") and tensioning of the return spring by applying the supply voltage.
- 24V actuators with connectors that can be removed on site if required.
- Safety position (damper "CLOSED") through spring force when supply voltage is interrupted or the temperature fuses (ambient temperature or internal duct temperature) respond. Reaction of the thermal fuses interrupts the supply voltage permanently.
- Display of the damper end positions is possible by means of integrated micro switches via potential-free changeover contacts (S1 – S3 "CLOSED" indicates the closed position; S4 – S6 "OPEN" indicates the opened position).
- Manual actuation and fixing in any position is possible in the de-energised state. It is unlocked manually.
- On-site function control is possible by means of the control key of BAT or BAE72B-S.
- Spare parts: Temperature fuse for temperature inside the duct 72°C/95°C/120°C (ZBAT72 or ZBAE72 and ZBAT95 or ZBAE95 and ZBAT120). Exchange takes place by unscrewing the two screws of the thermoelectric release device. Remove the thermoelectric trigger device from the actuator unit. Remove the internal duct temperature fuse from the thermoelectric release device and replace it with a new internal duct temperature fuse (ZBAT... or ZBAE...). Screw the thermoelectric trigger device back onto the actuator unit. For any other damage, the entire "actuator/thermal release device" unit must be replaced completely.

**Electric spring return actuator with thermoelectric trigger device BAE72TL.**

- Trigger temperature 72°C optionally 95°C (for hot-air heating).
- Supply voltage 24V AC/DC including connector.
- Connection to LON or Belimo MP bus systems is possible via communication and power supply units BKN230-24LON or BKN230-24MP.

Further technical data are available on request.



The safety function is only guaranteed if the drive has been connected to the supply voltage in accordance with regulations.

### Motor graduation and damper dimensions

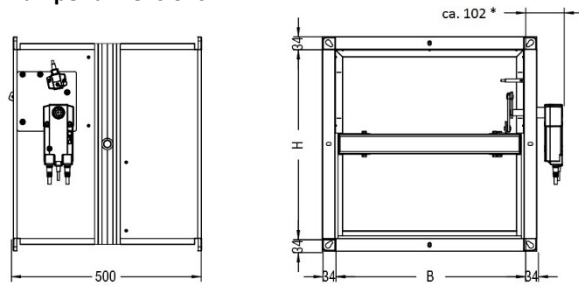
#### Motor graduation

Höhe (H) [mm]	Breite (B) [mm]																							
	200	225	250	275	300	325	350	375	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
225	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
250	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
275	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
300	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
325	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
350	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
375	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
400	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
450	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
500	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
550	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
600	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
650	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
700	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
750	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal
800	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal	Diagonal

- B10 (BFL24-T-ST SO) bzw. B11 (BFL230-T SO)
- B20 (BFN24-T-ST SO) bzw. B21 (BFN230-T SO)
- B30 (BF24-T-ST SO) bzw. B31 (BF230-T SO)

Table 6: Motor graduation

#### Damper dimensions



- \* BSK- EN with B10/B11 approx. 102 mm
- \* BSK- EN with B20/B21 approx. 106 mm
- \* BSK- EN with B30/B31 approx. 120 mm

Figure 12: Damper dimensions

**Technical data of spring return actuators**

24 V actuators	B10 (BFL24-T-ST-SO)	B20 (BFN24-T-ST-SO)	B30 (BF24-T-ST-SO)
Nominal voltage	AC/DC 24 V		
Rated voltage frequency	50/60 Hz		
Functional range	AC 19.2...28.8 V/DC 21.6...28.8 V		
Power consumption during operation	2.5 W	4 W	7 W
Power consumption in idle position	0.8 W	1.4 W	2 W
Power consumption/dimensioning	4 VA/I <sub>max</sub> 8.3 A @ 5 ms	6 VA/I <sub>max</sub> 8.3 A @ 5 ms	10 VA/I <sub>max</sub> 8.3 A @ 5 ms
Auxiliary switch	2 x EPU		
Switching capacity of auxiliary switch	1 mA...3 (0.5 inductive) A, AC 250 V		1 mA...6 (3) A, DC 5 V...AC 250 V
Connection of supply / control	Cable 1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free), with 3-pin connector		
Auxiliary switch connection	Cable 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free), with 6-pin connector		
Motor runtime	<60 s / 90°		< 120 s/90°
Spring return runtime	20s @ -10...55°C / <60s @ -30...-10°C		~ 16 s @ -20°C
Protection class IEC/EN	Safety extra low voltage III		
Protection class auxiliary switch IEC/EN	II protective insulation		
Degree of protection IEC/EN	IP54		
Ambient temperature Normal operation	-30 ... 55°C		-30 ... 50°C
Storage temperature	-40 ... 55°C		-40 ... 50°C
Ambient humidity	95% r.H., non-condensing		

**Table 7: Technical data 24 V actuators**

230 V actuators	B11 (BFL230-T SO)	B21 (BFN230-T SO)	B31 (BF230-T SO)
Nominal voltage	AC 230 V		
Rated voltage frequency	50/60 Hz		
Functional range	AC 198 ... 264 V		
Power consumption during operation	3.5 W	5 W	8.5 W
Power consumption in idle position	1.1 W	2.1 W	3 W
Power consumption/dimensioning	6.5 VA/I <sub>max</sub> 4A @ 5 ms	10 VA/I <sub>max</sub> 4A @ 5 ms	11 VA/I <sub>max</sub> 500 mA @ 5 ms
Auxiliary switch	2 x EPU		
Switching capacity of auxiliary switch	1 mA...3 (0.5 inductive) A, AC 250 V		1 mA...3 (0.5 inductive) A, AC 250 V
Connection of supply / control	Cable 1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)		
Auxiliary switch connection	Cable 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)		
Motor runtime	<60 s / 90°		< 120 s/90°
Spring return runtime	20s @ -10...55°C / <60s @ -30...-10°C		~ 16 s @ -20°C
Protection class IEC/EN	II protective insulation		
Protection class auxiliary switch IEC/EN	II protective insulation		
Degree of protection IEC/EN	IP54		
Ambient temperature Normal operation	-30 ... 55°C		-30 ... 50°C
Storage temperature	-40 ... 55°C		-40 ... 50°C
Ambient humidity	95% r.H., non-condensing		

**Table 8: Technical data 24 V actuators**

### EXTENSION PART TYPE VT

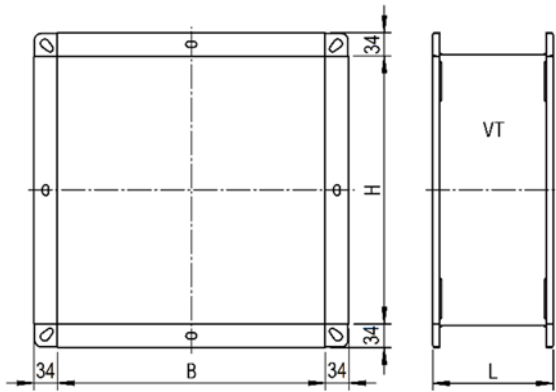


Figure 13: Extension part type VT

- Extension part made of profiled sheet steel fitted with connecting flanges.
- Intended use: for large wall/ceiling thicknesses, in order to maintain a minimum distance  $a_{min} = 50$  mm from the open damper blade when fitting protective finishing grating type ASG, flexible connecting pieces type FS or connecting pipes type RS

H [mm]	L [mm]
200	180
250	
300	
350	
400	
450	
500	
550	
600	
650	
700	
750	
800	210

The L dimension depends on the height.

Table 9: Length of the extension part type VT depending on the fire damper height

### FLEXIBLE CONNECTING PIECE TYPE FS

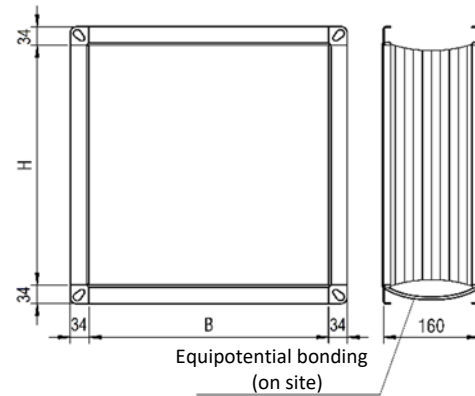
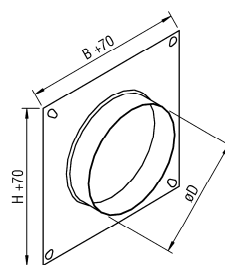


Figure 14: Flexible connecting piece type FS

- Flexible connecting piece consisting of profiled connection flanges (galvanised sheet steel) with elastic intermediate piece made of polyester fabric PVC-coated on both sides, standard flammable according to EN 13501-1, with welded lip seals (sealing degree C according to EN 13180 / EN 1507; temperature-resistant from -20° to 80°C). Flexible part of the connecting piece (polyester fabric) must have a length  $l_{min}$  of 100 mm when mounted, this gives an installation dimension of approx.  $L=160$  mm.
- The required equipotential bonding must be carried out on-site according to the VDE or local regulations. The fire dampers must not be subject to mechanical stress under any circumstances.
- Flexible ventilation ducts made of steel or aluminium can be used instead of the flexible connection pieces.
- Flexible spigot must be installed in the scrapped state. This may reduce the free cross section. An extension piece may be necessary.
- For  $H \geq 400$ , observe table 2 page 4.

### DUCT CONNECTION SPIGOT TYPE RS

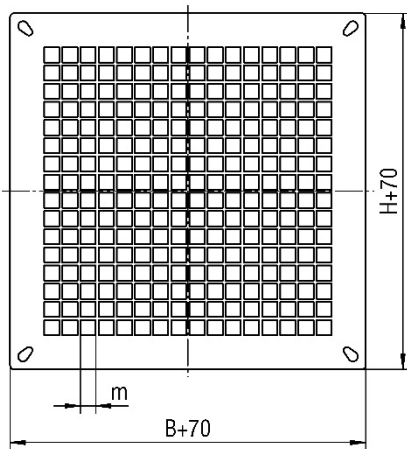


W x H [mm]	øD [mm]
200x200	198
250x250	248
400x400	398
450x450	448
500x500	498
600x600	558
650x650	628
750x750	708
800x800	798

Figure 15: Pipe connecting piece type RS

- Pipe connecting pieces with joining plate, galvanised sheet steel.
- Intended use: connection/transition fire damper to round ducts.
- Other dimensions on request.
- For  $H \geq 400$ , observe table 2 page 4.

**SECURITY GRILLE TYPE ASG**



**Figure 16: Finishing protective grating type ASG**

- Wire or punch grid with a mesh size of  $\leq 20$  mm.
- Intended use: mounting for one-sided connection.
- Minimum distance  $a_{\min} = 50$  mm from open damper blade must be considered; if necessary, use extension part type VT.
- For  $H \geq 400$ , observe table 2 page 4.

**LEGEND**

$V_{ZU}$	[m <sup>3</sup> /h] [l/s]	= Supply air volume
$\Delta p_{st}$	[Pa]	= Static pressure
$L_{WA}$	[dB(A)]	= A-weighted sound power level
$v_{stirn}$	[m/s]	= Face velocity
$\rho$	[kg/m <sup>3</sup> ]	= Density
B	[mm]	= Width
H	[mm]	= Height
$L_{WA1}$	[dB(A)]	= A-weighted sound power level of the flow-generated noise, adjusted for different values of B [mm]
$KF_1$	[dB(A)]	= Correction factor of sound power level, of the flow generated noise, adjusted for different values of B [mm]
$L_{WA2}$	[dB(A)]	= A-weighted sound power level of the flow-generated noise, adjusted for different values of B [mm], in the model with finishing protective grating (ASG)
$KF_2$	[dB(A)]	= A-weighted sound power level of the flow-generated noise, adjusted for different values of B [mm], in the model with finishing protective grating (ASG)
$L_{WA\text{ Abst}1}$	[dB(A)]	= A-weighted sound power level of the radiated noise, adjusted for different values of B [mm]
$L_{WA\text{ Abst}2}$	[dB(A)]	= A-weighted sound power level of the radiated noise, adjusted for different values of B [mm], in the model with protective grating (ASG)
$KF_3$	[dB(A)]	= Correction factor of sound power level of the radiated noise, adjusted for different values of B [mm], in the model with and without protective grating (ASG)
$\Delta p$	[kPa]	= Static pressure loss
$\Delta p_1$	[kPa]	= Static pressure loss, adjusted for different values of B [mm]
$KF_4$	[dB(A)]	= Correction factor of the static pressure loss, for different values of B [mm]
$\Delta p_2$	[kPa]	= Static pressure loss, adjusted for different values of B [mm], in the model with protective grating (ASG)
$KF_5$	[dB(A)]	= Correction factor of the static pressure loss, for different values of B [mm], in the model with protective grating (ASG)

## SPECIFICATION TEXT

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BSK-EN is tested according to EN 1366-2 in connection with Declaration of performance (DoP) no. 01-01- DoP- BSK-EN-2014-10-29.

It has the certificate of consistency of performance according to EU-BauPVO 1035-CPR-ES054987. The category according to EN 13501-3 is EI 120 (v<sub>e</sub>, h<sub>o</sub> i↔o) S.

- Housing made of galvanised sheet steel, cold and hot leakage requirements according to EN 1366-2 are met using circumferential PUR sealings and intumescent seals. Optionally (at an extra charge) with DD coating (two-component paint, PU-based), inside/outside.
- Moulded connecting flanges with centre hole, corner angle with long hole for simple channel mounting and high stability.
- Shut-off damper made of fibre-silicate board.

For connection to ventilation ducts (one- or two-sided), air flow direction optional.

Installation:

- with horizontal damper leaf axle
- in solid walls and solid ceilings

Product: SCHAKO **type BSK-EN**  
CE marking: 1035-CPR-ES054987

Dimensions:

Width (B): ..... mm

Height (H): ..... mm

Length (L): 500 mm

Model: right / left

(Unless specified otherwise in the order details, the mechanical model "Right" and fusible link with trigger temperature 72°C is supplied).

### Alternative models or accessories (at an extra charge)

("select as required").

- Housing with DD coating (solvent-based two-component paint, PU-based - RAL 7035 / light grey).
- Electric limit switch type ES for position indicators "OPEN" or/and "CLOSED", switching element with an NC and NO contact respectively:
  - Type ES 1 Z : "CLOSED"
  - Type ES 1 A : "OPEN"
  - Type ES 2: "OPEN" and "CLOSED"
- Electric spring return actuator with thermoelectric release device BAT or BAE72B-S.
  - Releases at a duct inside temperature of 72°C (optionally: 95°C and 120°C) containing integrated micro switches for indication of damper end positions (24 V drive with connector).
  - Type B10 (BFL24-T-ST SO)  
B11 (BFL130-T SO)  
B20 (BFN24-T-ST SO)  
B21 (BFN230-T SO)  
B30 (BF24-T-ST SO)  
B31 (BF230-T SO)
- Electrical spring return drive with thermoelectric release device BAE72TL
  - Releases at a duct inside temperature of 72°C (optionally: 95°C) containing integrated micro switches for indication of damper end positions, connection to LON or Belimo MP bus systems possible via communication devices. Available for all dimensions.
  - Type B40 (BF24TL-T-ST SO; 24V AC/DC)
  - Communication device BKN230-24LON for connection to LON bus system
  - Communication device BKN230-24MP for connection to Belimo MP bus system

**Extension part type VT**, for installation with large wall/ceiling thicknesses; to maintain the minimum distance  $a_{min} = 50$  mm from the open damper leaf when mounting the finishing protective grating type ASG, flexible connecting piece type FS or pipe connecting piece type RS. Extension part made of galvanised profiled sheet steel fitted with connecting flanges, L=180 mm (damper height 200 to 750 mm), L=210 mm (damper height 800 mm).

Product: SCHAKO **type VT**

Dimensions:

Width (B): ..... mm

Height (H): ..... mm

- Extra charge for anticorrosive paint - inside/outside - DD coating (two-component paint, PU-based - RAL 7035 / light grey)
- Extra charge for powder coating, inside/outside (RAL 9010 / pure white)

**Flexible connecting piece type FS** consisting of profiled connection flanges (galvanised sheet steel) with elastic intermediate piece made of polyester fabric PVC-coated on both sides, standard flammable according to EN 13501-1, with welded lip seals (sealing degree C according to EN 13180 / EN 1507; temperature-resistant from -20° to 80°C). Flexible part of the connecting piece (polyester fabric) must have a length  $l_{min}$  of 100 mm when mounted, this gives an installation dimension of approx. L=160 mm.

The required equipotential bonding must be implemented on-site according to the VDE or local regulations. The fire dampers must not be subject to mechanical stress under any circumstances.

Product: SCHAKO **type FS**

Dimensions:

Width (B): ..... mm

Height (H): ..... mm

**Finishing protective grating ASG**, for mounting with ventilation duct connection only one side, galvanised sheet steel, mesh size  $\leq 20$  mm, minimum distance  $a_{min} = 50$  mm from the open damper blade must be taken into account, if necessary, use extension part type VT.

Product: SCHAKO **type ASG**

Dimensions:

Width (B): ..... mm

Height (H): ..... mm

- Extra charge for anticorrosive paint - inside/outside - DD coating (two-component paint, PU-based - RAL 7035 / light grey)
- Extra charge for powder coating (RAL 9010 / pure white)

**Pipe connecting pieces type RS**, for connecting round ventilation ducts to BSK-EN, consisting of joining plate with bores and pipe connecting piece, galvanised sheet steel.

Product: SCHAKO **type RS**

Dimensions (W;H according to damper size):

Width (B): ..... mm

Height (H): .....mm

Duct connecting piece  $\varnothing$  ( $\varnothing D$ ):.....mm

- Extra charge for anticorrosive paint - inside/outside - DD coating (two-component paint, PU-based - RAL 7035 / light grey)
- Extra charge for powder coating, inside/outside (RAL 9010 / pure white)



**IDENTIFICATION LABEL**

 1035	13
 SCHAKO Iberia S.L. Pol. Ind. Río Gállego, Calle B, nave 3 E-50840 San Mateo de Gállego (Zaragoza)	
14 ESPAÑA 01-01-DoP-BSK-EN-2014-10-29	
<b>EN 15650:2010</b> <b>Fire damper</b> <b>BSK-EN</b>	
EI            120            (v <sub>e</sub> i↔o)            S EI 120 (h <sub>o</sub> i↔o) S	

Figure 17: Identification label

## MAINTENANCE OR FUNCTIONAL TEST

Unclean and humid air can impair the continuous operational safety. Therefore, after commissioning of the ventilation installation, the function of all fire dampers must be checked semi-annually.

If two consecutive functional checks do not show any defects, the fire dampers only have to be tested once a year. If maintenance agreements are made, for example for ventilation installations, it is recommended to include the functional tests of the fire dampers in these maintenance agreements.

## 1. Manual trigger device

### 1.1 External check

#### 1.1.1 Visual inspection

- Check the fire damper for damage and contamination.
- Perform necessary cleaning work.

#### 1.1.2 Manual triggering – Closing the fire damper

- Pull the disc (pos. 1) at the hand lever (pos. 2), this releases the locking (in the open position) of the locking bolt (pos. 4) in the trigger device (pos. 3).
- The hand lever is released and is moved by spring force in the direction of the closed position.

**ATTENTION! Do not reach into the swivelling range of the damper leaf and hand lever. There is a risk of injury.**

- The fire damper must close automatically.

#### 1.1.3 Test of the snap-in locking device

- Pull the disc (pos. 1) at the hand lever (pos. 2) in the closed position and release it again.
- The return must be performed automatically.

#### 1.1.4 Fire damper open

- Pull the disc (pos. 1) at the hand lever (pos. 2) and move it in the direction of the trigger device (pos. 3).
- The locking pin (pos. 4) must engage in the trigger device (pos. 3).
- The fire damper is ready for operation again.
- After successful manual triggering, repeat the process several times as described in section 1.1.2.

## 1.2 Internal check

### 1.2.1 Visual inspection

- Check the fire damper for damage and contamination.
- Perform necessary cleaning work.

### 1.2.2 Check of the trigger device

- Perform manual triggering as described in section 1.1.2.
- Remove the fastening screws (2 pieces) (pos.5), pull the trigger device out of the housing.
- Contract the fusible link holder (pos. 6) by means of a suitable tool (pliers, vice etc.) and removed the fusible link (pos. 7).
- Check the fusible link; if no damage is visible, insert the fusible link again.
- Install the trigger device again and tighten it by means of screws.

### BSK-EN with manual trigger

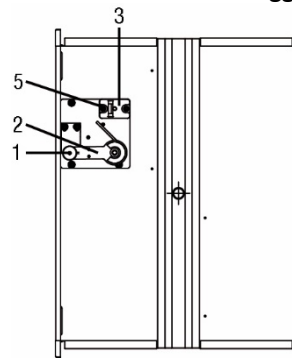
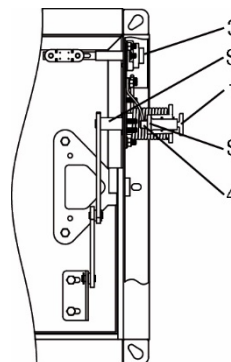


Figure 1.1: Side view



S= moving parts (storage), lubricate only if not running smoothly

Figure 1.2: Front view

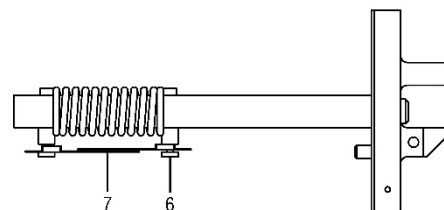


Figure 1.3: Trigger device

## 2. Trigger device with electric spring return actuator

### 2.1 External check

#### 2.1.1 Visual inspection

- Check the fire damper for damage and contamination.
- Perform necessary cleaning work.

#### 2.1.2 Thermoelectric triggering – Closing the fire damper

- Press switch (pos. 1) on the thermoelectric trigger device (pos. 2), thus, the spring return actuator is disconnected from the power supply (pos. 3) (alternatively: interrupt on-site power supply).
- Fire damper must close automatically, locking is performed by blocking the spring return actuator.

After successful thermoelectric triggering, repeat the process several times as described in section 2.1.2.

### 2.2 Internal check

#### 2.2.1 Visual inspection

- Check the fire damper for damage and contamination.
- Perform necessary cleaning work.

#### BSK-EN with electric spring return actuator

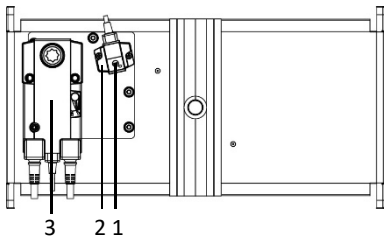


Figure 2.1: Side view

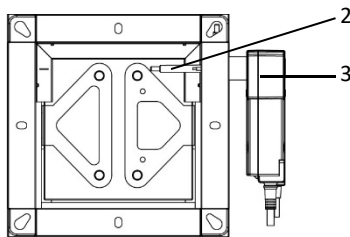


Figure 2.2: Front view

**SAMPLE OF FUNCTIONAL TEST PROTOCOL**

Functional test protocol for fire dampers

Cons. \_\_\_\_\_ no. \_\_\_\_\_

Fire damper no. : \_\_\_\_\_  
 Declaration of performance no. : \_\_\_\_\_  
 Series : \_\_\_\_\_  
 Release device : \_\_\_\_\_

The following function steps have been carried out according to the documents Installation, mounting and operating instructions	before commissioning	Next functional check in: _____	Next functional check in: _____	Next functional check in: _____	Next functional check in: _____
External check: Sys-tem: _____ Item: _____	✓	✓			
Internal check: Sys-tem: _____ Item: _____	✓	✓			
Additional check: Sys-tem: _____ Item: _____	✓	✓			
without defects Date / Tester					
with defects (see back) Date / Tester					
without defects Date / Tester					

Functional test protocol for fire dampers  
Cons. no. \_\_\_\_\_

Defects found during the test on: \_\_\_\_\_

*Sluggishness due to soiling.  
Any remaining mortar must be removed.*

---

Defects found during the test on: \_\_\_\_\_

---

Defects found during the test on: \_\_\_\_\_

---

Defects found during the test on: \_\_\_\_\_

SAMPLE