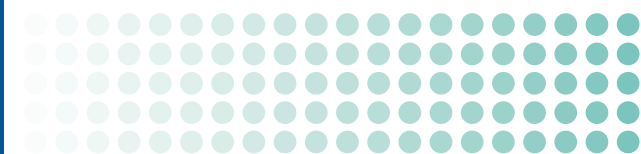


# Systemair Fire damper

[www.systemair.com](http://www.systemair.com)



## Circular Fire Dampers



### **PK-I-R-EI60S, -EI90S and -EI120S**

Systemair Fire dampers are manufactured to comply with latest European Standards. With wide product range and sizes for 60, 90 and 120 minute resistance for round and rectangular ducting.

All dampers as standard are designed and certified for EI-S performance conformity.

PK-I fire damper units are designed to be imbedded into the fire partition walls. Installation of these units are clearly indicated on pages 7-9.

All units as standard are available with manual rearmament lever and Actuator driven with optional accessories such as micro-switches, Electromagnets and communication controller units.

### **Fire Dampers with manual rearmament lever**

Fire Damper is set to closed position when thermal-fuse link is ruptured or a signal is given to the Electromagnet to release the damper blade from open to closed position.

After closure, the damper blade is secured in closed position mechanically and can only be opened manually.

Fusible link manufactured and secured in position with a Bi-metal solution which is designed to release the link mechanism when the air temperatures in the duct system reach 72 °C with tolerance  $\pm 1,5$  °C for the period of 30 to 60 seconds.

Electromagnet maintains the damper blade in open position by maintaining the current through its mechanism. Upon shut-off electrical current, the Electromagnet automatically releases the damper blade mechanism and then the closed or safe position is reached. The damper blade can only be placed in operation by manually releasing the mechanism from the closed position and enabling the current through the electromagnet to hold the damper blade mechanism in open position.

### **Actuator driven fire dampers**

Fire damper can be equipped with actuator that closes the damper blade on demand of Building Management System or signal received from electro-thermal fuse. As standard all actuator fitted fire dampers are equipped with electro-thermal fuse, which when reaching or exceeds ambient temperature of 72 °C with tolerance  $\pm 1,5$  °C, releases actuator and closes the damper blade to safe position within 60 seconds.



**Round fire dampers are conformed to EN 1366-2 and are classified as in accordance to EN13501-3:2005:**

PK-I-EI60S-ZV, DV7 and DV9  
For Dimensions Ø100mm to Ø630mm  
Certification No: SK01-ZSV-0159  
Test Report No: FIRES-CR-004-08-NURE

**EI 60 (v<sub>e</sub> h<sub>o</sub> i↔o) S**

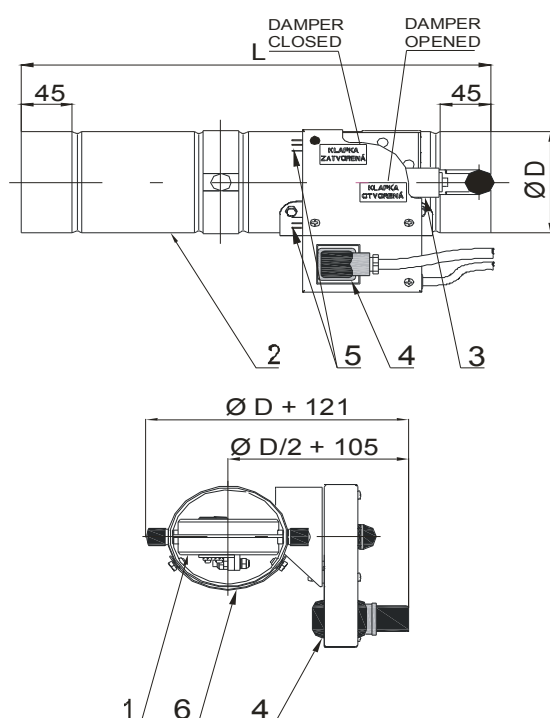
PK-I-EI90S-ZV  
For Dimensions Ø100mm to Ø1000mm  
Certification No: SK01-ZSV-0160  
Test Report No: FIRES-CR-003-08-NURE

**EI 90 (v<sub>e</sub> h<sub>o</sub> i↔o) S**

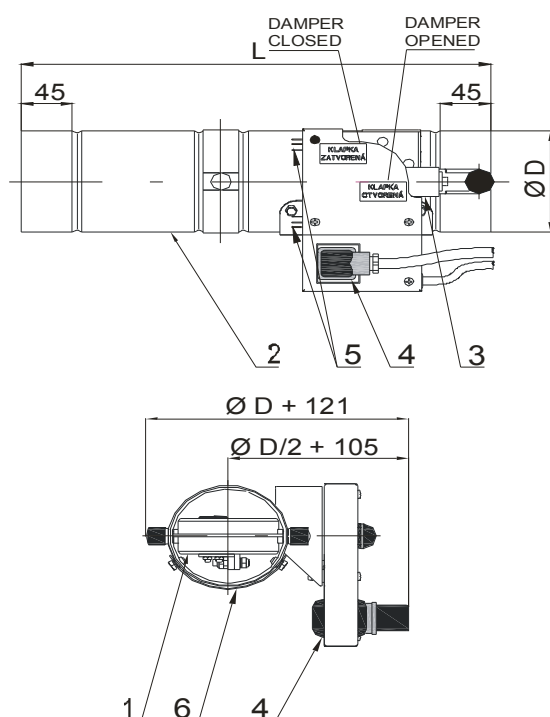
PK-I-EI120S-ZV  
For Dimensions Ø200mm to Ø1000mm  
Certification No: SK01-ZSV-0161  
Test Report No: FIRES-CR-005-08-NURE

**EI 120 (v<sub>e</sub> h<sub>o</sub> i↔o) S**

## Circular Fire Dampers



Manual operated fire damper construction for sizes Ø100 to Ø315 mm



Manual operated fire damper construction for sizes Ø315 to Ø1000 mm

### Damper Codes and Types

**ZV**; Basic model with manual operating lever with spring return release driven by a fusible thermal link set at 72°C.

#### Optional extras:

**DV1**; Closed position indication with 24V contact switch

**DV1-2**; Open and Closed position indication with 24V contact switches

**DV2**; Closed position indication with 230V contact switch

**DV2-2**; Open and Closed position indication with 230V contact switches

**DV3**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity)

**DV4**; Electromagnetic release mechanism 230V. (Release on cut-off of electricity)

**DV5**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 24V End-switch indicating damper Closed position

**DV5-2**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 24V End and Begin-switches indicating damper Closed and Open position

**DV6**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 230V End-switch indicating damper Closed position

**DV6-2**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 230V End and Begin-switches indicating damper Closed and Open position

#### Manual operated Round fire dampers

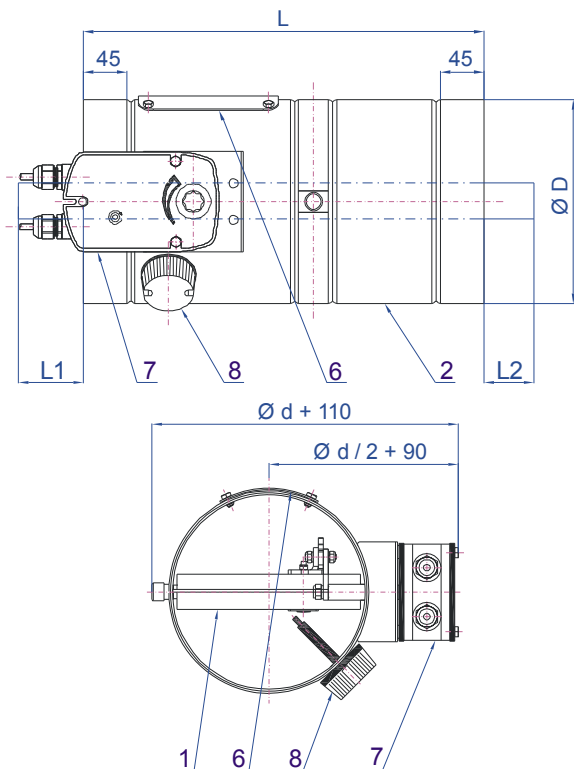
Diameter Ø d [mm]	Length L [mm]	Leaf interference L1 [mm]	Leaf interference L2 [mm]	Weight Q [kg]
100	460	-	-	3,6
125		-	-	4,0
160		-	-	4,8
180		-	-	5,2
200	460	-	-	5,6
225		-	-	6,5
250		-	-	7,0
280		-	-	8,4
315	460	-	-	9,4
355		-	5	10,6
400	500	-	27,5	12,8
450		-	52,5	15,5
500		-	77,5	17,9
560		-	107,5	20,4
630	570	-	142,5	23,7
710		22,5	182,5	27,6
800		67,5	227,5	33,8
900		47,5	277,5	39,8
1000		97,5	327,5	46,6

L1 – Extension of damper blade outside of the casing in full open position

L2 – Extension of damper blade outside of the casing in full open position

## Circular Fire Dampers

### Circular fire damper with actuator



#### Damper parts description:

1. Damper blade
2. casing
3. release mechanism (for manufactures ZV and DV1-DV6)
4. electromagnet (for manufactures DV3-DV6)
5. terminal switch (for manufactures DV1,2,5,6) / two terminal switch (for manufactures DV1-2, 2-2, 5-2, 6-2)
6. inspection (control) lid
7. actuator (for manufactures DV7, DV9-T and DV9-T-ST)
- thermo-electrical release device (for manufactures DV7, DV9-T and DV9-T-ST)

### Actuator driven Fire Dampers:

**DV7;** Spring return actuator driven fire damper (230V) complete with Thermal release mechanism and Auxiliary Switches

**DV9-T;** Spring return actuator driven fire damper (24V) complete with Thermal release mechanism and Auxiliary Switches

**DV9-T-ST;** Spring return actuator driven fire damper (24V) complete with Thermal release mechanism, Auxiliary Switches and Belimo BKN230-24 communication unit  
Electrical accessories

**BKS1** - Communication and control unit BKS24-1B with plug socket ZSO-11 for one remotely controlled fire damper (for DV9-T-ST only)

**BKS9** - Communication and control unit BKS24-9A for up to nine remotely controlled fire dampers (for DV9-T-ST only)

### Main dimensions:

Diameter Ø d [mm]	Length L [mm]	Damper Blade extension L1 [mm]	Damper Blade extension L2 [mm]	Weight Q [kg]
100	400	-	-	4
125		-	-	4
160		-	-	5
180		-	-	5
200		-	-	6
225	450	-	-	7
250		-	-	7
280		-	-	8
315		-	-	9
355		-	5	11
400	500	-	28	13
450		-	53	16
500		-	78	19
560		-	108	22
630		-	143	25
710		23	183	29
800		68	228	35
900		118	278	41
1000		168	328	48

Tab. 1a Round dampers with actuator

L1 – Extension of damper blade outside of the casing in full open position  
L2 – Extension of damper blade outside of the casing in full open position

### Ordering codes:

Fire resistance class	60S, 90S and 120S	PK-I-R-EI
Dimension	ØD	
Operation type	Manual reset lever	ZV
	Switches & Actuators	DV1 to DV9-T-ST
Connection types	Standard	0
	Rubber gaskets	NT
	Mounting flanges	P
Control	BKS1	
Accessories	Communication & Control Units	BKS9
Installation accessories	PR	

#### NOTE:

E = Casing integrity, I = Insulation class, S = Smoke leakage

## Square Fire Dampers



### PK-I-S-EI90S and -EI120S

Systemair Fire dampers are manufactured to comply with latest European Standards. With wide product range and sizes for 90 and 120 minute resistance for square or rectangular ducting.

All dampers as standard are designed and certified for EI-S performance conformity.

PK-I-S fire damper units are designed to be imbedded into the fire partition walls. Installation of these units are clearly indicated on pages 10-12.

All units as standard are available with manual rearmament lever and Actuator driven with optional accessories such as micro-switches, Electromagnets and communication controller units.

### Fire Dampers with manual rearmament lever

Fire Damper is set to closed position when thermal-fuse link is ruptured or a signal is given to the Electromagnet to release the damper blade from open to closed position.

After closure, the damper blade is secured in closed position mechanically and can only be opened manually.

Fusible link manufactured and secured in position with a Bi-metal solution which is designed to release the link mechanism when the air temperatures in the duct system reach 72 °C with tolerance  $\pm 1,5$  °C for the period of 30 to 60 seconds.

Electromagnet maintains the damper blade in open position by maintaining the current through its mechanism. Upon shut-off electrical current, the Electromagnet automatically releases the damper blade mechanism and then the closed or safe position is reached. The damper blade can only be placed in operation by manually releasing the mechanism from the closed position and enabling the current through the electromagnet to hold the damper blade mechanism in open position.

### Actuator driven fire dampers

Fire damper can be equipped with actuator that closes the damper blade on demand of Building Management System or signal received from electro-thermal fuse. As standard all actuator fitted fire dampers are equipped with electro-thermal fuse, which when reaching or exceeds ambient temperature of 72 °C with tolerance  $\pm 1,5$  °C, releases actuator and closes the damper blade to safe position within 60 seconds.

**Square fire dampers are conformed to EN 1366-2 and are classified as in accordance to EN13501-3:2005:**

PK-I-S-EI90S-ZV

For Dimensions 200 x 200mm to 1600 x 1000mm

Certification No: SK01-ZSV-0118

Test Report No: FIRES-CR-202-07-NURE

**EI 90 (v<sub>e</sub> h<sub>o</sub> i↔o) S**

PK-I-S-EI120S-ZV

For Dimensions 200 x 200mm to 1600 x 1000mm

Certification No: SK01-ZSV-0157

Test Report No: FIRES-CR-219-07-NURE

**EI 120 (v<sub>e</sub> h<sub>o</sub> i↔o) S**



## Square Fire Dampers

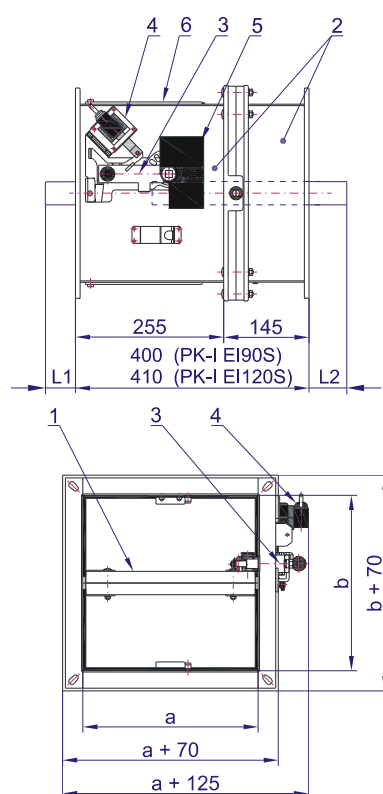


Fig. 2 Square damper without actuator

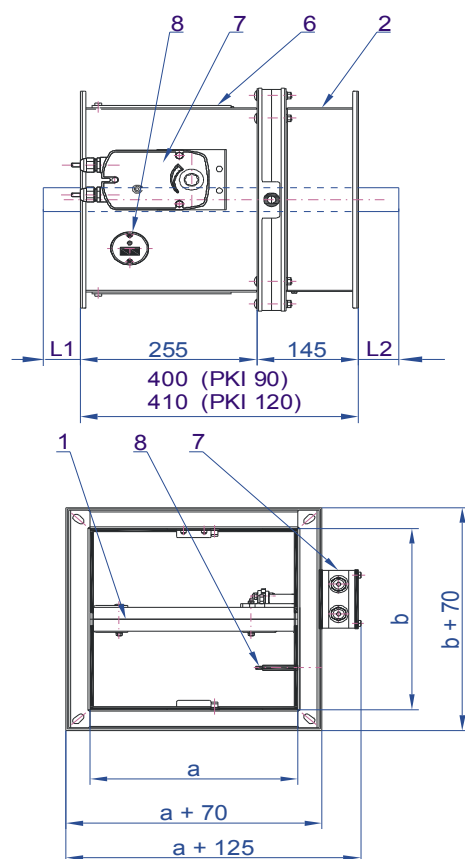


Fig. 2 Square damper with actuator

### Damper Codes and Types

**DV**; Basic model with manual operating lever with spring return release driven by a fusible thermal link set at 72°C.

#### Optional extras:

**DV1**; Closed position indication with 24V contact switch

**DV1-2**; Open and Closed position indication with 24V contact switches

**DV2**; Closed position indication with 230V contact switch

**DV2-2**; Open and Closed position indication with 230V contact switches

**DV3**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity)

**DV4**; Electromagnetic release mechanism 230V. (Release on cut-off of electricity)

**DV5**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 24V End-switch indicating damper Closed position

**DV5-2**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 24V End and Begin-switches indicating damper Closed and Open position

**DV6**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 230V End-switch indicating damper Closed position

**DV6-2**; Electromagnetic release mechanism 24V. (Release on cut-off of electricity) plus 230V End and Begin-switches indicating damper Closed and Open position

### Actuator driven Fire Dampers:

**DV7**; Spring return actuator driven fire damper (230V) complete with Thermal release mechanism and Auxiliary Switches

**DV9-T**; Spring return actuator driven fire damper (24V) complete with Thermal release mechanism and Auxiliary Switches

**DV9-T-ST**; Spring return actuator driven fire damper (24V) complete with Thermal release mechanism, Auxiliary Switches and Belimo BKN230-24 communication unit

**BKS1** - Communication and control unit BKS24-1B with plug socket ZSO-11 for one remotely controlled fire damper (for DV9-T-ST only)

**BKS9** - Communication and control unit BKS24-9A for up to nine remotely controlled fire dampers (for DV9-T-ST only)

## Square Fire Dampers

### Unit weight (Kg)

H/ L	200	300	350	400	450	500	550	600	700	800	900	1000	1100	1200	1400	1500	1600
200	8.2	9.6	11.3	12.1	12.9	13.7	14.7	15.9	17,2	18,7	20,4	22,1	24,1	26,2	28,7	30,4	32,0
250	8.8	10.4	12.4	13.2	14.2	15.1	16.2	17.5	19,0	20,6	22,5	24,3	26,5	28,9	31,7	33,6	35,4
300	9.6	13	13.9	14.8	15.8	16.9	18.1	19.6	21,2	23,1	25,2	27,3	29,8	32,5	35,6	37,7	39,8
350	11.3	13.9	14.8	15.8	16.9	18	19.3	20.9	22,6	24,7	26,9	29,1	31,8	34,7	38,0	40,2	42,4
400	12.1	14.8	15.8	16.8	18	19.2	20.6	22.3	24,2	26,4	28,8	31,1	34,0	37,1	40,7	43,1	45,5
450	12.9	15.8	16.9	18	19.3	20.6	22.1	23.9	26,0	28,3	30,9	33,4	36,5	39,8	43,7	46,2	48,8
500	13.7	16.9	18	19.2	20.6	22	23.6	25.5	27,7	30,2	32,9	35,7	39,0	42,6	46,7	49,4	52,2
550	15.9	18.1	19.3	20.6	22.1	23.6	25.4	27.5	29,8	32,5	35,5	38,4	42,0	45,8	50,3	53,2	56,2
600	17.2	19.6	20.9	22.3	23.9	25.5	27.5	29.7	32,3	35,2	38,4	41,6	45,5	49,6	54,5	57,7	60,9
700	18.7	21.2	22.6	24.2	26	27.7	29.8	32.3	35,1	38,2	41,7	45,2	49,4	54,0	59,2	62,7	66,2
800	20.4	23.1	24.7	26.4	28.3	30.2	32.3	35.2	38,2	41,7	45,5	49,3	53,9	58,9	64,6	68,5	72,3
900	22.1	25.2	26.9	28.8	30.9	32.9	35.5	38.4	41,7	45,5	49,7	53,9	58,9	64,3	70,6	74,8	79,0
1000	22.1	27.3	29.1	31.1	33.4	35.7	38.4	41.6	45,2	49,3	53,9	58,4	63,9	69,8	76,6	81,2	85,7

### Ordering codes:

		<b>PK-I-S-EI</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire resistance class		90S and 120S						
Dimension		L x H						
Operation type	Manual reset lever	ZV						
	Switches & Actuators	DV1 to DV9-T-ST						
Connection type	Standard	0						
	Rubber gaskets	NT						
	Mounting flanges	P						
Control		BKS1						
Accessories	Communication & Control units	BKS9						
Installation accessories		PR						

### NOTE:

E = integrity

I = insulation

S = smoke leakage

## Installation of Round Fire Dampers

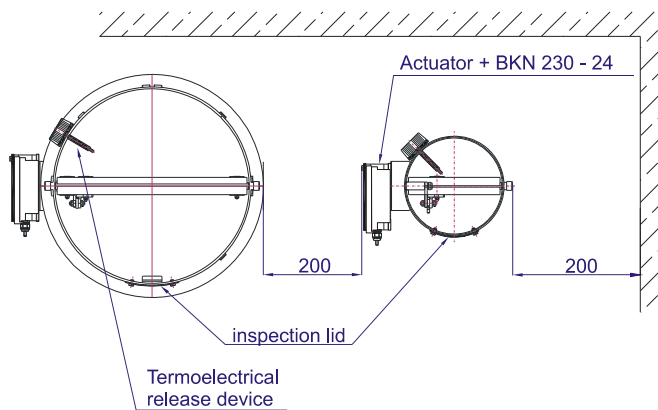
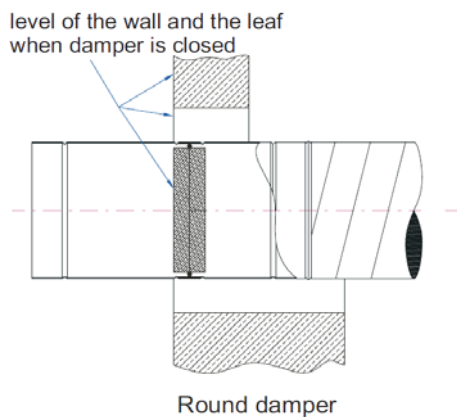


Fig. 5 Spacing between the dampers



Round damper

Fig. 6 Correct position of closed damper blade

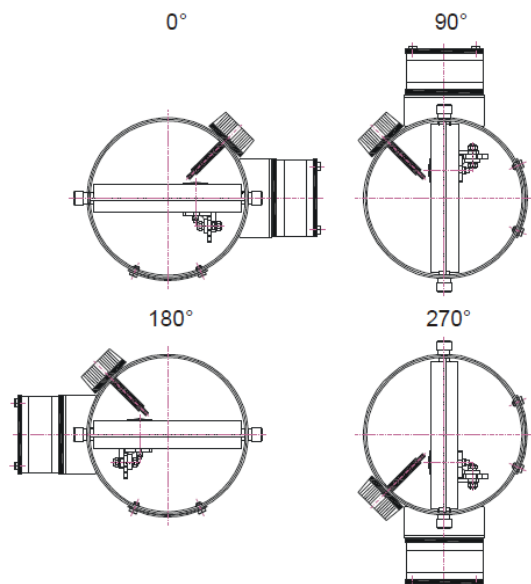


Fig. 4 Allowable damper blade position

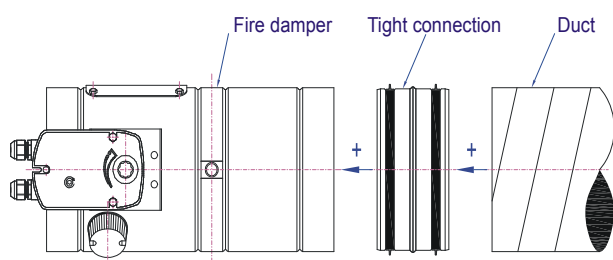


Fig. 3a Connecting a damper of round cross-section with air tight connection joint, Code NT

### Fire damper placement and clearances

Damper release mechanism or actuator can be located on any side of the wall or ceiling.

However it must be positioned in such way that there is easy access provided for inspection or service.

Examples of damper locating can be seen in fig. 7.

Spacing between the fire dampers must be a minimum of 200 mm. At mechanical manufacture must be on the side where mechanism is situated free space the side where of min. 500 mm left.

Fire damper is embedded into fire partition construction in such way that when the damper blade is in closed position, the blade will be situated within the wall (fig. 8).

Damper can be embedded in the wall or in the ceiling with min. thickness of  $110 \pm 10$  mm according to STN EN 1366-2.

All connecting ducts to the fire damper must be supported or suspended in such way that the duct weight would not lean on damper or damper flanges. Further more the damper should not bare any weight from the above or surrounding construction of the wall, this can result in distortion of the casing and ultimately malfunction of the fire damper.

All dampers are designed to be installed with damper blade in parallel  $0^\circ$  to horizontal position or  $0^\circ$  in vertical position. Any other angle will compromise the integrity and function of the fire damper.

**Note:** After installation, Fire damper functionality must be tested (see operating manual).

### Available Duct connections

Round fire dampers are provided as standard without any rubber gaskets or flanges.

Accessories such as air tight joint connection (**Code NT**, Fig 3a), and-or pre-drilled flanges (**Code P**, Fig 3b) can be provided separately on demand

Accessories are supplied non mounted and separately to be mounted on site by others.

**Note:** During the installation of the Flanges, proper sealant and gasket must be used to avoid any leakages at the duct connection.

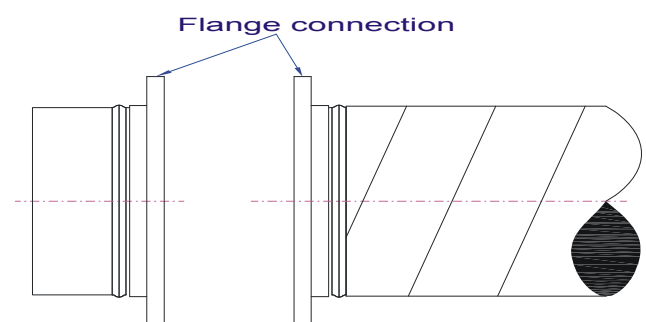


Fig. 3b Round fire dampers with Flanged connection Code P



## Installation of Round fire dampers

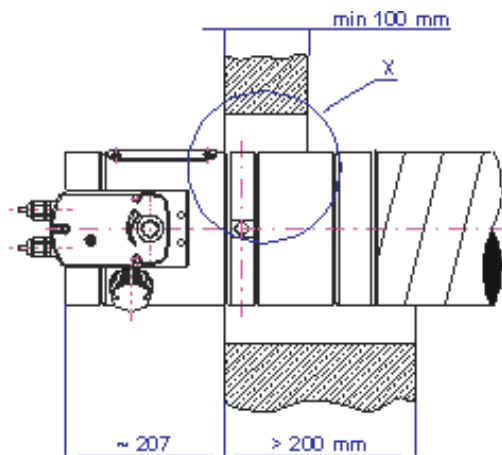


Fig. 7, Damper blade positioning into the partition wall

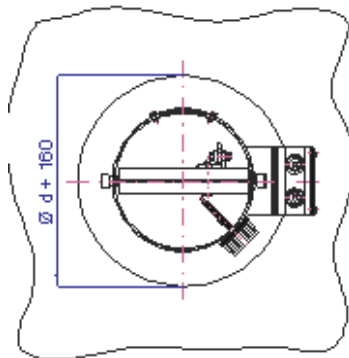


Fig. 8, Round fire damper imbedded into the wall with intumescent gypsum mixture.

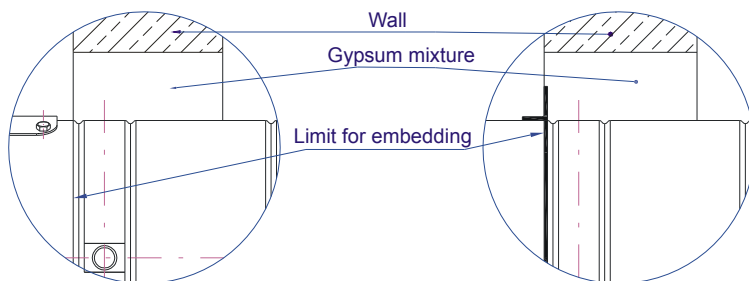


Fig. 8a, Detail X  
for dampers < Ø 400 mm

Fig. 8b, Detail X  
for dampers ≥ Ø 400 mm

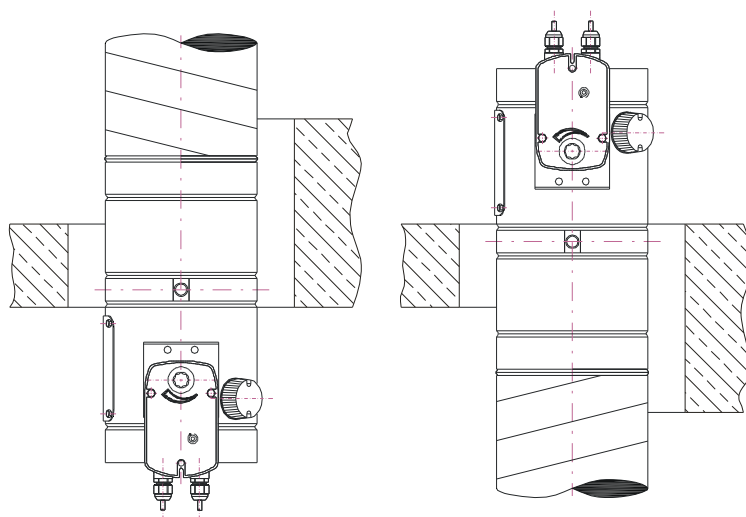


Fig. 9, Imbedding round fire damper in the ceiling with intumescent gypsum

### **Building in the PK-I-R in the wall, with gypsum mixture**

An intumescent gypsum mixture can be used to seal the opening section between the wall and the fire damper.

The entire wall cross-section must be perfectly filled with gypsum mixture

The opening provided for this installation should be no less than  $\text{Ø}d + 160 \text{ mm}$ .

Fire damper is embedded into fire partition construction in such way that when the damper blade is in closed position, the blade will be situated within the wall (fig.7).

Damper can be embedded in the wall or in the ceiling with min. thickness of  $110 \pm 10 \text{ mm}$  according to STN EN 1366-2.

All connecting ducts to the fire damper must be supported or suspended in such way that the duct weight would not lean on damper or damper flanges. Further more the damper should not bare any weight from the above or surrounding construction of the wall, this can result in distortion of the casing and ultimately malfunction of the fire damper.

Limit of damper embedding into the wall, or the ceiling is stated by marking made on the fire damper casing from the mechanism or actuator side (see detail X - fig. 8 and fig. 8a).

For all fire dampers which are equal or larger than size  $\geq \text{Ø} 400 \text{ mm}$ , the fire damper casing has an built-in reinforcement at the limit of fire damper embedment for extra support (see fig. 8b).

Fire damper is embedded into fire partition Floor or Ceiling in such way that when the damper blade is in closed position, the blade will be situated within the wall (fig.9).

Damper can be embedded in the wall or in the ceiling with min. thickness of  $110 \pm 10 \text{ mm}$  according to STN EN 1366-2.

All connecting ducts to the fire damper must be supported or suspended in such way that the duct weight would not lean on damper or damper flanges. Further more the damper should not bare any weight from the above or surrounding construction of the wall, this can result in distortion of the casing and ultimately malfunction of the fire damper.

## Installation of Round fire dampers

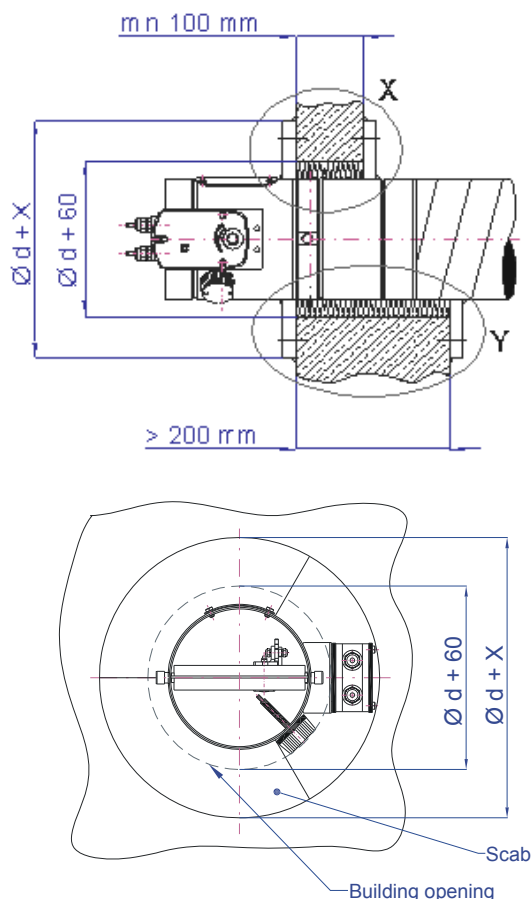


Fig. 9a Building opening and covers for round dampers

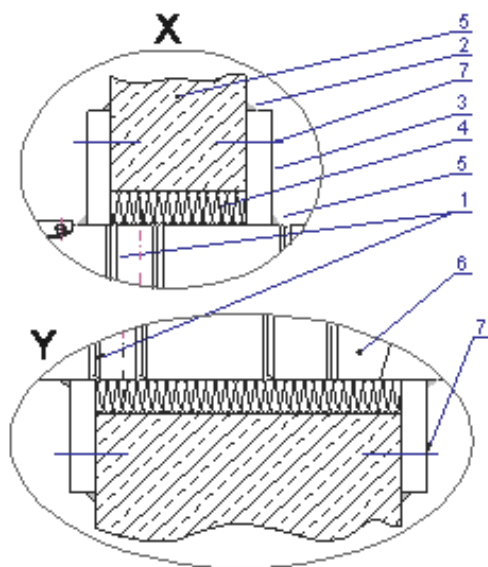


Fig. 9 Imbedding the round fire damper into the wall and fastening in place with Rockwool and finishing with cover plates

1. Partition level of Fire damper limit for imbedding
2. Partition Fire wall
3. Cover plates (with pre-drilled openings)
4. Rockwool of minimum 80 kg/m<sup>3</sup>
5. Fire resistance mastic
6. Duct connection
7. Screws and metal anchors in necessary size and type in respect to wall construction type.

### Installation of PK-I-R into the wall using Rockwool

To seal between the wall and the fire damper Rockwool with a min. density of 80-100 kg/m<sup>3</sup> can be used. Once the fire damper is properly secured into the wall, cover plates made of calcium-silicate can be used to close or finish the wall openings (fig. 12).

Cover plates are not a part of fire damper and are delivered as damper accessories, which must be indicated and specified at the order.

Cover plates are fire resistant mastic Intumex MA.

From one side of the wall cover plates are mounted together with the damper to the wall opening.

The entire opening between the fire damper and the wall in the full depth of the wall around the fire damper must be filled perfectly with Rockwool of Density 80-100 kg/m<sup>3</sup>.

Once the above two procedures are fulfilled, then after the opening from the other side of the wall can be closed with cover plates to secure and finish the installation.

A minimum opening diameter of Ød + 60 mm is required for each size of fire damper for it to be properly imbedded into wall cross section. Outer diameter of cover plates for closure are normally Ød + X as standard (see fig. 12a).

Metal anchors are used to fasten the cover plates to the wall or ceiling made of concrete, bricks or building blocks. All anchors should have a minimum length of 70 mm and to accommodate a screw diameter no less than 5 mm.

After the installation is completed, the damper's operation must be tested (see operating manual).

X= 200 mm for dimensions PK-I-R/ Ø100 to Ø 560 mm  
X= 300 mm for dimensions PK-I-R/ Ø630 to Ø 1000 mm

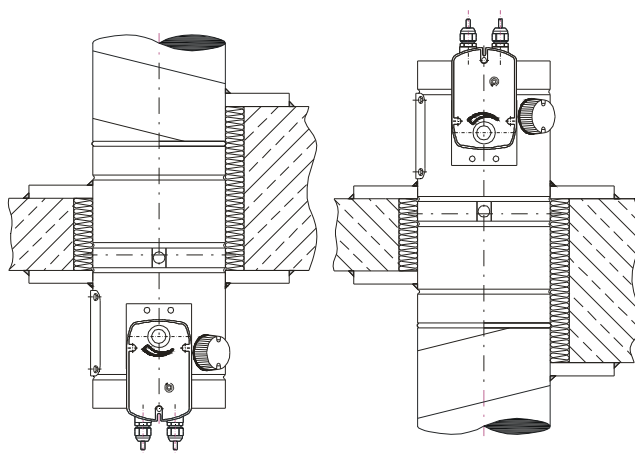


Fig. 10 Imbedding the round fire damper in the ceiling with Rockwool

## Pressure loss calculation for square dampers types:

- PK-I-R-EI60S
- PK-I-R-EI90S
- PK-I-R-EI120S

Damper pressure losses are stated by the calculation. Coefficients of local pressure losses, which refer to nominal cross - section referred to  $\varnothing d$  are stated in the tables. Pressure loss for exact damper is stated by calculation according to the scheme:

$$p_z = \xi v_L^2 \cdot \frac{\rho}{2}$$

$p_z$  – pressure loss

$\xi$  – resistance coefficient

$v_L^2$  – flow velocity in cross-section referring to  $\varnothing d$  [ $m \cdot s^{-1}$ ]

$\rho$  – air density [ $kg \cdot m^{-3}$ ] (1,23  $kg \cdot m^{-3}$ )

$\varnothing d$ (mm)	100	125	160	180	200	225	250	280	315	355
$\xi$	4,1	4	3,5	2,8	1,57	1,4	1,33	1,19	1,09	0,98
$\varnothing d$ (mm)	400	450	500	560	630	710	800	900	1000	
$\xi$	0,88	0,79	0,7	0,62	0,54	0,47	0,4	0,34	0,3	

Tab. 2 Resistance coefficient for round dampers

## Installation of Square Fire Dampers

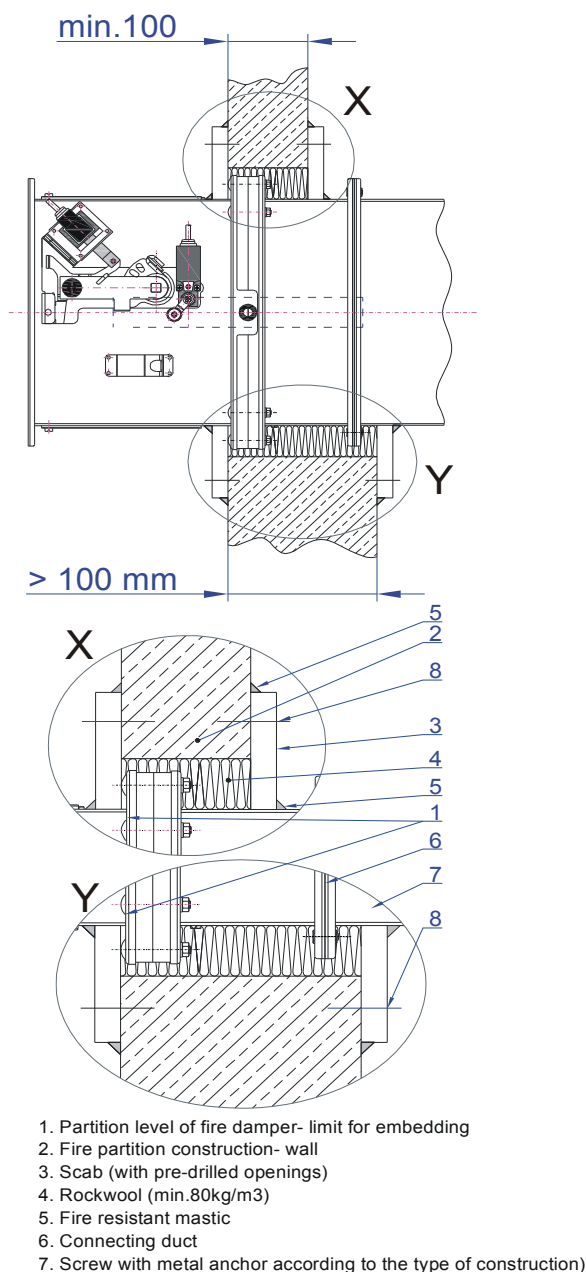


Fig. 13 Built in of square damper into building opening with help of Rockwool and scabs

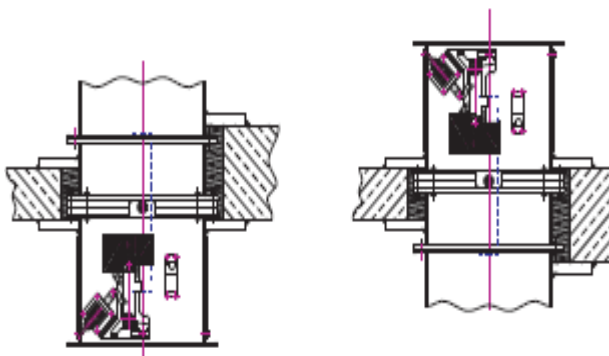


Fig. 14 Imbedding square fire damper in the ceiling with Rockwool

### Installation of Square fire dampers PK-I-S-EI90S and 120S into the wall

To seal between the wall and the fire damper Rockwool with a min. density of  $80\text{--}100\text{ kg/m}^3$  can be used. Once the fire damper is properly secured into the wall, cover plates made of calcium-silicate can be used to close or finish the wall openings (fig. 12).

Cover plates are not a part of fire damper and are delivered as damper accessories, which must be indicated and specified at the order.

Cover plates are fire resistant mastic Intumex MA.

From one side of the wall cover plates are mounted together with the damper to the wall opening.

The entire opening between the fire damper and the wall in the full depth of the wall around the fire damper must be filled perfectly with Rockwool of Density  $80\text{--}100\text{ kg/m}^3$ .

Once the above two procedures are fulfilled, then after the opening from the other side of the wall can be closed with cover plates to secure and finish the installation.

A minimum opening diameter of  $\text{Ød} + 60\text{ mm}$  is required for each size of fire damper for it to be properly imbedded into wall cross section. Outer diameter of cover plates for closure are normally  $\text{Ød} + X$  as standard (see fig. 12a).

Metal anchors are used to fasten the cover plates to the wall or ceiling made of concrete, bricks or building blocks. All anchors should have a minimum length of  $70\text{ mm}$  and to accommodate a screw diameter no less than  $5\text{ mm}$ .

After the installation is completed, the damper's operation must be tested (see operating manual).

$X = 200\text{ mm}$  for dimensions PK-I-R/  $\text{Ø}100$  to  $\text{Ø}560\text{ mm}$   
 $X = 300\text{ mm}$  for dimensions PK-I-R/  $\text{Ø}630$  to  $\text{Ø}1000\text{ mm}$

Outer diameter of scabs is stated by the ratio  $\text{Ød} + X$  (see fig. 12a).

For suspending the scabs to the wall or ceiling are used metal anchors for given building construction (concrete, bricks, porous concrete, etc.) with the depth of screw in min.  $70\text{ mm}$  and with screw diameter for min.  $5\text{ mm}$ .

## Installation of Square Fire Dampers

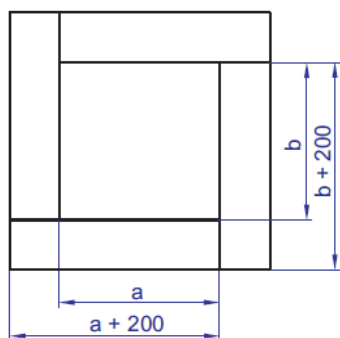


Fig. 13a Size of the covers

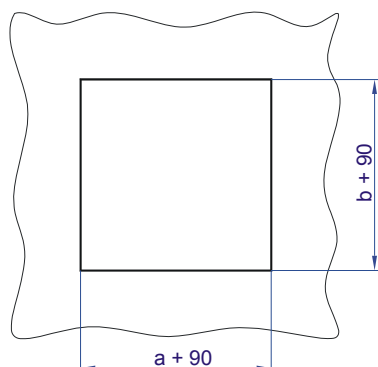


Fig. 13b Building opening

$\xi$	b [mm]											
	200	250	315	355	400	450	500	560	630	710	800	1000
a [mm]	200	1,39										
	250	1,31	1,19									
	315	1,24	1,14	0,99								
	355	1,2	1,12	0,97	0,91							
	400	1,16	1,08	0,94	0,88	0,82						
	450		1,05	0,92	0,86	0,8	0,74					
	500		1,02	0,89	0,83	0,78	0,72	0,68				
	560			0,85	0,8	0,76	0,7	0,66	0,61			
	630			0,82	0,77	0,73	0,67	0,64	0,6	0,54		
	710				0,73	0,7	0,65	0,62	0,58	0,53	0,49	
	800					0,66	0,61	0,59	0,56	0,51	0,47	0,44
	900						0,56	0,57	0,54	0,49	0,45	0,42
	1000							0,54	0,52	0,47	0,43	0,4
	1120								0,49	0,45	0,42	0,38
	1250									0,43	0,41	0,36
	1400										0,4	0,34
	1500										0,39	0,32
	1600										0,38	0,29
												0,27

Tab. 3 Resistance coefficient for square dampers

### Installation Opening and Covers:

Opening dimension and clearance required for Square dampers to be imbedded into the wall is noted her on Figures 13 a & 13b

Covers are available if needed on site as optional extra to secure and close the opening insulation between the wall and the fire dampers.

Covers are manufactured from refractive material similar to fire dampers to secure the integrity of the installation and fire barrier rating.

### Pressure loss calculation for square dampers types:

- PK-I-S-EI90S
- PK-I-S-EI 120S

Damper pressure losses are stated by the calculation. Coefficients of local pressure losses, which refer to nominal damper cross- section a x b or cross - section referred to  $\phi d$  are stated in the tables. Pressure loss for exact damper is stated by calculation according to the scheme:

$$p_z = \xi v_L^2 \cdot \frac{\rho}{2}$$

$p_z$  – pressure loss

$\xi$  – resistance coefficient

$v_L^2$  – flow velocity in nominal cross-section a x b or cross-section referring to  $\phi d$  [m . s<sup>-1</sup>]

$\rho$  – air density [kg.m<sup>-3</sup>] (1,23 kg . m<sup>-3</sup>)

## Operations & Maintenance of fire dampers

### Putting the damper into operation

#### *Dampers in standard manufacture- ZV and with additional equipment- DV1÷DV6*

##### Mechanical triggering

By pulling the securing pivot (2) we lock-off the adjusting lever of the mechanism (1) and we move it from the CLOSED position to OPEN position. When turning the adjusting lever (1) it is simultaneously tensing also the return-spring (10) that is why it is needed to use only light power to tense the spring. Securing pivot (2) must easily fit into securing mechanism (3) of actuating lever (4).

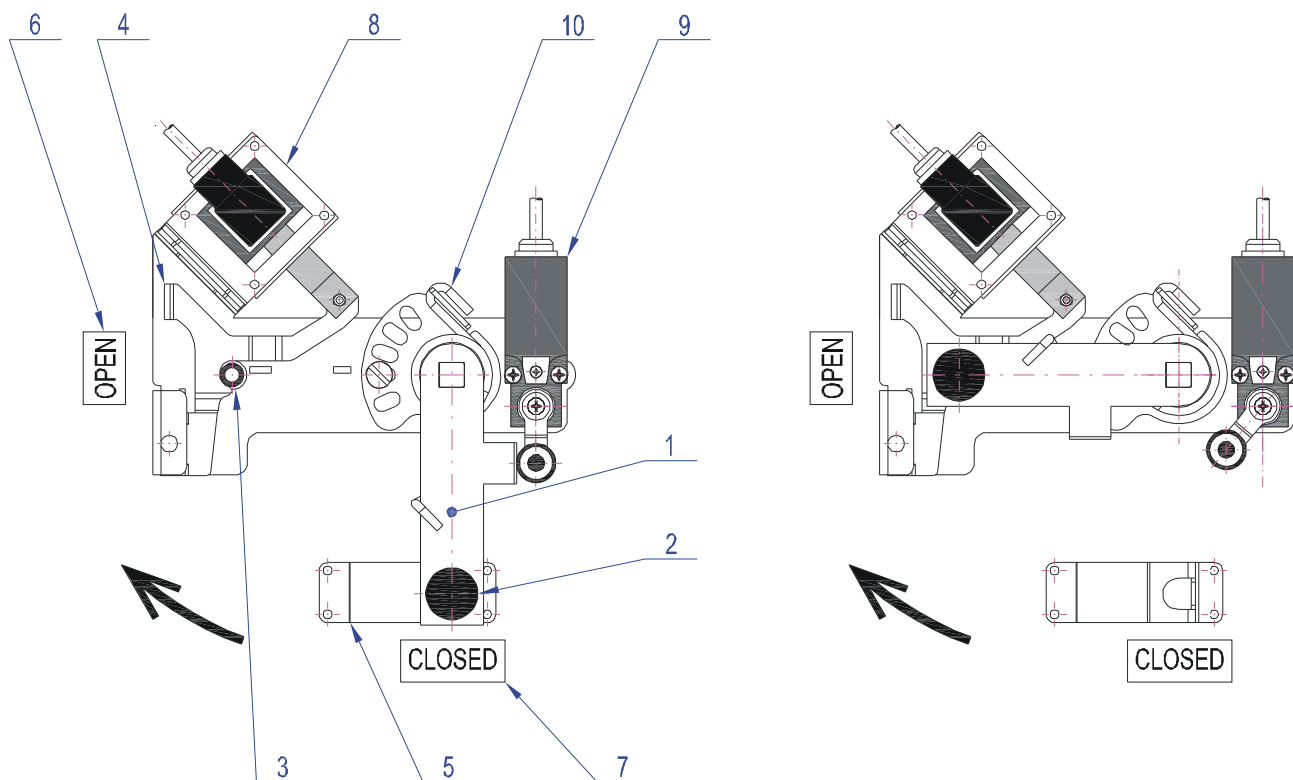


Fig. 36 Putting the damper with mechanical regulation into operation

##### Wiring the electrical accessories

If a damper is equipped with electromagnet (8) or terminal switch (9) it is necessary to connect these devices to el. power according to the wiring schemes.

##### Damper mechanical function check

After putting the damper into operation (leaf opening) it is necessary to check damper function. By pulling the actuating lever (4) we release securing sack (3) and adjusting lever (1) moves from OPEN position to CLOSED position. Closing the damper is provided by return-spring (10). Securing pivot (2) fits into holder (5) and by that is the damper leaf secured against opening. After actuating the damper immediately closes. Process of closing must be fluent without the adjusting lever (1) stopping in any other position as CLOSED. If the damper is in manufacture with terminal switch (9), by actuating the mechanism must the terminal switch (9) signal leaf closing.

By mechanical function damper check, please pull the actuating lever (4) with finger and pull your hand back from the damper, so that it will not get injured by the adjusting lever!



## Operations & Maintenance of fire dampers

### Damper electrical function check

If the damper is in manufacture DV1÷DV6 with electromagnet it is necessary to test the mechanism function also with electromagnet. Electromagnet receives the signal for actuating (for example from the central building system) releases the actuating lever (4) and mechanism closes. Adjusting lever (1) immediately moves from position OPEN to position CLOSED. If the damper is in manufacture with terminal switch (9) it must signal closing the leaf after actuating the mechanism.

***Dampers in basic version ZV and with additional manufacture DV1 ÷ DV6 (valid only for PK-I-R to diameter 200 mm including)***

### Mechanical triggering

By pulling of securing part (2) we lock-off the adjusting lever of the mechanism (1) and we move it from the CLOSED position to OPEN position. When turning the adjusting lever (1) it is simultaneously tensing also the return-spring, that is why it is needed to use light power to tense the spring. Securing part must easily fit into securing mechanism.

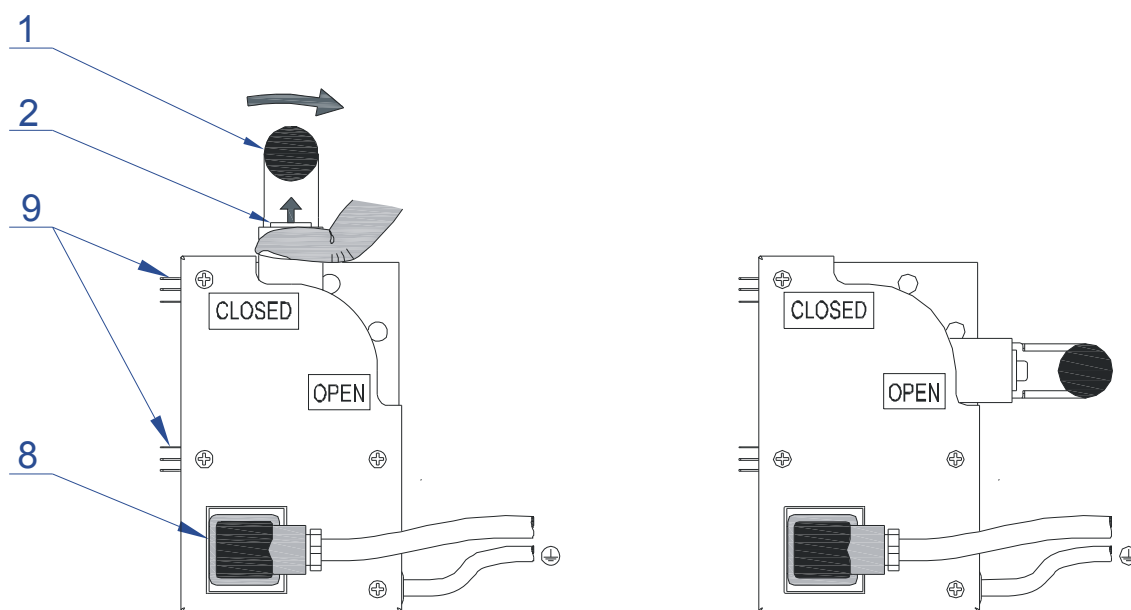


Fig. 36b Putting the damper with mechanical regulation into operation

### Wiring the electrical accessories

If a damper is equipped with electromagnet (8) or terminal switch (9) it is necessary to connect these devices to el. power according to the wiring schemes.

### Damper mechanical function check after putting it into operation

After putting the damper into operation (leaf opening) it is necessary to check damper function. By pulling the securing part (2) adjusting lever releases (1) and moves from OPEN position to CLOSED position. Closing the damper is provided by return-spring. Securing part (2) fits into holder and by that is the damper leaf secured against opening. After actuating the damper immediately closes and the process of closing must be fluent without the adjusting lever (1) stopping in any other position as CLOSED. If the damper is in manufacture with terminal switch (9), by actuating the mechanism must the terminal switch (9) signal leaf closing.

By mechanical function damper check, please pull the actuating lever (4) with finger and pull your hand back from the damper, so that it will not get injured by the main lever!

## Operations & Maintenance of fire dampers

### Damper el. function check

If the damper is in manufacture DV3+DV6 with electromagnet it is necessary to test the mechanism function also with electromagnet. Electromagnet receives the signal for actuating (for example from the central building system) releases the actuating lever (4) and mechanism closes. Adjusting lever (1) immediately moves from position OPEN to position CLOSED. If the damper is in manufacture with terminal switch (9) it must signal closing the leaf after actuating the mechanism

### **Dampers with actuator in manufactures DV7, DV9-T and DV9-T-ST**

#### Putting damper into operation

After connecting the actuator to el. power (see wiring schemes according to damper manufacture) the electromotor is activated and puts the damper into operation position. That means that the damper leaf opens. Control system, which the damper is connected to signals (according to damper connection) open or closed position of damper leaf.

#### Damper function check

Damper function is checked when we press and hold the switch on thermo electrical release device (heat fuse) as shown in fig. 37. With the switch we simulate failure of heat fuse. It is necessary to hold the switch in ON mode during the whole damper function check. Actuator puts the damper into accident position- it closes the damper leaf with the energy of return spring of the actuator. Damper should close within app. 20-30 seconds (depends on operation temperature). Position of the leaf is possible to check visually through inspection lid or the leaf position is signaled by control system which the damper is connected to.

Damper must close also at any electricity supply drop out when the damper leaf is closed with energy of actuator's return spring.



*Fig. 37 Thermo electrical release device*

#### Visual check

After putting the damper into operation mode it is necessary for all the damper types to demount the inspection lid and check the damper leaf position and also check possible visible damper leaf and other damper parts damages visually. Visual check is needed for both leaf positions - OPEN / CLOSED.

## **Operation, check and maintenance**

### Operation conditions

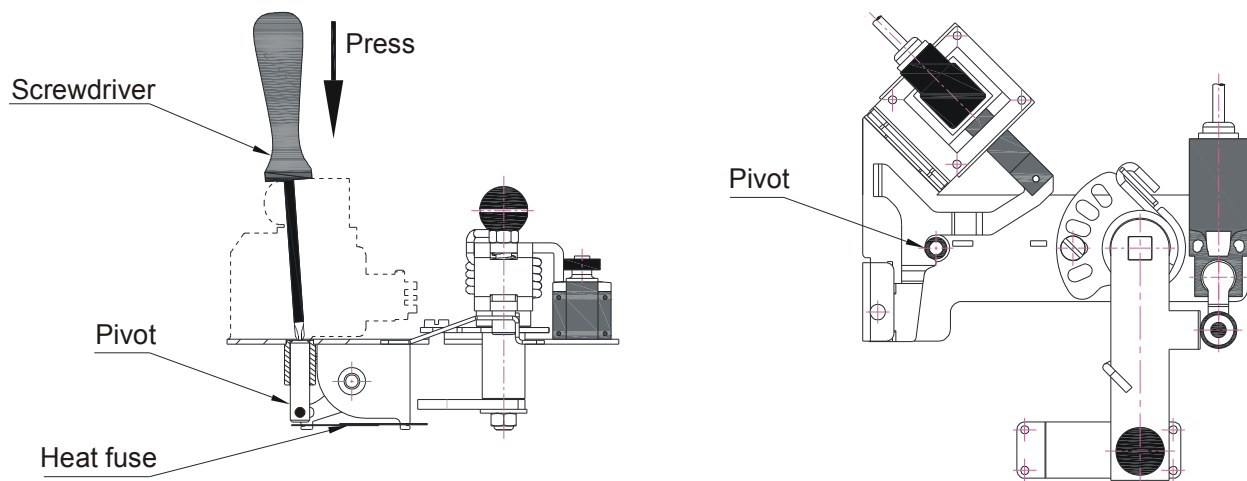
Operator keeps fire dampers in operation and in safe status during their whole period of service according to operation manual published by the producer. It is not allowed to do any changes or modifications on the dampers and any damper parts cannot be removed without producer's permission. Operator provides regular checking of the dampers according to valid instructions and norms given by the country. If not stated in other way, operator does the damper check once per 12 months. Damper checking is provided by skilled person. Fire damper status determined during the check is noted into operation diary with the date of the check, name and last name in bold and signature of the person that has done the check. If any inadequacies were determined it is needed to note also proposal for their elimination into the operation diary.

*Fig. 38 Putting the damper with mechanical regulation into operation*

## Operations & Maintenance of fire dampers

### Replacement of Fusible Link:

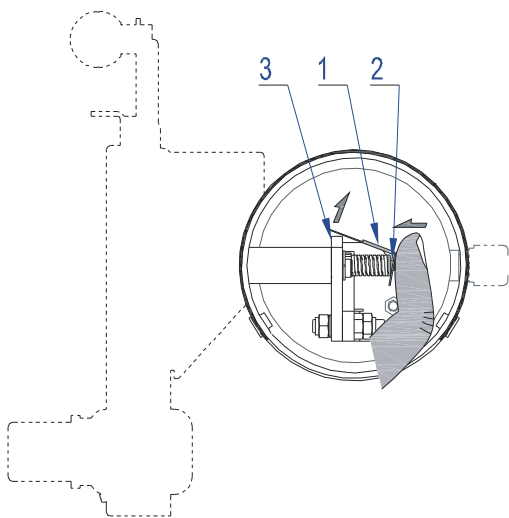
Heat fuse is located inside the damper casing. From the design point of view it is a part of the panel with release device. Heat fuse consists of two parts connected with solder made of low- fusible alloy of non-steel metals. In case of any reason it is necessary to exchange the heat fuse it is possible to do it through inspection lid. When exchanging the heat fuse we push the pivot from the top with a cross-head screwdriver according to fig. 39 and we replace the damaged heat fuse through inspection lid. After mounting the next fuse we release the pivot. Then the exchange of the heat fuse is finished. Damaged heat fuse is possible to exchange only with new original fuse supplied by damper producer.



*Fig. 39 Heat fuse replacement*

### Replacement of Fusible link (valid only for PK-I-R to diameter 200 mm including)

Heat fuse is located inside the damper casing. From the design point of view it is a part of the panel with release device. Heat fuse consists of two parts connected with solder made of low- fusible alloy of non-steel metals. In case of any reason it is necessary to exchange the heat fuse it is possible to do it through inspection lid. **Please make the heat fuse replacement only when the damper leaf is closed!** Heat fuse (1) has a round opening on one side, which is put on the end of the rod (2) with spring to this end we push in direction to the lever (3) and we release it from the lever jag according to the fig.39b. The process of mounting is backwards as demounting. After mounting the new heat fuse we release rod and the heat fuse replacement is finished. It is possible to replace damaged heat fuse only with new original fuse delivered by damper producer.



*Fig. 39b Heat fuse replacement (valid only for PK-I-R to diameter 200 mm including)*

## Operations & Maintenance of fire dampers

### Electrical function check

#### Accessory types: DV3 – DV6

Electromagnet receives a signal to trigger (for example, from the central system of the building), releases the release lever (4) and the mechanism closes. Adjusting lever (1) immediately moves from position OPEN to position CLOSED. If the damper is in manufacture with terminal switch (9) it must signal closing of the leaf when the mechanism triggers.

#### Accessory types: DV7, DV9-T / T-ST

Damper function is checked by pushing and holding the switch situated on thermo electrical release device (heat fuse) as shown in fig. 37. Doing this simulate failure of heat fuse. It is necessary to hold the switch in ON mode during the whole damper function check. Actuator puts the damper into accident position- closes the damper leaf with energy of actuator's return spring. Fire damper should close within app. 20 to 30 seconds (depends on operation temperature). Damper leaf position is possible to check also visually through damper inspection lid or position of the damper leaf signals control system which the damper is connected to. Damper must close at any power drop-out while the damper leaf is closed with energy of actuator's return spring.

## Operations & Maintenance of fire dampers

### Operating diary:

Putting the Fire damper into operation		
Date of putting into operation	Text- found faults and defects	Signature and date of control ling technician

Special controls		
Date of control	Text- found faults and defects	Signature and date of control ling technician



**IMOS-Systemair**

**DECLARATION OF CONFORMITY**

No.28/2001/PKI

**Product name and type:**

Fire damper, PKI

**Producer:**

Company name: IMOS-Systemair s. r. o.

Address: Kalinkovo 146

Company Id. Number: 00683868

Address of production: Kalinkovo

**Product description and determination:**

Fire damper is a fire closure of ventilation ducts functioning on the principle that an impulse (e.g. mechanical, thermal or electrical) causes the damper leaf to close the duct and restrain the expansion of fire, heat and smoke.

**Technical specification:**

TPI 28-08, Public Notice of MV SR no. 94/2004 Collection of Law, Public Notice of MH SR no. 515/2001 Collection of Law, STN 73 0872:2003, STN EN 1366-2:2001, STN EN 13501-3:2006, STN EN 61010-1+A2:2000

**Authorized person, who declared the conformity data:**

Company name: FIRES spol. s r. o.

Company address: Osloboditeľov 282, 059 35 Batizovce, Slovakia

Company Id. Number: CIS 01/1998

Certificate:

PKI-H-EIS 90, PKI-D-EIS 90 SK01-ZSV-0118

PKI-H-EIS 120, PKI-D-EIS 120 SK01-ZSV-0157

PKI-D-EIS 60 SK01-ZSV-0159

PKI-D-EIS 90 SK01-ZSV-0160

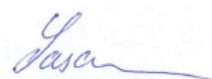
PKI-D-EIS 120 SK01-ZSV-0161

The producer announce in accordance with law of constructional products, that

**product is in conformity**

with stated technical and law instructions. This declaration of conformity is published by the producer on his own responsibility

Kalinkovo 31. 3. 2008



Michal LASAN  
Quality and environment  
manager

**IMOS - Systemair, s.r.o.**

900 43 KALINKOVO 146

IČ DPH: SK2020363290

IČO: 00683868 -2-

Stamp

*This product was made under conditions of integrated quality and environment management, which is in conformity with standard ISO9001:2000 and ISO14001:2004. This system was certificated by BVQI.*

## Warranty

Shipment date: \_\_\_\_\_

\_\_\_\_\_  
Stamp and signature of shipment officer

### Important Notice!

The customer is required to keep the stamped Warranty document. Without this warranty document, no claims for warranty service free of charge are accepted.

### Warranty service:

Date of notification the repair	Date of the carried out repair	Description of performed work	Service officer (stamp and signature)

### Warranty conditions:

1. IMOS-Systemair s.r.o. provides warranty for all produced Fire dampers PKI, the warranty is 24 months from mounting the product and putting it into operation, max. 30 months from the shipment date.
2. The product is tested in the production factory before the shipment. The producer guarantees, that the features of the product shall be according to the related technical standards during the whole warranty period, assuming that the customer uses it in a way stated in operating instructions. If, despite this fact, any unpredictable production defects occur on the product, the producer shall secure their free of charge removal during the warranty period.
3. The customer may apply for the warranty service only in written form and with present properly filled in and stamped warranty document.
4. The warranty does not apply to defects caused by unprofessional handling, incorrect mounting and not following the instructions stated in operation manual.
5. The warranty period shall be prolonged for the same period of time since when the customer lodged the claim for warranty service until the repair is carried out.
6. The repair shall be carried out at user's premises and the producer shall bear costs which are necessarily needed for the repair.
7. In case no defects are found, which the warranty can be applied to the costs for sending a service technician or expert shall be born by the customer, who drew a claim for repair.

### Storage conditions

It is recommended to store the products in closed and dry places in temperature range from -30°C to +50°C.

### Warranty

The manufacturer guarantees the Fire dampers for 24 months from the date of shipment

## End Switches & Electromagnet release

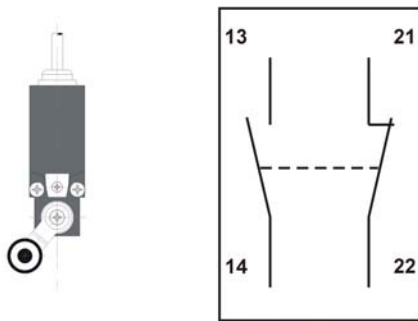


Fig. 11 Wiring scheme of terminal switch XCKN2118G11

### Electrical connection

Terminal switch is used for signaling damper leaf position. As standard it is connected for signalization of damper leaf closing. As standard is delivered type – Schneider Electric: XCKN2118G11.

Technical data	XCKN2118G11
Feeding voltage	AC 240 V, 50/60Hz, 3 A
	DC 250 V, 0,1 A
Protection	IP 65

Tab. 3 Technical data of terminal switch

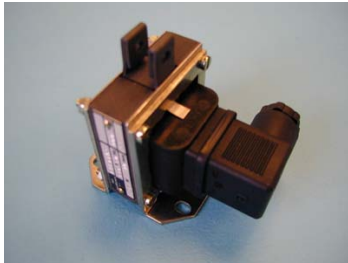


Fig. 12 Electromagnet

### Electromagnet

Electromagnet is used to release the damper – to close the damper leaf on the base of electric impulse from the central control unit. Electromagnet releases the release mechanism, which closes the damper leaf. As standard is electromagnet EVJ 1142 delivered.

Rated voltage:	230 V/ 50 Hz 24 V/50 Hz
Load factor :	40 %
Rated pull :	10 N
Rated stroke :	max. 10 mm
Degree of protection :	IP55
Version :	push
Mechanical service life:	1 mil. switching

Tab. 4 Technical parameter of electromagnet

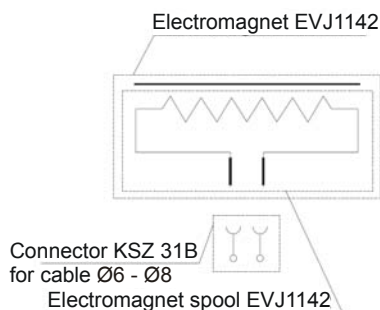


Fig. 13 Wiring scheme of electromagnet

## Fire Damper Valves



### **PV-I-R-EI60S, -EI90S and -EI120S**

Fire damper air valves are manufactured and tested to latest European standards.

Tested and certified for resistance classes 60, 90 and 120 minutes.

Fire damper valves are available in 3 sizes: Ø 100, 125, 160 and 200mm and are all equipped as standard with thermal fusible link set at 72°C. Upon rise of temperature above the set limit, the fusible link releases the damper assembly to set from open to close position,

The damper blades are maintained mechanically in the safety position for minimum time required by the product classification for the fire and smoke transmission.

Micro-contact switches are available as optional accessories to be mounted on site to indicate the damper closed position.

### **Ordering codes:**

Fire resistance class	60S, 90S and 120S	PV-I-R-EI	
Dimension	Ø		
Accessory	End switch	DV1	

### **Installation:**

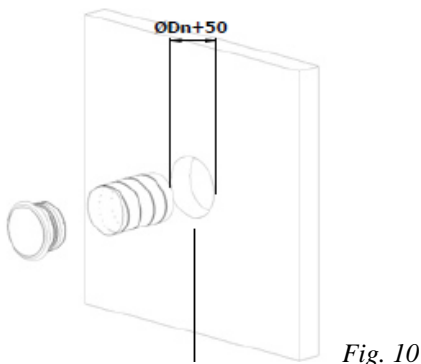


Fig. 10

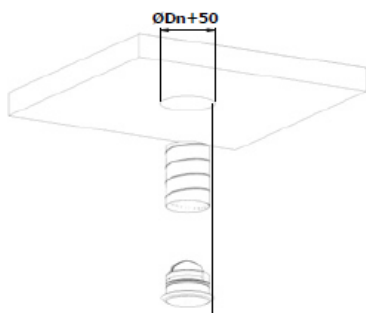


Fig. 11

### **Installation in partition concrete wall**

Fire damper valves are suitable to be installed into concrete partition walls directly onto the rigid ventilation duct.

Fire damper valves are tested for airflow in supply or return application.

As noted in figure10 adjacent, minimum opening of ØD + 50mm should be provided for the correct installation of the unit.

After installation of the valve into the ventilation duct, mixture of mortar or Rockwool (min. density of 80-100kg/m<sup>3</sup>) should be used to secure the duct into the partition wall

### **Installation in partition concrete ceiling**

Fire damper valves are suitable to be installed into concrete partition ceiling directly onto the rigid ventilation duct.

Fire damper valves are tested for airflow in supply or return application.

As noted in figure11 adjacent, minimum opening of ØD + 50mm should be provided for the correct installation of the unit.

After installation of the valve into the ventilation duct, mixture of mortar or Rockwool (min. density of 80-100kg/m<sup>3</sup>) should be used to secure the duct into the partition ceiling

## Shut-Off fire dampers and Intumescent Grills



### **BFD:**

BFD fire damper shutter valves are designed to be used for small ventilation applications. Ideal for small to multi residential buildings to protect the habitants of fire and Smoke risks.

BFD fire dampers are tested and are conform to EN 1366-2 to suit installations of 60, 90 and 120minuts.

Fire dampers are equipped with fusible link set to release at temperatures above 72°C.

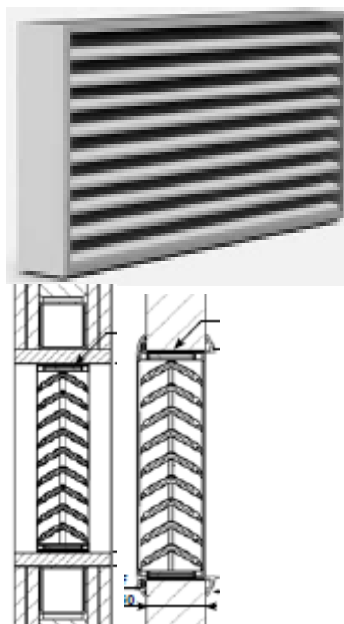
BFD fire dampers are easily placed in circular ducts, whilst the special designed rubber gasket will maintain the unit in place and keep smoke integrity as designed.

Available in 4 dimensions, sizes Ø100, 125, 160 and 200mm.

BFD fire dampers are manufactured from Galvanized mild steel casing and silicate butterfly damper blades

### **Ordering codes:**

Fire resistance class	60S, 90S, 120S	BFD-EI		
Dimension	Ø			



### **ITFG:**

Intumescent transfer fire grills are designed to be non-vision fire grills for the door or wall application.

Constructed from Plastic profiles filled with intumescent strips, are easy to install in rigid walls or doors.

ITFG can be supplied with a mounting frame to suite a doors and walls.

Mounting frame provides a fixed (code FF)or variable installation depth (code AF)

ITFG are tested in accordance to, EN 1364-1, 1364-2 and EN-1634-1

Available sizes are from 100x100mm to 800x400mm

ITFG is tested and classified as EI30, EI60 and EI90(v<sub>e</sub>)

### **Ordering codes:**

Fire resistance class	30, 60 and 90	ITFG-EI			
Dimension	L (100-800mm) H (100-400mm)				
Accessories (counter frame)	FF AF				

## Intumescent Grills



### **IFG-S-60 and -120**

Intumescent fire grills types IFG-S-60 or -120 are designed to be used as transfer grills with fire resistance barrier for 60 and 120minutes.

Constructed with intumescent strips housed in plastic, all blades are set horizontal and vertically to assure lowest pressure loss for air transfer.

IFG is constructed to be installed in Door or imbedded into walls.

Available in sizes 150 x 100mm to 600x400mm.

IFG-S-60 consists of a single unit and to achieve 120 minutes, two units will need to be mounted back to back.

IFG-S units are available as optional extra with mounting frame to facilitate installation where needed (code FF)

Blade setting of these units are horizontal as standard, and can be manufactured on incline as shown on adjacent picture upon request (code I)

IFG-S grills are available on demand for large installation of up to 1200x800mm upon request.

#### **Ordering codes:**

	<b>IFG-S-</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire resistance class	60 and 120					
Dimension	L (150-600mm)					
	H (100-400mm)					
Blade Inclination	H					
	I					
Accessory	FF					



### **IFG-R-60 and -120**

Intumescent fire grills types IFG-R-60 or -120 are designed to be used as transfer grills with fire resistance barrier for 60 and 120minutes.

Constructed with intumescent strips housed in plastic, all blades are set horizontal and vertically to assure lowest pressure loss for air transfer.

IFG is constructed to be installed in Door or imbedded into walls.

Available in 11 sizes Ø80 mm to Ø400mm.

IFG-R-60 consists of a single unit and to achieve 120 minutes, two units will need to be mounted back to back.

IFG-R units are available as optional extra with mounting frame to facilitate installation where needed (code FF)

#### **Ordering codes:**

	<b>IFG-R-</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire resistance class	60, 120			
Dimension	Ø			
Accessory	FF			



## Actuators & Control accessories



Fig. 14 Actuator BLF

### Actuator operation Types: DV7 / DV8 / DV9-T / DV9-T-ST

For operation of damper blade are used actuator BELIMO type BLF24-T / ST, BLF230-T, BF24-T / ST, BF230-T with return spring.

Type BLF is used for round dampers to  $\varnothing 500$  mm included.

Type BF is used for round dampers above  $\varnothing 500$  mm.

### Function of actuator

After connection to el. feeding is actuator put into operation position and at the same time actuator return spring tightens. That means that the damper leaf is in operation position open. After disconnecting the el. feeding or breaking the heat fuse the damper leaf closes with energy of return spring - accident position. Thermoelectrical release device BAE72B-S breaks when the ambient temperature or the temperature INSIDE the damper exceeds  $72^{\circ}\text{C}$ . In actuator are, as standard, situated two firmly fixed and set up micro switches for indication of damper end positions- indication of opening and closing the damper.

## Wiring diagrams

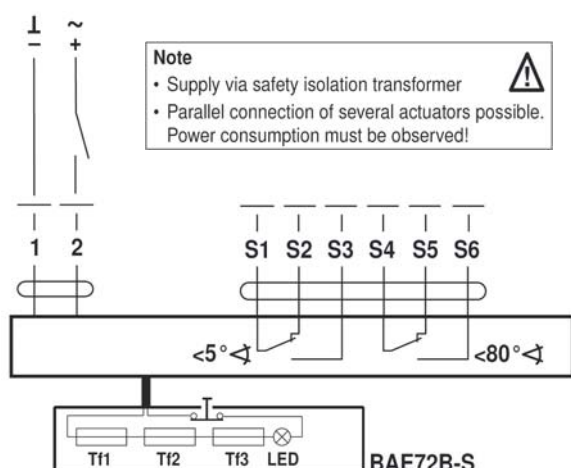


Fig. 15 Wiring scheme of actuator BELIMO BLF24-T

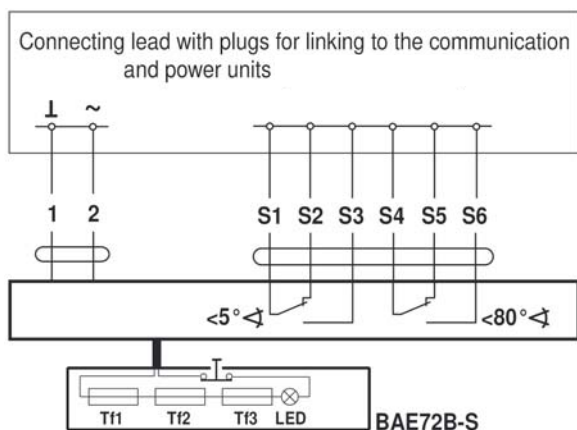


Fig. 16 Wiring scheme of actuator BELIMO BLF24-T-ST

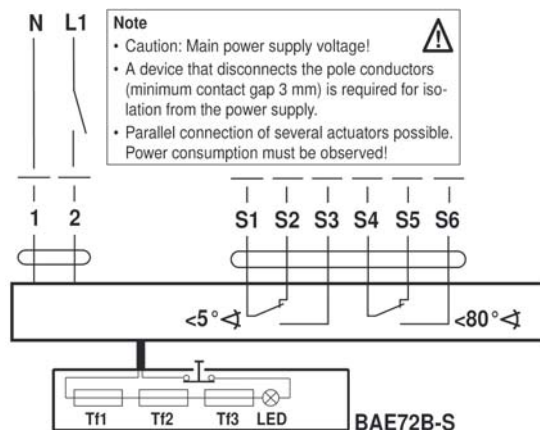


Fig. 17 Wiring scheme of actuator BELIMO BLF230-T

## Actuators & Control accessories



Fig. 18 Actuator BF

### Actuator operation Types: DV7 / DV8 / DV9-T / DV9-T-ST

For operation of damper blade are used actuator BELIMO type BLF24-T / ST, BLF230-T, BF24-T / ST, BF230-T with return spring.

Type BLF is used for round dampers to  $\varnothing 500$  mm included.

Type BF is used for round dampers above  $\varnothing 500$  mm.

### Function of actuator

After connection to el. feeding is actuator put into operation position and at the same time actuator return spring tightens. That means that the damper leaf is in operation position open. After disconnecting the el. feeding or breaking the heat fuse the damper leaf closes with energy of return spring - accident position. Thermoelectrical release device BAE72B-S breaks when the ambient temperature or the temperature INSIDE the damper exceeds  $72^{\circ}\text{C}$ . In actuator are, as standard, situated two firmly fixed and set up micro switches for indication of damper end positions- indication of opening and closing the damper.

## Wiring diagrams

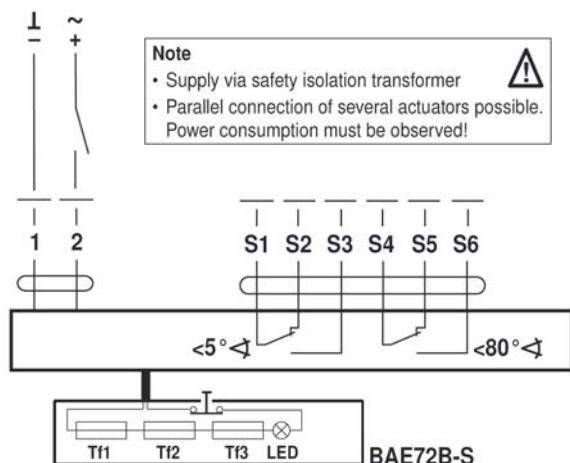


Fig. 19 Wiring scheme of actuator BELIMO BF24-T

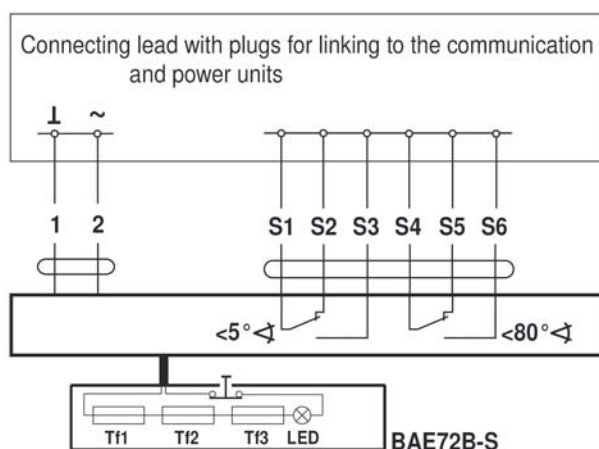


Fig. 20 Wiring scheme of actuator BELIMO BF24-T-ST

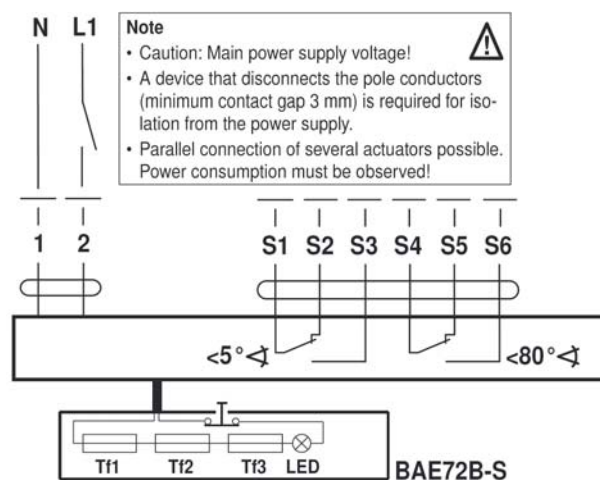


Fig. 21 Wiring scheme of actuator BELIMO BF230-T

## Actuators & Control accessories

BLF24-T, BLF24-T-ST	
Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
Nominal voltage range	AC 19,2 ... 28,8 V / DC 21,6 ... 28,8 V
Activation temperature of thermal fuses	Tf1: duct outside temperature 72 °C
	Tf2 + Tf3: duct inside temperature 72 °C
Power consumption	
- motoring	5 W @ nominal torque
- holding	2,5 W
- for wire sizing	7 VA / I <sub>max</sub> . 5.8 @ 5 ms
Protection class	III Safety extra-low voltage
Degree of protection	IP 54 in all mounting positions
Auxiliary switch	2 x 1 SPDT
- contact rating (contacts gold plate on silver)	1 mA ... 3 A (0.5 A), DC 5 V ... AC 250 V
- switching points	5 ° / 80 °
Connecting cable Motor	BLF24-T 1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free) BLF24-T-ST 1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free) with plug connectors, suitable for BKN230 / 24
Connecting cable Auxiliary switch	BLF24-T 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free) BLF24-T-ST 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free) with plug connectors, suitable for BKN230 / 24
Angle of rotation	Max. 95° (incl. 5° spring pre-tensioning)
Damper rotation	Form-fit □ 12 mm ( □ 10 mm with adapter supplied)
Torque	
- motor	Min. 6 Nm
- spring-return	Min. 4 Nm
Running time	
- motor	40 ... 75 s (0 ... 6 Nm)
- spring- return	~20 s @ -20 ... +50 °C / max. 60 s @ -30 °C
Direction of rotation	Selected by mounting L / R
Position indication	Mechanical with pointer
Ambient temperature	-30 ... +50 °C
Safety duty	The safe position will be attained up to max. 75 °C
Non-operating temperature	-40 ... +50 °C
Ambient humidity range	According to EN 60730-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Noise level	Motor - max. 45 dB (A) Spring-return - ~62 dB (A)
Service life	Min. 60 000 safe positions
Maintenance	Maintenance-free
Weight	Approx. 1630 g

Tab. 5 Technical data of actuator BLF24-T, BLF24-T-ST

## Actuators & Control accessories

<b>BLF230-T</b>	
Nominal voltage	AC 230 V, 50/60 Hz
Nominal voltage range	AC 198 ... 264 V
Activation temperature of thermal fuses	Tf1: duct outside temperature 72 °C
	Tf2 + Tf3: duct inside temperature 72 °C
Power consumption	
- motoring	6 W @ nominal torque
- holding	3 W
- for wire sizing	7 VA / I <sub>max</sub> : 150 mA @ 10 ms
Protection class	II Totally insulated
Degree of protection	IP 54 in all mounting positions
Auxiliary switch	2 x 1 SPDT
- contact rating (contacts gold plate on silver)	1 mA ... 3 A (0.5 A), DC 5 V ... AC 250 V
- switching points	5 ° / 80 °
Connecting cable Actuator	1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)
Connecting cable Auxiliary switch	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)
Angle of rotation	Max. 95° (incl. 5° spring pre-tensioning)
Damper rotation	Form-fit □ 12 mm ( □10 mm with adapter supplied)
Torque	
- motor	Min. 6 Nm
- spring-return	Min. 4 Nm
Running time	
- motor	40 ... 75 s (0 ... 6 Nm)
- spring- return	~20 s @ -20 ... +50 °C / max. 60 s @ -30 °C
Direction of rotation	Selected by mounting L / R
Position indication	Mechanical with pointer
Ambient temperature	-30 ... +50 °C
Safety duty	The safe position will be attained up to max. 75 °C
Non-operating temperature	-40 ...+50 °C
Ambient humidity range	According to EN 60730-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC, CE according to 73/23/EEC
Noise level	Motor - max. 45 dB (A) Spring-return - ~62 dB (A)
Service life	Min. 60 000 safe positions
Maintenance	Maintenance-free
Weight	Approx. 1730 g

Tab. 5 Technical data of actuator BLF230-T

## Actuators & Control accessories

BF24-T, BF24-T-ST	
Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
Nominal voltage range	AC 19,2...28,8V / DC 21,6...28,8 V
Activation temperature of thermal fuses	Tf1: duct outside temperature 72 °C
	Tf2 + Tf3: duct inside temperature 72 °C
Power consumption	
- motoring	7 W @ nominal torque
- holding	2 W
- for wire sizing	10 VA / I <sub>max</sub> . 5.8 @ 5 ms
Protection class	III Safety extra-low voltage
Degree of protection	IP 54 in all mounting positions
Auxiliary switch	2 x 1 SPDT
- contact rating (contacts gold plate on silver)	1 mA ... 6 A (3 A), DC 5 V ... AC 250 V
- switching points	5 ° / 80 °
Connecting cable	
- motor	BF24-T 1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free) BF24-T-ST 1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free) with plug connectors, suitable for BKN230/ 24
- auxiliary switch	BF24-T 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free) BF24-T-ST 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free) with plug connectors, suitable for BKN230/ 24
Angle of rotation	Max. 95° (incl. 5° spring pre-tensioning)
Damper rotation	Form-fit □ 12 mm ( □ 10 mm with adapter supplied)
Torque	
- motor	Min. 18 Nm
- spring-return	Min. 12 Nm
Running time	
- motor	140 s
- spring- return	~16 s (t <sub>amb</sub> = 20 °C)
Direction of rotation	Selected by mounting L/R
Position indication	Mechanical with pointer
Ambient temperature	-30 ... +50 °C
Safety duty	The safe position will be attained up to max. 75 °C
Non-operating temperature	-40 ...+50 °C
Ambient humidity range	According to EN 60730-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
Noise level	Motor - max. 45 dB (A) Spring-return - ~62 dB (A)
Service life	Min. 60 000 safe positions
Maintenance	Maintenance-free
Weight	Approx. 2800 g

Tab. 6 Technical data of actuator BF24-T, BF24-T-ST a BF230-T

## Actuators & Control accessories

<b>BF230-T</b>	
Nominal voltage	AC 230V, 50/60 Hz
Nominal voltage range	AC 198...264 V
Activation temperature of thermal fuses	Tf1: duct outside temperature 72 °C
	Tf2 + Tf3: duct inside temperature 72 °C
Power consumption	
- motoring	8 W @ nominal torque
- holding	3 W
- for wire sizing	12,5 VA / I <sub>max</sub> . 500 mA @ 5 ms
Protection class	II Totally insulated
Degree of protection	IP 54 in all mounting positions
Auxiliary switch	2 x 1 SPDT
- contact rating (contacts gold plate on silver)	1 mA ... 6 A (3 A), DC 5 V ... AC 250 V
- switching points	5 ° / 80 °
Connecting cable	
- motor	1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)
- auxiliary switch	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)
Angle of rotation	Max. 95° (incl. 5° spring pre-tensioning)
Damper rotation	Form-fit □ 12 mm ( □10 mm with adapter supplied)
Torque	
- motor	Min. 18 Nm
- spring-return	Min. 12 Nm
Running time	
- motor	140 s
- spring- return	~16 s (t <sub>amb</sub> = 20 °C)
Direction of rotation	Selected by mounting L/R
Position indication	Mechanical with pointer
Ambient temperature	-30 ... +50 °C
Safety duty	The safe position will be attained up to max. 75 °C
Non-operating temperature	-40 ...+50 °C
Ambient humidity range	According to EN 60730-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC, CE according to 73/23/EEC
Noise level	Motor - max. 45 dB (A) Spring-return - ~62 dB (A)
Service life	Min. 60 000 safe positions
Maintenance	Maintenance-free
Weight	Approx. 3100 g

Tab. 6 Technical data of actuator BF230-T



## Belimo Controls & Accessories



Fig. 22 Thermoelectrical release device with control button BAE72B-S

### Thermoelectrical release device with control button

Thermoelectrical release device controls closing of the leaf in case of exceeding marginal temperature- accident position. Device contains three thermal fuses Tf1, Tf2 and Tf3. If the ambient temperature exceeds 72°C thermal fuse Tf1 will break or if the temperature inside the damper exceeds 72°C thermal fuses Tf2 and Tf3 will break. After any of the fuses break feeding voltage will be permanently aborted and damper leaf will be closed by the energy of spring-return accident position. By mechanical damage or damage in case of exceeding temperature above 72°C of thermal fuse Tf2 and Tf3 it is possible to replace them as a spare part, which must be ordered separately upon an agreement with the producer as accessories.

**ATTENTION:** Thermal fuse Tf1, is not possible to replace in case of any type of damage! Therefore it is not allowed to manipulate with open fire around the fire damper as well as with other sources of heat and radiation (for example-when welding), so that no damage of the thermal fuse itself or other parts of the fire damper will happen.



Fig. 23 Communication and supply unit BKN230-24

### Communication and control systems of connecting actuator

In buildings are used various operation systems, controls and communications with fire (or smoke) dampers.. It is possible to deliver actuator BELIMO BF.... and BLF..... with communication and control units of type BKN230-24, BKS24-1B + ZSO-11 and BKS24-9A. Their purpose and function are described below.

#### Communication and supply unit BKN230-24

Communication and supply unit BKN230-24 is used for connecting damper actuator to operation systems, systems of control and communication with fire damper. BKN230-24 is a standard part of damper when DV9-T-ST manufacture.

1. connection: power supply AC 230 V
2. plug-in contacts for Belimo actuator 24 V
3. screw terminals, 7 poles
4. cable inputs for Belimo actuator
5. cable input for 2-wire conductor
6. transparent protection cover
7. LED-indication, green (AC 24 V motor)

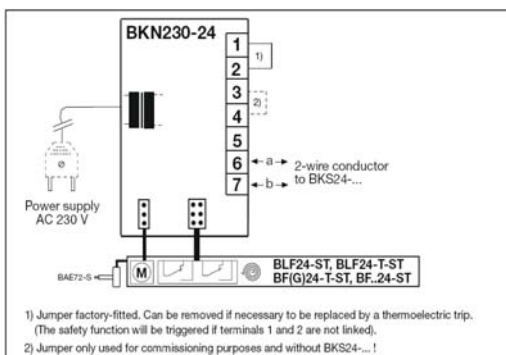


Fig. 24 Wiring scheme of BKN230-24

Nominal voltage	AC/DC 24 V
Nominal voltage range	AC 198...264 V
For wire sizing	11 VA (incl. servo drive)
Power consumption	3.5 W
Connecting cable	
- network	Cable 1 m, with Euro plug
- motor	6 pole connector 3 pole connector
- auxiliary switch	2 x 1.5 mm <sup>2</sup>
Protection class	II (all voltages)
Degree of protection	IP 54
Ambient temperature range	- 20 ... +50 °C
Non-operating temperature	- 40 ... +80 °C
Ambient humidity range	According to EN 60335-1
EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC
regulation for low voltages	CE according to 73/23/EEC
maintenance	Maintenance-free
weight	550 g

Tab. 7 Technical data of BKN230-24

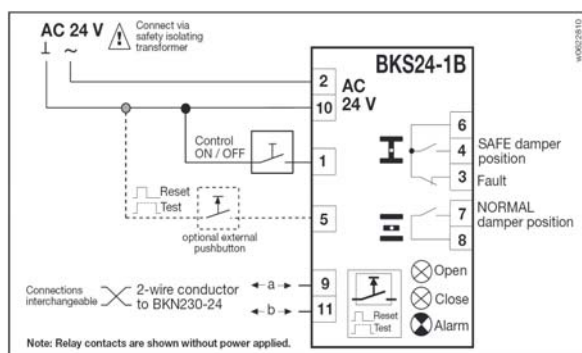
## Belimo Controls & Accessories



Fig. 25 Communication and control unit BKS24-1B + ZSO-11

### Communication and control unit BKS24-1B + ZSO-11

BKS24-1B + ZSO-11 is used for control and monitoring of fire damper position of damper leaf - open / close. For connection of damper actuator to this system it is necessary to use communication and supply unit BKN230-24. It is possible to connect only one fire damper to unit BKS24-1B + ZSO-11. The advantage of this system is the possibility to connect unit BKS24-1B + ZSO-11 into higher central systems of building control and control of damper position could be then remote-controlled without the need of un-installation of inspection lid on the damper and visual control of damper leaf position inside the duct. Communication and control unit BKS24-1B + ZSO-11 is not a part of standard delivery of fire damper and must be ordered separately as accessories (see „Ordering“). Connecting cables between BKS24-1B + ZSO-11 and BKN230-24 are not a part of the delivery.



Signalling and diagnosis					
LEDs			Contacts	Description	
Open	Close	Alarm	Status	Causes / Sequence	
⊗ OFF	⊗ OFF	⊕ OFF	⑥-③	No AC 24 V power supply	
⊗ ON	⊗ ON	⊕ ON	⑥-③	Test run ca. 35 s, triggered by: AC 24 V energising or by pressing "Reset / Test"	
⊗ OFF	⊗ OFF	⊕ flash	⑥-③	New fault, possible causes: • Short-circuit or open-circuit in 2-wire conductor or damper fault (BKN...) • No AC 230 V • Defective thermal trip • Smoke detector triggered • Running time exceeded • Damper jammed	
⊗ OFF	⊗ OFF	⊕ ON	⑥-③	Stored fault • Signal given that there has been a fault in the system and it should be checked	
⊗ OFF	⊗ flash	⊕ OFF	⑥-④	Damper (actuator) moving to the safe position	
⊗ OFF	⊗ ON	⊕ OFF	⑥-④	Damper in the safe position I	
⊗ flash	⊗ OFF	⊕ OFF	⑥-⑦	Damper (actuator) moving to the operating position	
⊗ ON	⊗ OFF	⊕ OFF	⑥-⑦	Damper in the operating position II	

Fig. 26 Wiring scheme of BKS24-1B + ZSO-11

Technical data	BKS24-1B
Nominal voltage	AC 24 V 50/60Hz
Nominal voltage range	AC 19.2...28.8 V
For wire sizing	3 VA
Power consumption	2.5 W
Connection	Submagnal connector 11 pole, suitable for ZSO-11 socket (ZSO-11 plug socket not included, order separately!)
Auxiliary switches	6 A (2 A), AC 24 V
Protection class	IP 30 (safety low voltage)
Degree of protection	IP 30
Ambient temperature range	0...+ 50 °C
EMC	CE according to 89/336/EEC
Maintenance	maintenance free
Weight	150 g

Tab. 8 Technical data of BKS24-1B + ZSO-11

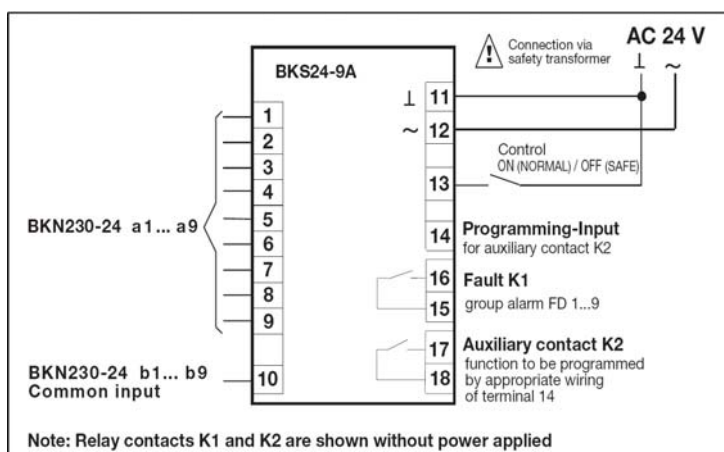
## Belimo Controls & Accessories



Fig. 27 Communication and control unit BKS24-9A

### Communication and control unit BKS24-9A

BKS24-9A is used for control and monitoring of fire damper position – open / close of damper leaf. For connection of damper actuator to this system it is necessary to use communication and supply unit BKN230-24. It is possible to connect up to 9 fire dampers to unit BKS24-9A. The advantage of this system is the possibility to connect unit BKS24-9A into higher central systems of building control and control of damper position could be then remote - controlled without the need of un-installation of inspection lid on the damper and visual control of damper leaf position inside the duct. Communication and control unit BKS24-9A is not a part of standard delivery of fire damper and must be ordered separately as accessories (see „Ordering“). Connecting cables between BKS24-9A and BKN230-24 are not a part of the delivery.



Function Contact K1		Programming Auxiliary Contact K2		
Situation	Status	Function	Wiring	Status
Alarm	15 — 16	Contact K2 closed, when all Dampers OPEN (NORMAL)	14 — 11 ⊥	17 — 18
		Contact K2 closed, when Damper Nr.1 OPEN (NORMAL)	14 — 12 ~	
NO Alarm	15 — 16	Contact K2 closed, when all Dampers CLOSED (SAFE)	14 left open	

Fig. 28 Wiring scheme of BKS24-9A

Technical data	BKS24-9A
Nominal voltage	AC 24 V 50/60Hz
Nominal voltage range	AC 21.6...28.8 V
For wire sizing	5.5 VA (Imax. 6.4 A @ 2.5ms)
Power consumption	3.5 W
Electrical connection	Terminals for 2 x 1.5 mm <sup>2</sup>
Lengths of conductors	
• 2-wire-conductors a/b	max. 600 m (wire size 0.75 mm <sup>2</sup> )
• control input 13	max. 600 m (wire size 0.75 mm <sup>2</sup> )
Auxiliary contact	AC 24 V @ 0.5 A
Protection class	III safety extra-low voltage
Degree of protection	IP 20
Ambient temperature	0...+ 50 °C
EMC	CE according 89/336/EEC
Mode of operation	Type 1 (EN 60730-1)
Maintenance	maintenance free
Weight	160 g

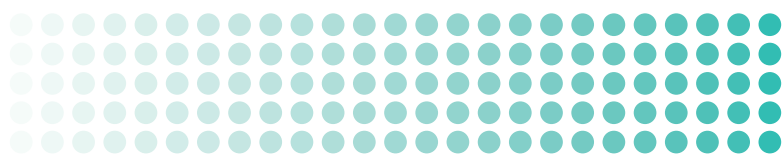
Tab. 8 Technical data of BKS24-9A





Systemair AB SE-739 30 Skinnskatteberg, Sweden  
Tel +46 222 440 00 Fax +46 222 440 99  
mailbox@systemair.se www.systemair.com

# Systemair Fire damper



**PVM**  
**Fire air grilles**



The present technical specifications define sizes, properties, scope of utility and manufacture of fire partition dampers. The specifications apply to the design, ordering, production, acceptance and use of these products from June 1st, 2006.

## General

PVM Partition Fire Dampers are used as a fire shut-off element, which connects two adjacent fire areas without connecting duct.

Fire Air Grille is tightly installed into the dividing fire construction. In case of fire, blades of the grille close the openings and stop the fire from spreading to other fire area.

## Construction Features

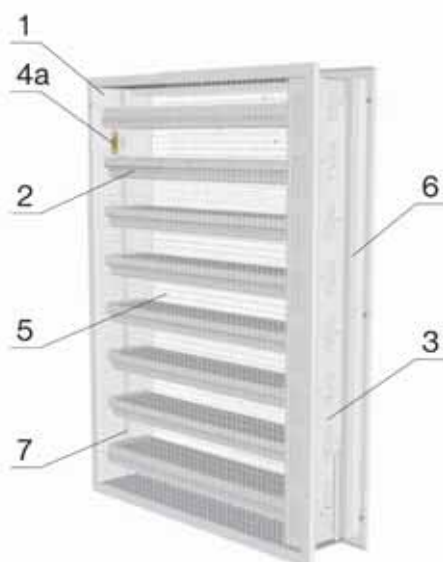


Figure 1- PVM

- 1. Frame
- 2. Dividing insulating blades
- 3. Closing mechanism with spring
- 4a. Fusible link

Grilles IMOS- PVM Partition Fire Dampers are manufactured from fire resistant material (DI) based on STN 73 0852, tested according to STN EN 1634-1:2001 and classified according to STN EN 13501-2:2005 as EI 90, EI 120, EI 20 and EW60 and manufactured with servomotor EI 60, EI 120, EI 20 and EW60.

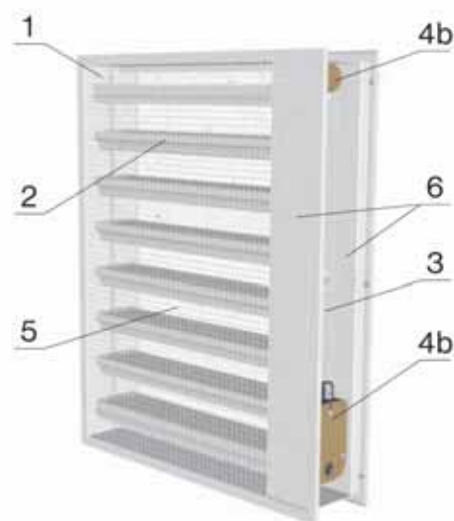


Figure 2- Grille PVM with Actuator

- 4b. Actuator driven with thermal link cut-off switch
- 5. Protecting grille
- 6. Protecting box of mechanism
- 7. Active fire sealing

## Material Final Manufacture

The frame of the grille is made of zinc-plated construction steel. Blades 2 which rotation axis is horizontal are placed in the frame. Dividing insulating blades are made of calcium silicate sheets. Blades are closing contradictory with help of closing mechanism 3 (shifter and spring) or servo drive and spring 3+4b. Blades are maintained in open position by fusible link until the air temperature reaches above 72°C.

When PVM units are Actuator driven, blades are maintained in open position with the motor itself. The damper mechanism is driven to closed position by the

actuator when the air temperature exceeds 72°C. Protection grille 5 prevents the contact with surface of the blades that have higher temperature when fire. At the same time, protecting grille forms air space between the blades and the grille where the air flows and cools down the surface of blades. Protection grilles are delivered painted as standard with powder RAL 9007. Protecting box 6 stops the heat to get through closing mechanism. Intumescent self expanding seals 7 fill the spaces between the frame and blades and between the blades themselves by changing their volume, which is caused by the heat.



## Manufacturing the grille

- ZV – Basic set consists of grille with fusible link
- DV1 – ZV+ terminal switch indicating “CLOSED”- voltage 24V AC/DC
- DV2 – ZV+ terminal switch indicating “CLOSED”- voltage 230V AC
- DV7 – ZV+ grille with servo motor and thermoelectric switch BELIMO BLF 230-T, working voltage 230V AC, indicating “ OPEN” and “CLOSED”
- DV9 – ZV+ grilles with servo motor and thermoelectric switch BELIMO BLF 24-T, working voltage 24V AC/DC, indicating “ OPEN” and “ CLOSED”.

## Technical Conditions

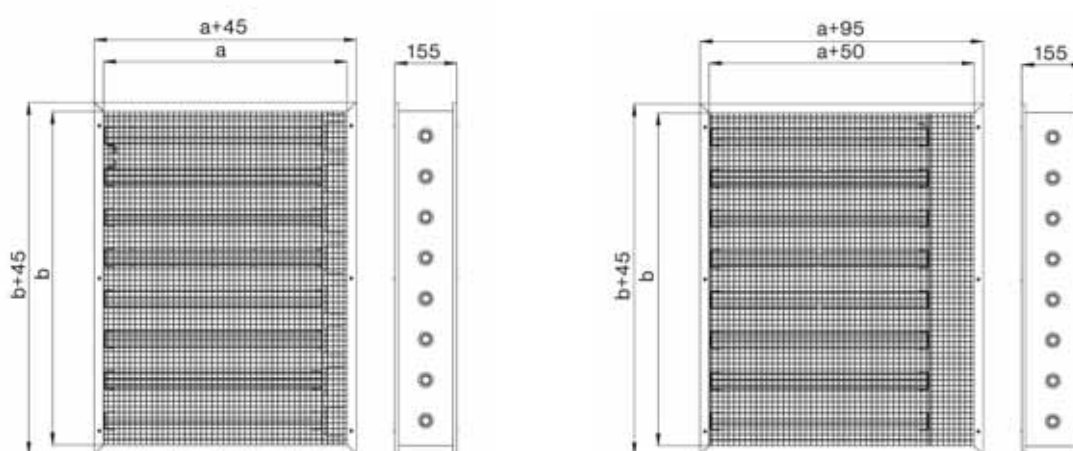


Figure 3- Main dimensions of PVM and PVM with Actuator

Table I – Dimensions and weights of grilles IMOS-PVM

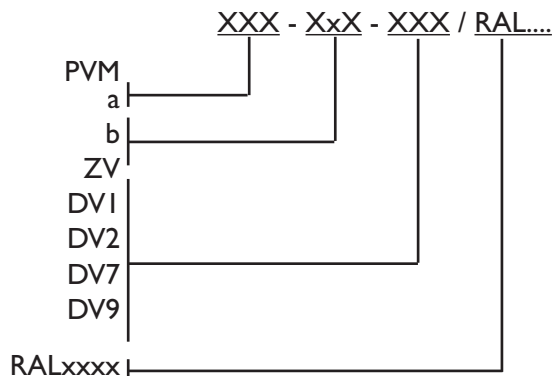
Dimensions axb in mm		Weight in kg		A <sub>efv</sub> Vm <sup>2</sup>	Dimensions axb in mm		Weight in kg		A <sub>efv</sub> Vm <sup>2</sup>
		Zv,DV1 a DV2	DV7 a DV9				Zv,DV1 a DV2	DV7 a DV9	
200 x	220	6.6	x	0.020	500 x	220	11.2	x	0.062
	320	9.2	10.1	0.028		320	15.5	16.5	0.088
	420	11.8	13.0	0.036		420	19.9	21.2	0.114
	520	14.4	15.8	0.045		520	24.3	26.0	0.149
	620	17.0	18.7	0.053		620	28.6	30.6	0.167
	720	19.5	21.4	0.062		720	33.0	35.3	0.194
	820	22.2	24.4	0.070		820	37.4	40.1	0.220
300 x	220	8.1	x	0.034	600 x	220	12.7	x	0.076
	320	11.3	12.4	0.048		320	17.7	18.5	0.108
	420	14.5	16.0	0.062		420	22.7	23.8	0.140
	520	17.8	19.6	0.077		520	27.7	29.0	0.173
	620	21.0	23.1	0.091		620	32.6	34.2	0.205
	720	24.2	26.6	0.106		720	37.6	39.4	0.238
	820	27.4	29.6	0.120		820	42.6	44.7	0.270
400 x	220	9.6	x	0.048	Notes: X – Models DV7 and DV9 are manufactured to the dimension B= 320 mm  "Non standard dimensions" can only be made available on the damper width within the range of 200 to 600 mm maximum  Weight ± 10%				
	320	13.3	14.3	0.068					
	420	17.1	18.4	0.088					
	520	20.9	22.5	0.109					
	620	24.6	26.5	0.129					
	720	28.4	30.6	0.150					
	820	32.2	34.7	0.170					

## Product ordering

The following information and data must be included in the order:

### Designation

Fire Air Grille  
width (nominal dimension in mm)  
height (nominal dimension in mm)  
Manufacture



RAL of protecting outer grille  
standard RAL 9007

Ordering example: PVM 200x520 DVI 12 pieces

### Product information (about the product):

Each unit is factory labeled with the following information prior to packing and shipment:

- Grille model
- Fire resistance
- Technical standard under which the fire resistance has been rated
- Product conformity mark
- Product designation
- Company name and address
- Year of manufacturing

## Checking, acceptance and warranty

Each unit is checked by the manufacturer and is delivered with blades in open position. Dimensions are controlled by common measurements. These must be accepted by manufacturing documents and nominal dimensions as stated in tables 1 and 2. Manufacturer grants a period of 24 months of warranty from the shipping date.

## Mounting, adjustment and maintenance

Installation of the PVM is stated by concrete ventilation project, which must stand the standard STN 73 0872. The grille is mounted into fire-rated partition construction in a way that axis of the damper blades are always kept horizontally. Mounting openings are built as it can be seen in picture 4. Plaster/Mortar mixture is used

to seal the slot between the fire-rated partition wall and cover of the grille.

After installation the grille is tested to prevent problems with opening and closing of the blades. By ZV, DVI and DV2 is the protecting grille uninstalled on the side of the heat fuse. This heat fuse is pushed to open and is left to close itself. Blades are opened afterwards and the fuse is put to the original position. By DV7 and DV9 is installing of the grill according to electric schemes needed. It is also needed to do the test (OPEN-CLOSE) with help of servomotor.

Servomotor has to be installed to electrical circuit before mounting it to fire construction. Access to terminal block of servomotor is pictured in pic.5. After uninstalling the protecting grille is the protecting cover of servomotor uninstalled. Under the protecting cover of servomotor is terminal block hidden, what is for better manipulation while uninstalling it by releasing labeled screws.

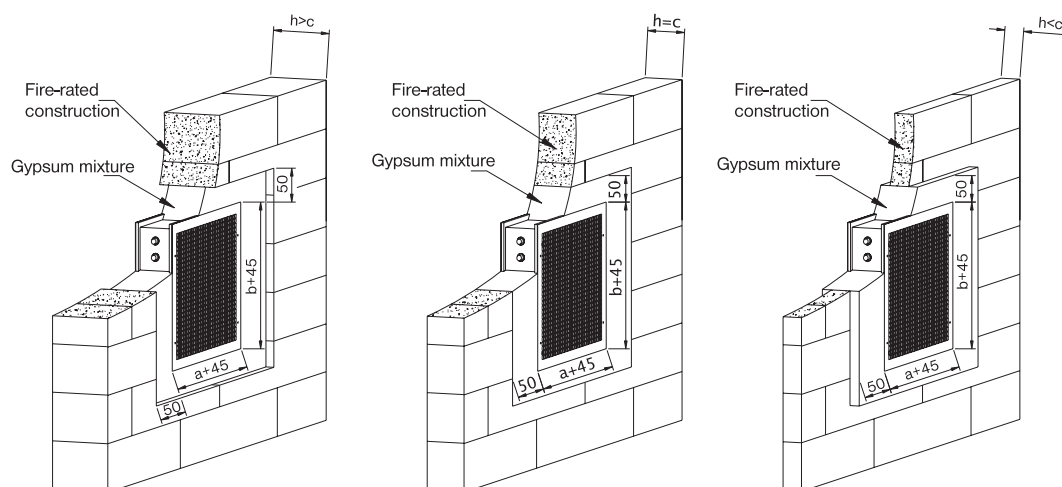


Figure 4. Installation of PVM in fire-rated partition construction with variable thickness

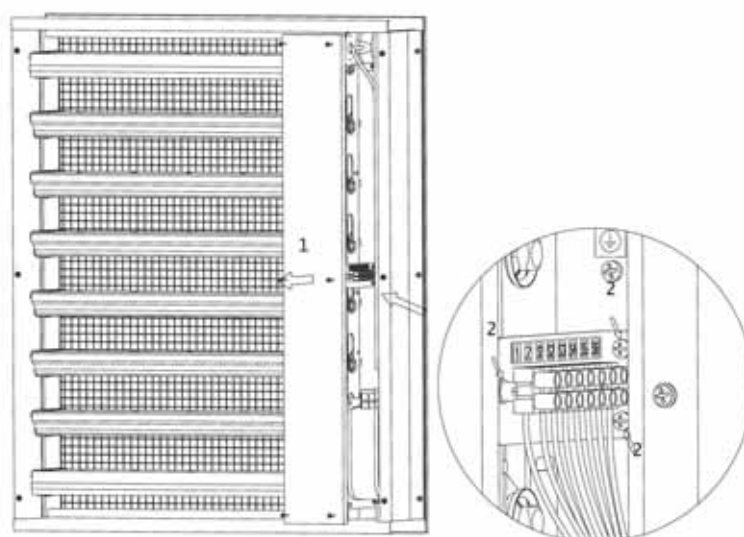
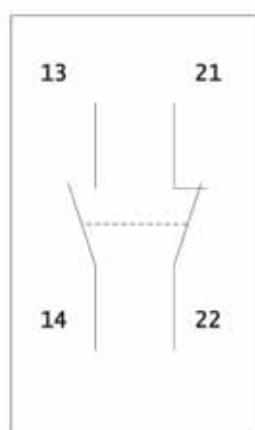


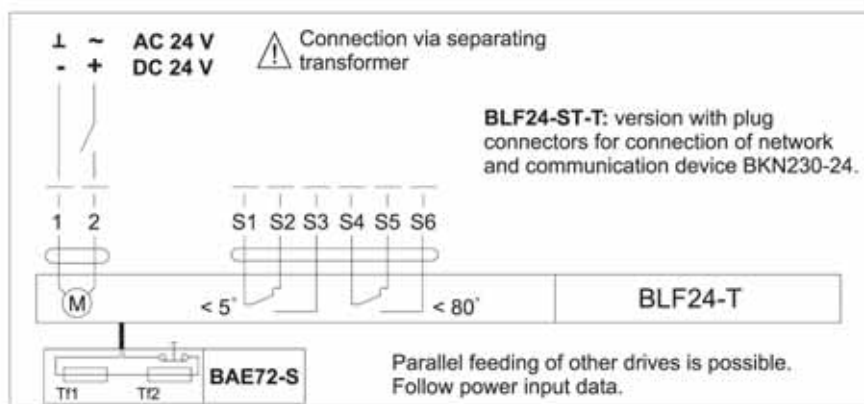
Figure 5 Dismounting of the terminal block from IMOS-PVM with actuator.

Scheme 1. Limit switch XCKN2118G11 (manufacture DVI and DV2)



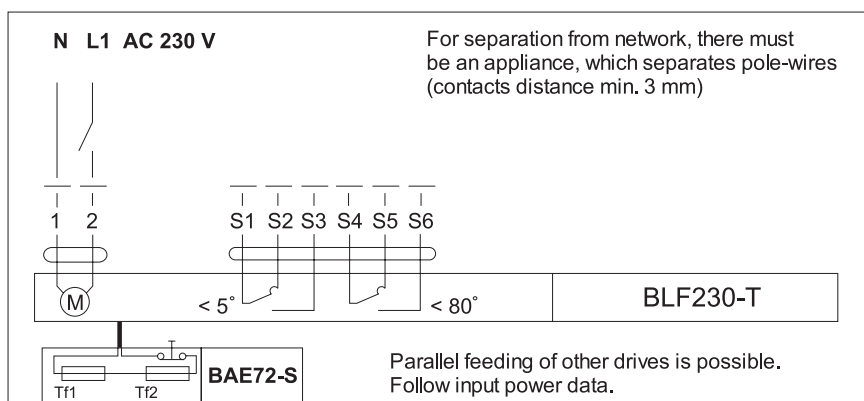
Technical parameters	XCKN2118G11
power voltage	AC 240V, 50/60 Hz, 3A DC 250V, 0.1A
protection system	IP 65

Scheme 2. Servodrive Belimo BLF 24-T



Technical parameters	BFL24-T
Feeding voltages	AC 24V 50/60 Hz, DC 24V
Function range	AC 19.2 – 28.8V DC 21.6 – 26.4V
Activation temperature of thermal fuses	Tf1: duct inner temperature 72°C Tf2: duct inner temperature 72°C * (order No. ZBAE72)
Power input	
- during spring fensing	5W
- in idle position	2.5W
- dimensioning	7 VA (I max. 5.8 A, 5ms)
Protection class	III
Protection	IP 54
Auxiliary switch	2 x EPU 6 (1.5)A, AC 250V, switch points 5°, 80°
Connection - motor	1 m cable, 2x0.75m <sup>2</sup> ...-ST with 3-pole plug
- auxiliary switch	1 m cable, 6x0.75m <sup>2</sup> ...-ST with 6-pole plug (BLF24-T-ST with connector plugs, suitable for BKN230-24)
Operating angle	95° (incl. 5° pre-tension of spring)
Dumper shaft	formed end 12 mm (with att. adapter 8/10 mm)
Torsional moment	motor: min. 4 Nm, drawback spring min. 4 Nm
Adjustment time	motor 40 – 75s (0 – 4 Nm) drawback spring 20 s (tamb=20°C)
Rotation direction	optional mounting left/right
Position indicator	mechanical with indicator
Ambient temperature	-30 – +50°C
Safe temperature	-30 – 70°C (functionality secured within 24 h)
Storage temperature	-40 – +50°C
Humidity control	according to EN 60335-I
EMC interference	CE according to 89/336/EWG and 92/31/EWG
Noise level	motor max. 45 dB(A), spring ≈62 dB(A)
Service life	min. 60000 accident positions
Maintenance	maintenance-free
Weight	1630 g

Scheme 3. Servodrive Belimo BLF 230-T



Technical parameters	BFL230-T
Feeding voltages	AC 24V 50/60 Hz
Function range	AC 198 – 264V
Activation temperature of thermal fuses	Tf1: duct inner temperature 72°C TF2: duct inner temperature 72°C * (order No. ZBAE72)
Power input - during spring fensing - in idle position - dimensioning	5W 3W 7 VA (I max. 150 A, 10ms)
Protection class	II
Protection	IP 54
Auxiliary switch	2 x EPU 6 (1.5)A, AC 250V, switch points 5°, 80°
Connection - motor - auxiliary switch	1 m cable, 2x0.75m <sup>2</sup> 1 m cable, 6x0.75m <sup>2</sup>
Operating angle	95° (incl. 5° pre-tension of spring)
Dumper shaft	formed end 12 mm (with att. adapter 8/10 mm)
Torsional moment	motor min. 4 Nm, drawback spring min. 4 Nm
Adjustment time	motor 40 - 75 s (0 - 4 Nm) drawback spring ≈20 s (tamb=20°C)
Rotation direction	optional mounting left/right
Position indicator	mechanical with indicator
Ambient temperature	-30 – +50°C
Safe temperature	-30 – 70°C (functionality secured within 24 h)
Storage temperature	-40 – +50°C
Humidity control	according to EN 60335-I
EMC interference	CE according to 89/336/EWG and 92/31/EWG
Noise level	motor max. 45 dB(A), spring ≈62 dB(A)
Service life	min. 60000 accident positions
Maintenance	maintenance-free
Weight	1630 g

## Packaging, transportation and storage

### Packaging

Separate grilles are delivered in PVC foils. The customer is required to deliver such cover to a waste disposal or recycling facility at his expense.

### Transportation

Transportation to the customer is organized with the use of ordinary means of transport and the cost is also to be borne by the customer. The grilles must be protected against damage and weather conditions.

### Storage

It is recommended that the grilles are kept in an closed and dry place. While storing, it is needed to protect the grilles from mechanical damage and from pollution. Grilles in standard version can be stored in temperature ranging -10 to +50 °C.

## Reports of testing

Numbers of reports will be stated in the certificate of size and complexion of a product that is attached to every grille.

## Appendix

Any deviations from the present technical specifications are subject to agreement with the manufacturer. The manufacturer hereby reserves the right to technical innovations without prior notice to customers.

Related standards:

STN 73 0802 Fire protection of building sites. Common statements.

STN EN 1634-1 Testing of the fire resistance of doors sets and closures. Part 1. Fire door and closures.

STN 73 0862 Fire protection of building sites. Determination of the level of building substance flammability.

STN 73 0872 Fire protection of building sites. Protection of building sites against spreading the fire by ventilation device.

STN 92 0201- 2 Fire protection of building sites. Common statements. Building constructions.

STN CR 12792 (12 0001) Ventilation of building sites. Symbols and terminology.

STN 92 0101 Fire protection of building sites. Terminology.

STN 92 0102 Fire protection of building sites. Values and signs.

STN EN 1634-3 Testing fire resistance of door sets and closures. Part3. Doors and closures sealed against the smoke spreading.



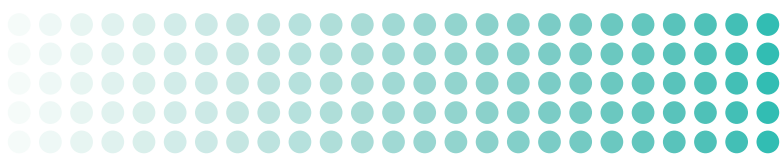


Systemair AB • SE-739 30 Skinnskatteberg, Sweden  
Tel +46 222 440 00 • Fax +46 222 440 99  
mailbox@systemair.se • www.systemair.com





# Systemair Fire damper



**DKI**  
**Smoke dampers**



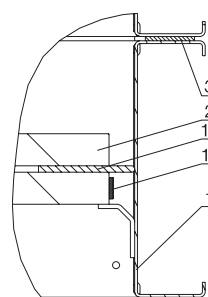
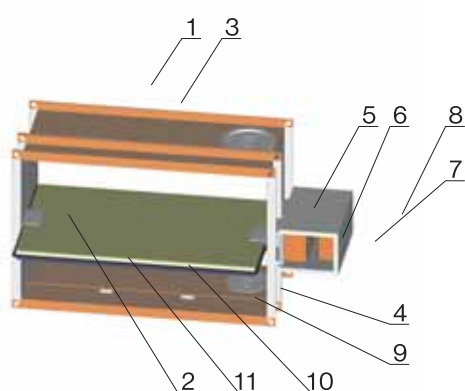
These specifications define the size, properties, and application range and construction features of DKI smoke dampers. The specifications apply to designing, ordering, manufacturing, acceptance, delivery and use of these products as of 1st May 2007.

## General

Smoke damper (hereinafter as damper) is a component of systems used for outlet of smoke and heat. It is manufactured in a way that the damper leaf would open

upon electrical impulse to enable exhaust of heat and smoke via special fan and in case it is needed, it would enable inlet of fresh air via an opening in the wall.

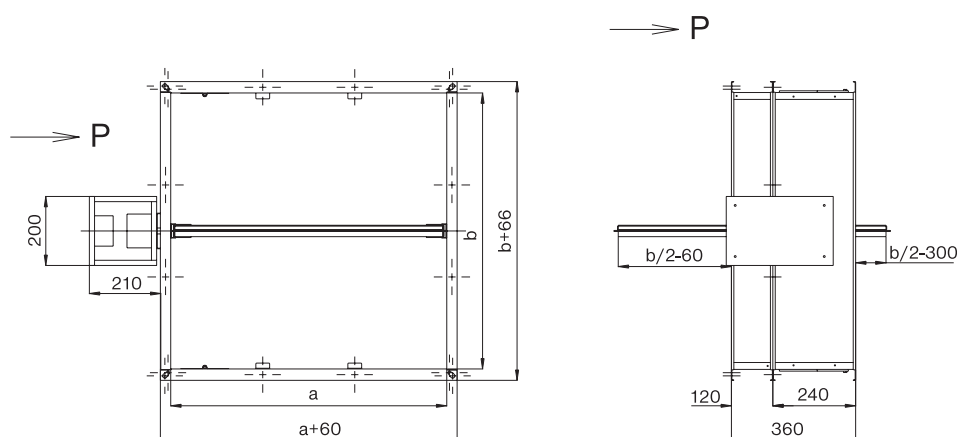
## Main functional parts of the damper



**Leaf detail**

- |                            |                                    |
|----------------------------|------------------------------------|
| 1- damper casing           | 7- control unit                    |
| 2- damper leaf             | 8- protection cover of servo drive |
| 3- foaming anti-fire paste | 9- passive sealing                 |
| 4- inspection opening lid  | 10- passive sealing                |
| 5- servodrive holder       | 11- active anti-fire sealing       |
| 6- servo drive             |                                    |

*Fig.1 Smoke damper DKI- I- main functional parts*



*Fig.2 Basic dimensions of DKI-I*

## Damper description

DKI-I damper casing consists of two parts made of zinc-plated sheet. These two parts are connected together with flange connection, which is secured with foaming anti-fire paste. Damper leaf is made of calcium-silicate non-asbestos boards. Closed damper is sealed against passing of burning emissions (hot air and smoke up to 600°C) through active anti-fire sealing and is tight in common conditions (at under pressure  $p=500 \text{ Pa}$   $\Rightarrow$  leakage is to  $200 \text{ m}^3/(\text{h} \cdot \text{m}^2)$ ). For damper DKI-I connection to ventilation duct serve flanges, situated at the ends of damper casing (for better tightness of the whole system, manufacturer recommends to use anti-fire paste in the place of damper flange connection with the duct flange. Damper opening is solved with servo-drive situated on the damper casing, which is protected against direct heat impact.

## Damper usage

Damper DKI-I for emission outlet is a part of system used for exhaust of smoke and heat. The system helps to keep the exits without smoke and it simplifies the job of fire brigades- slower the spread of fire. This system is created in larger buildings, where the size and shape of the building do not enable natural smoke exhaust when fire. The damper can be mounted (as a terminal element) on the surface of ventilation duct for one fire area (according to EN 1366-9) both in vertical and horizontal direction in a way that the more narrow part of the damper (that part of the damper where the damper leaf is embedded) was connected by the flange with the ventilation duct. Next the damper can be used as a component part of the ventilation duct for one fire area (according to EN 1366-9), also both in vertical or horizontal direction. According to STN EN 60 079-10 (33 2320) are the dampers assigned for environment without the danger of explosion (BNV) and for ordinary environment according to STN 33 0300, the highest is level 3 (C3) of atmosphere corrosion aggressiveness (medium corrosion aggressiveness).

## Damper operation

The damper is operated by servo drive, which is based on electrical impulse from smoke- box, or remote-controlled, with help of electric fire signalization central. Based on such a signal, the damper leaf opens or closes according to the smoke and heat exhaust system's need. Servo drive closes or opens the damper within 60 seconds and the damper stays in function at the temperature 110 °C (damper leaf can open or close).

At the temperature up to 600°C is the integrity and tightness of closed damper 120 minutes according to the classification standard EN 13 501- 4 E<sub>600S</sub> 120 SINGLE ve(d), ho(d) 500AA  $\Rightarrow$   $c_{10\ 000}$ (SINGLE- for one fire area, ve(d), ho(d)- installation on the surface also as a component part of vertical and horizontal ventilation duct, 500-max. under pressure 500 Pa, AA- automatic activation,  $\Rightarrow$  thermal strain caused by the fire from the inside and outside of the damper,  $c_{10\ 000}$  – number of cycles- openings, closures of the damper).

## Working conditions

Damper equipped with servo drive can be placed in the space, where the operation temperatures are from -10°C to 110°C. Active anti-fire insulation cannot be exposed to direct contact with water. Maximum air flow velocity is 12m.s<sup>-1</sup>. It is necessary to discuss the requirements for special damper manufactures with the producer and indicate them in order.

## Damper manufacture

The producer delivers basic damper version with servo drive (see electrical elements, schemes for connecting in technical conditions).

A servo drive for nominal voltage 230V/ 50 Hz or 24V/ 60Hz and DC 24V can be used. The producer assigns separate types with stated minimum rotation torque to relevant damper size following:

Nominal dimension area  $S \leq 0.8 \text{ m}^2 \Rightarrow 15 \text{ Nm}$

Nominal dimension area  $S \leq 0.8 \text{ m}^2 \Rightarrow 40 \text{ Nm}$

## Damper material

In basic version are all the metal parts of the damper zinc-plated, damper casing is made of zinc-plated sheet, damper leaf is made of calcium-silicate asbestos-free plates. Damper leaf is secured with anti-smoke sealing and foaming laminate fireproof sealing.

## Surface finishing

On damper basic version are all the metal parts with zinc-plated surface with layers width 15 and 20 µm. Any other surface finish can be done in range of special version upon discussion with the producer.

## Technical Conditions

### Main dimensions and weights

Main dimensions and weights of dampers are stated in enclosed tables. Weights refer to basic damper versions with servo drive. Producer stated separate damper nominal dimensions according to the dimensions of square duct STN EN 1505.

Upon an agreement with the purchaser the producer can deliver dampers in dimensional range from 200x200 to 1500x 800, in this case classification E<sub>600</sub>S 120 is valid. With dampers from the dimension 1500x 800 with the cross- section up to 1,5m<sup>2</sup> classification E<sub>600</sub> S 90 is valid.

Table 1 – Dimensions and weights in kg for DKI-I

		b (mm)									
		200	250	300	350	400	450	500	600	700	800
a (mm)	200	12.2									
	250	12.8	13.5								
	300	13.6	14.4	15.5							
	350	14.1	15.0	16.1	16.8						
	400	14.7	15.6	16.9	17.7	18.5					
	450		16.3	17.9	18.4	19.5	20.5				
	500		17.0	18.5	19.4	20.4	21.6	22.7			
	600			20.6	21.7	22.9	24.3	25.7	27.3	29.2	
	700				23.1	24.5	26.0	27.5	29.3	32.5	
	800					26.2	27.8	29.5	33.0	36.4	39.4
	900						29.9	31.7	35.2	39.4	42.7
	1000							34.0	37.9	42.4	46.0
	1100							38.2	42.1	45.9	49.9
	1200								46.0	49.9	54.3
	1300								48.0	52.0	56.7
	1400									54.4	59.3
	1500									57.4	62.5

### Product ordering

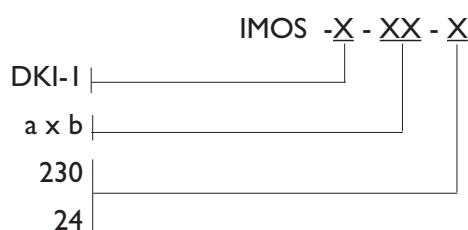
It is necessary to indicate damper indication, number of pieces ordered

#### Designation

Damper

Nominal dimensions

Manufacture (damper version)



Example of ordering damper with dimensions 200x200, for nominal voltage 230V/50Hz:

IMOS-DKI-I-200x200-230

I piece TPI 52-07

#### About the product:

Every damper casing is labeled with sticker with following information

- a) Product name
- b) Version, dimension
- c) Classification
- d) Certificate number
- e) Product conformity number

f) Series number

g) Name and address of the producer

h) Year of manufacture

#### Spare parts delivered upon order

It is possible to deliver spare parts upon a discussion with the producer.

## Damper design and manufacture

### Stating the damper pressure losses

Damper pressure losses are stated by calculation. Coefficients of local pressure loss that refer to nominal damper cross-section  $a \times b$  or cross-section corresponding  $\phi d$  are stated in the table no.2 Pressure loss for particular damper is stated by calculation with the formula:

$$P_z = \zeta v_L^2 / 2 \cdot \rho$$

$\rho_z$ - pressure loss

$\zeta$ - coefficient of resistance

$v_L$ - flow velocity in nominal cross-section  $a \times b$  or cross-section referring to  $\phi d$  [m.s<sup>-1</sup>]

$\rho$ - air consistency [kg.m<sup>-3</sup>] (1,23 kg.m<sup>-3</sup>)

Tab.le 2 Coefficient of resistance for dampers DKI-I

		b (mm)									
		200	250	300	350	400	450	500	600	700	800
a (mm)	200	1.39									
	250	1.31	1.19								
	300	1.24	1.14	0.99							
	350	1.20	1.12	0.97	0.91						
	400	1.16	1.08	0.94	0.88	0.82					
	450		1.05	0.92	0.86	0.80	0.74				
	500		1.02	0.89	0.83	0.78	0.72	0.68			
	600			0.82	0.77	0.73	0.67	0.64	0.54	0.50	
	700				0.73	0.70	0.65	0.62	0.53	0.49	
	800					0.66	0.61	0.59	0.51	0.47	0.44
	900						0.56	0.57	0.49	0.45	0.42
	1000							0.54	0.47	0.43	0.40
	1100							0.53	0.45	0.42	0.38
	1200								0.43	0.41	0.36
	1300								0.4	0.41	0.35
	1400									0.4	0.34
	1500									0.39	0.32

### Damper embedding

Dampers DKI-I embedding is always designated by the particular ventilation project, which must verify valid standards.

Damper distances from building constructions, technological distributors and ventilation devices must be such that the authorized mounting people could be able to do the mounting, functional tests, revisions, maintenance and services. Between the damper and the wall or ceiling must be distance minimum 200 mm.

### Examples of damper embedding

- on the surface of ventilation duct- EN 1366-9 in horizontal or vertical direction, in a way that the more narrow part of damper casing ( damper part where the damper leaf is embedded) was by the flange connected to ventilation duct.
- as a part of ventilation duct- EN 1366-9 both in vertical or horizontal direction.

## Damper embeddings

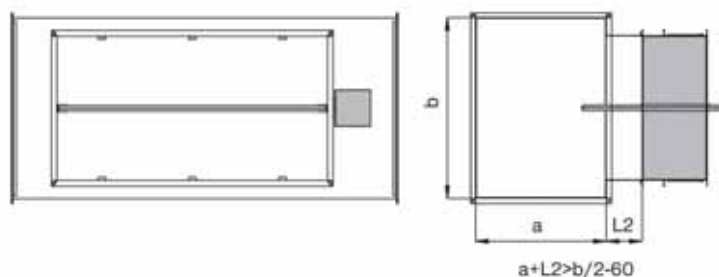


Fig.3 Horizontal damper fitting on the duct- EN 1366-9

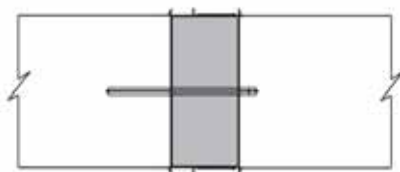


Fig.4 Horizontal damper fitting in the duct- EN 1366-9

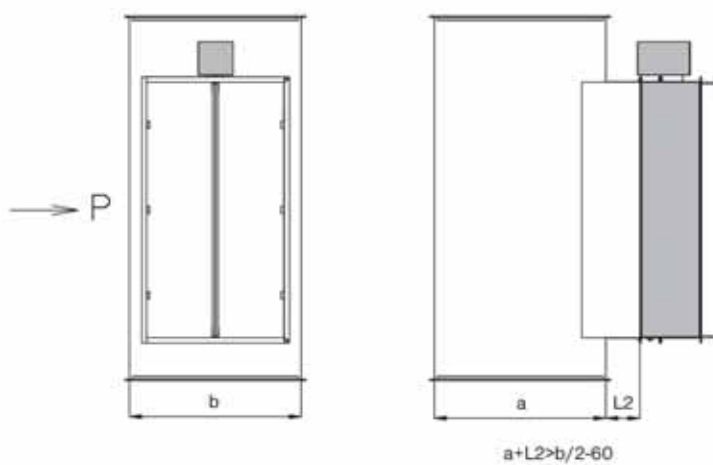


Fig.5 Vertical damper fitting on the duct-EN 1366-9

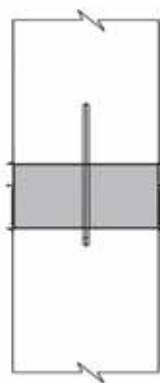
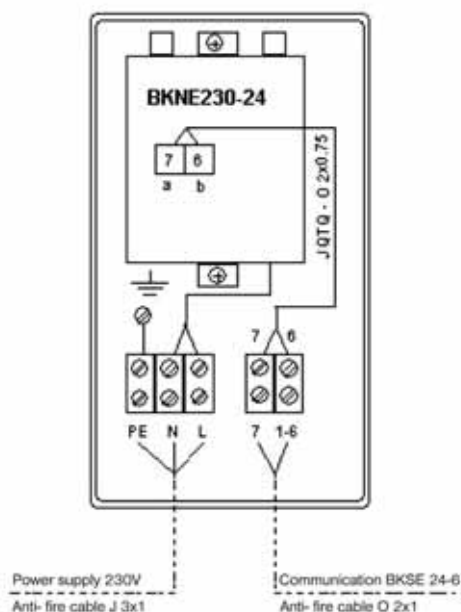


Fig.6 Vertical damper fitting in the duct- EN 1366-9



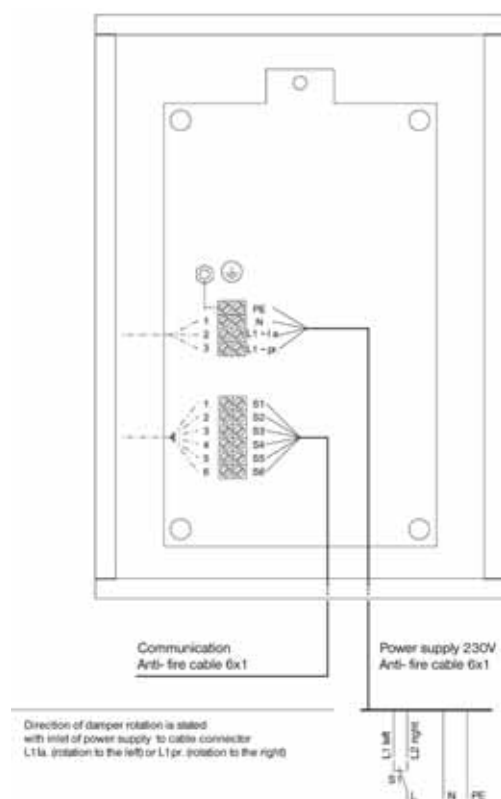
## Electrical elements, schemes of connecting

### Scheme of connecting the smoke damper (with servo drive for 24V and control unit BKNE 230-24) to electro-installation.



- for power supply 230V- use anti-fire cable J 3xI with fire resistance min. EI 30
- for communication with BKSE 24-6- use anti-fire cable O 2xI with fire resistance min. EI30
- every smoke damper (with servo drive for 24V) must be connected to central unit BELIMO BKSE 24-6, to one central unit it is possible to connect minimum one and maximum 6 smoke dampers

### Scheme of connecting smoke damper (with servo drive for 230V) to electro- installation



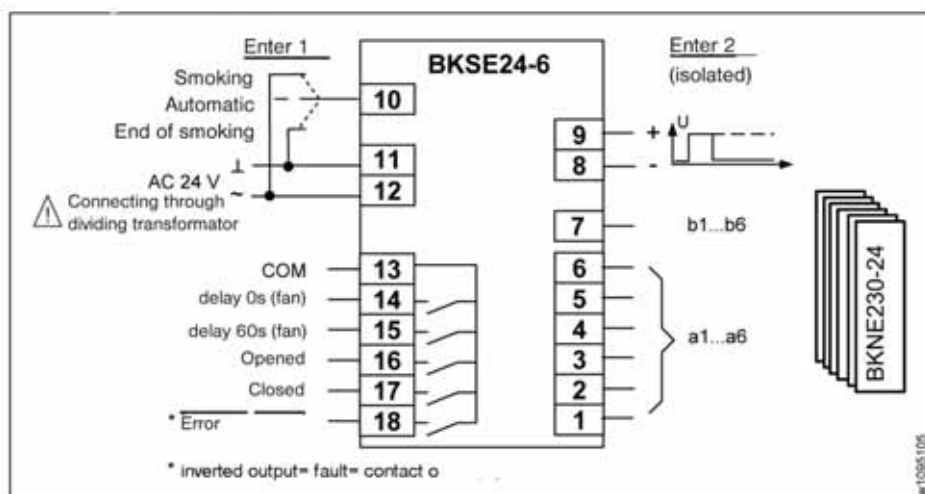
Direction of damper rotation is stated with inlet of power supply to cable connector L1la. (rotation to the left) or L1pr. (rotation to the right)

- for power supply 230V- use anti-fire cable J 4xI with fire resistance min. EI 30
- for communication with BKSE 24-6- use anti-fire cable O 6xI with fire resistance min. EI 30

## Scheme of connecting the central unit BKSE 24-6 to control unit BKNE 230-24

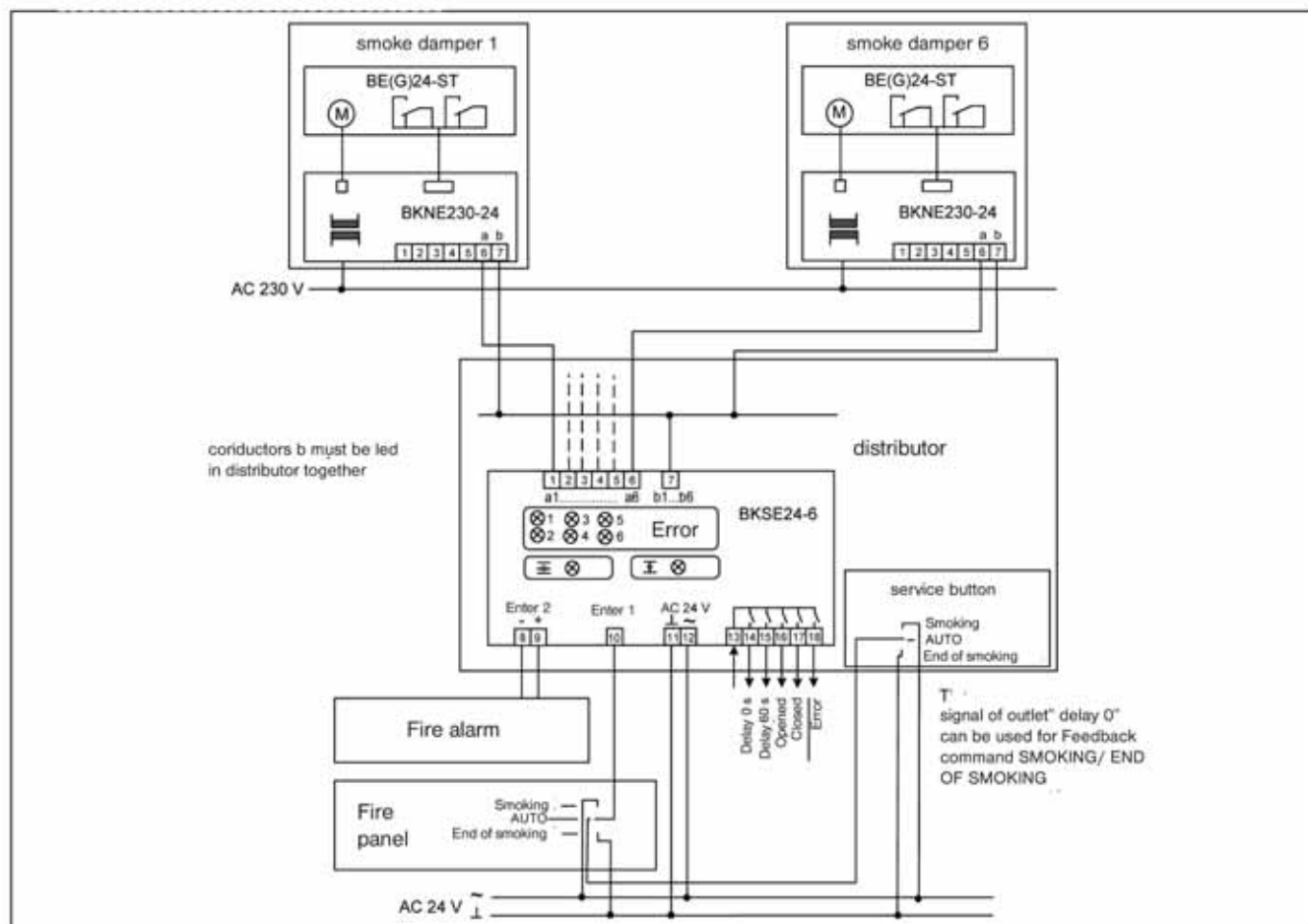


- 1- upholding clasp
- 2- description (zone)
- 3- description (damper)
- 4- LED diode red (failure)
- 5- Button PRG
- 6- LED diode yellow(damper position: OPENED)
- 7- LED diode yellow (damper position: CLOSED)
- 8- Button SET/ INIT
- 9- Screwing terminals

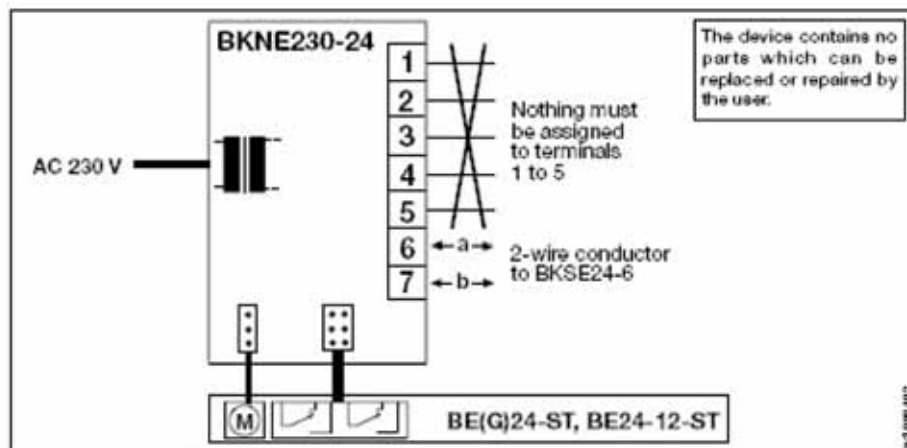


Technical data	BKSE 24-6
Nominal voltage	AC24V 50/60 Hz
Power consumption	ACI9.2 – 28.8V
For wire sizing	5.5 VA ( $I_{max}$ 6.4A @ 2.5 ms)
Control signals	
• Input 1 (Priority 1)	<ul style="list-style-type: none"> <li>- extract</li> <li>- cease</li> <li>- Auto</li> <li>- signal duration</li> <li>- input impedance</li> </ul>
• Input 2 (Priority 2)	<ul style="list-style-type: none"> <li>- input level DC</li> <li>- input current DC</li> <li>- input level AC</li> <li>- input current AC</li> <li>- signal duration</li> </ul>
Connections	terminals for wire 2 x 1.5 mm <sup>2</sup>
Conductor lengths	
- 2 wire conductor a/b	max. 600 m (wire 0.75 mm <sup>2</sup> )
- control input	max. 600 m (wire 0.75 mm <sup>2</sup> )
Recommended cable	fire alarm signal cable 2 x 0.8 mm <sup>2</sup>
Type	JE-H (St) Bd FE 180/E30-E90
Auxiliary contacts	AC24V@ 0.5 A
Protection class	III safety extra - low voltage
Degree of protection	IP20
Mode of operation	type I (EN 60730)
EMV low-voltage directive	CE according to 89/336/EWG, 92/31/EWG, 93/68/EWG
Maintenance	maintenance-free
Weight	160 g

## Scheme of principle of BKSE 24-6 (example)











## Scheme of connecting BKNE 230-24



- 1- connecting the net AC 230V
- 2- connecting the plug for drive Belimo 24V
- 3- terminal 7-pole
- 4- cable lead through for drive Belimo
- 5- cable lead through for conductor 2
- 6- LED cursor green ( damper position: closed)
- 7- LED cursor yellow ( damper position: opened)

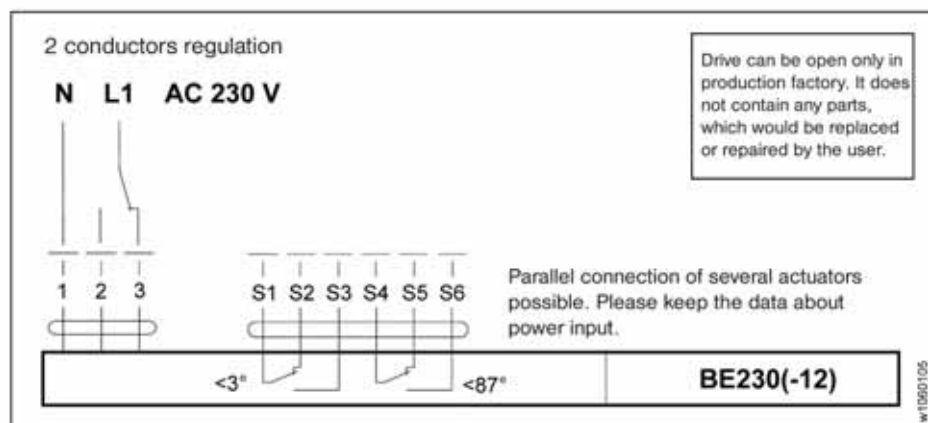
### Displays

LED	Status	Function
yellow 	flashing light	damper moving to OPEN
yellow 	steady light	damper open
green 	flashing light	damper moving to CLOSED
green 	steady light	damper closed
yellow  or green 	flashing at double frequency	fault
yellow  + green 	dark	power failure

Technical data	BKNE 230-24
Nominal voltage	AC230V 50/60 Hz
Nominal voltage range	AC198 – 264V
For wire sizing	19 VA (with actuator)
Power consumption	10 W (with actuator)
Connections	
- mains	lead 1 m (halogen-free), without plug
- actuator	6 pin plug, 3 pin plug
- *2 wire connector	screw terminals for wire 2 x 1.5 mm
*Recommended cable	JE-H (St) Bd FE 180/E30-E90
Protection class	II (all-insulated)
Ambient temperature range	IP42
Degree of protection	
- normal operation	-30° – +50°C
- safety function	see text/graph Safety function
Non-operating temperature	-40° – +80°C
EMV low-voltage directive	CE according to 89/336/EWG, 92/31/EWG, 93/68/EWG
Software class	A (EN 60730)
Mode of operation	type I (EN 60730)
Maintenance	maintenance-free
Weight	680 g

## Scheme of connecting servo drive

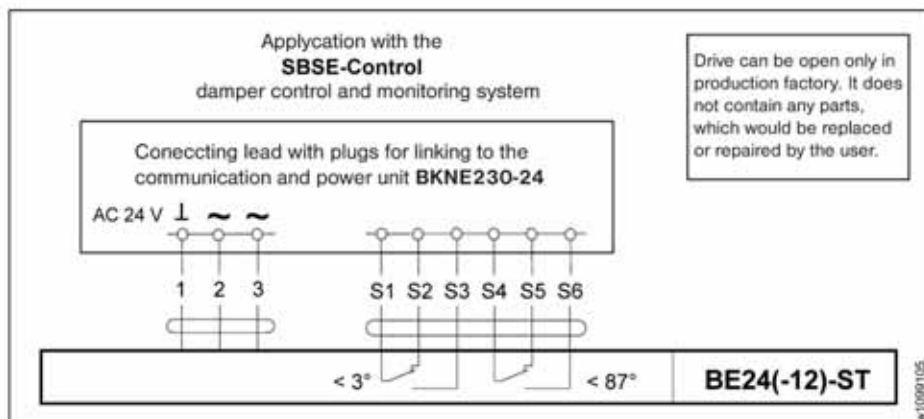
Belimo BE 230-I2



Technical data	BE 230, BE 230-I2
Nominal voltage	AC230V 50/60 Hz
Nominal voltage range	AC198 – 264 V
For wire sizing	15 VA (Imax. 7.9A @ 5 ms)
Power consumption	
- motoring	8W
- holding	0,5W
Connection cable	
- motor	lead 1 m, 3 x 0.75 mm <sup>2</sup> (halogen-free)
- auxiliary switch	lead 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)
Auxiliary switch	2x EPU 6(3)A, AC 250V □
- switching points	3°/87° (referred to 0 –90°)
- tolerance	±2°
Angle of rotation	100° (incl. 5° mechanical overrun on each side)
Torque (nominal torque)	40 Nm
Blocking torque	
- dynamic	40 Nm
- steady-state	50 Nm
Direction of rotation	Selected by mounting L/R
Damper stem	form-fit 14x14mm form-fit 12x12 mm
Running time	<60s for 90°
Sound power level	max. 62dB(A)
Service life	At least 10'000 cycles
Position indication	Mechanical with pointer
Protection class	II (totally insulated)
Degree of protection	IP54
Ambient temperature range	
- normal duty	-30° – +50°C
- crash case	see text/graph crash case
Non-operating temperature	-40 ... +80°C
Ambient humidity range	According to EN 60335-1
Mode of operation	type I.C (EN 60730)
EMV low-voltage directive	CE according to 89/336/EEG, 92/31/EEG, 93/68/EEG
Maintenance	maintenance-free
Weight	appr. 2.7 kg

## Scheme of connecting servo drive

Belimo BE 24-12ST

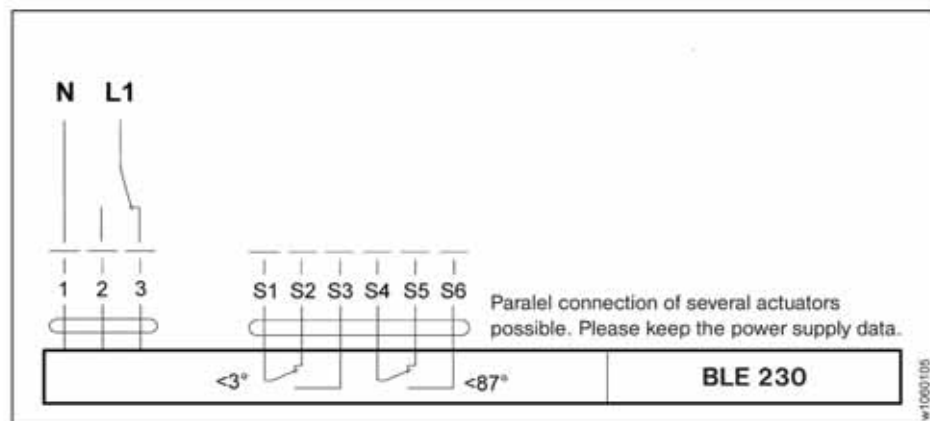


Technical data	BE 24-ST, BE24-12-ST
Nominal voltage	AC24V 50/60 Hz DC 24V
Nominal voltage range	AC19.2 ... 28.8V
For wire sizing	18 VA (I <sub>max.</sub> 8.2A @ 5 ms)
Power consumption	
- motoring	12W
- holding	0,5W
Connection cable	
- motor	lead 1 m, 3 x 0.75 mm <sup>2</sup> (halogen-free), with 3-pole plug connectors
- auxiliary switch	lead 1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free), with 6-pole plug connectors
Auxiliary switch	2 x EPU □
Contact rating (contacts gold plate on silver)	1 mA ... 6 A, DC 5V ... AC 250V
Switching points	3° / 87° (referred to 0 ... 90°)
Tolerance	±2°
Angle of rotation	100° (incl. 5° mechanical overrun on each side)
Torque (nominal torque)	40 Nm
Blocking torque	
-dynamic	40 Nm
- steady-state	50 Nm
Direction of rotation	Selected by mounting L/R
Damper stem	form-fit 14x14mm, form-fit 12x12mm
Running time	<60 s for 90°
Sound power level	Max. 62 dB (A)
Position indication	Mechanical with pointer
Service life	At least 10'000 cycles
Protection class	III Safety extra-low voltage
Degree of protection	IP54
Ambient temperature range	
-normal duty	-30 ... +50°C
-safety duty	see text/ graph crash case
Non-operating temperature	-40 ... +80°C
Ambient humidity range	CE according to 89/ 336/EWG, 92/31/EWG, 93/68/EWG
Mode of operation	type I.C (EN 607 30)
EMV low-voltage directive	CE according to 89/ 336/EWG, 92/31/EWG, 93/68/EWG
Maintenance	maintenance- free
Weight	appr. 2,7 kg



## Scheme of connecting servo drive

Belimo BLE-230



Technical data	BE 230
Nominal voltage	AC230V 50/60 Hz
Nominal voltage range	AC198V ... 264 V
Switching thresholds min. ON voltage	AC198V
Switching thresholds max. OFF voltage	AC100V
Power consumption	
- motoring	4W @ menovity moment
- holding	0,5W
- For wire sizing	10VA/ I <sub>max</sub> 7.9A @ 5ms
Auxiliary switch	2 x EPU <input type="checkbox"/>
Contact rating (contacts gold plate on silver)	1 mA ... 6 A, DC 5 V ... AC 250 V <input type="checkbox"/>
Switching points	3° / 87° (referred to 0 ... 90°)
Tolerance	±2°
Connecting cable	
Motor	lead I m 3x0.75 mm <sup>2</sup> (hallogen-free)
Auxiliary switch	lead I m 6x0.75 mm <sup>2</sup> (hallogen-free)
Functional data	
Blocking torque dynamic	15 Nm
Blocking torque steady state	30 Nm
Torque (nominal torque)	15 Nm
Direction of rotation	Selected by mounting L/R
Angle of rotation	Max. 105° (incl. 5° mechanical overrun on each side)
Running time	<30 s for 90°
Sound power level	Max. 60 dB (A)
Damper stem	12mm
Position indication	Mechanical with pointer
Service life	At least 10'000 cycles
Safety	
Protection class	II-totally insulated
Degree of protection	IP54 all mounting positions
Electromagnetic compability CRM	CE according to 89/ 336/EWG, 92/31/EWG,93/68/EWG
Low voltage directive	CE according to 72/ 23/EWG
Mode of operation	Type I.B (according to STN EN 60730-1)
Rated impulse voltage	4 kV ( according to STN EN 60730-1)
Control pollution degree	3 ( according to STN EN 60730-1)
Ambient temperature range	
-normal duty	-30 ... +50°C
Non-operating temperature	-40 ... +80°C
Ambient humidity	95% r.H. non-condensating(according to EN 60 730-1)
Maintenance	maintenance-free
Dimensions	see "Dimensions" on page 4
Weight	appr. 1680 g

**Safety notes:**

Servo drive is assigned for use only based on above specified parameters. Be careful with power supply! Adjusting, mounting, and getting the drive to operation are allowed only for damper producer. Delivery of servo drives is from this reason carried out directly from the servo drive producer to damper producer. Damper producer is responsible for safe and reliable damper operation. Dampers with servo drive must be certified according to STN EN 1366-1. Servo drive can be opened and repaired only by the producer. Servo drive contains electronic and electric components.

**Regulation**

Open-Close AC 250 V

2-wire open-close control. The actuator is overload-proof and can thus remain energized even at the end stops.

**Signaling**

Two micro switches with fixed settings are installed in the actuator for indicating the damper end positions. The position of the damper blade can be read off on a mechanical position indicator.

**Manual operation**

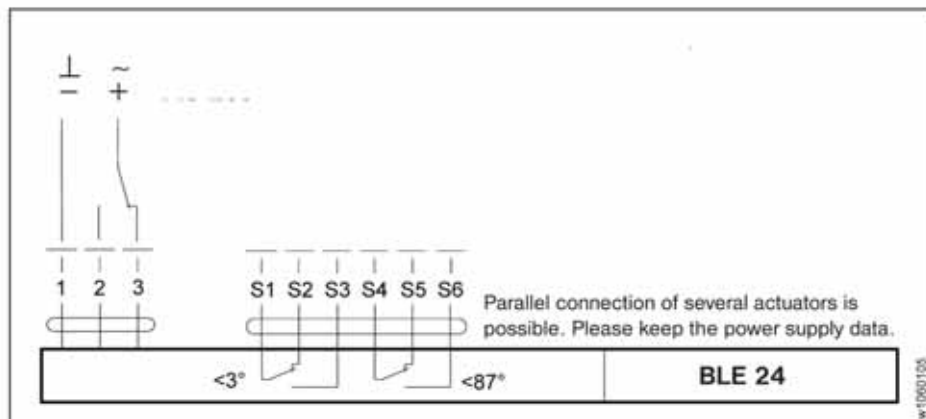
The crank handle supplied with the actuator allows it to be operated manually.

**Important note**

The producer must have the damper certified according to STN EN 1366-10.

## Servo drive for actuation of smoke dampers with rotation angle 90- 24V.

Belimo BLE-24



Technical data	BLE24
Electrical data	
Nominal voltage	AC24V 50/60 Hz /DC 24V
Nominal voltage range	AC19.2V ... 28.8V /DC 21.6V ... 28.8V
Switching thresholds min. ON voltage	AC19.2V /DC 21.6V
Switching thresholds max. OFF voltage	AC6.5V /DC6.5V
Power consumption	
- motoring	4W @ menovity moment
- holding	0,5W
For wire sizing	10VA/ I <sub>max</sub> 7.9A @ 5ms
Auxiliary switch	2 x EPU
Contact rating (contacts gold plate on silver)	1 mA ... 6A, DC 5V ...AC 250V
Switching points	3° / 87° (referred to 0 ... 90°)
Tolerance	±2°
Connecting cable	
Motor	lead 1 m 3x0.75 mm <sup>2</sup> (hallogen-free)
Auxiliary switch	lead 1 m 6x0.75 mm <sup>2</sup> (hallogen-free)
Functional data	
Blocking torque dynamic	15 Nm
Blocking torque steady state	30 Nm
Torque (nominal torque)	min. 15 Nm @ nominal voltage
Direction of rotation	Selected by mounting L/R
Angle of rotation	Max. 105° (incl. mechanical overrun on each side)
Running time	<30 s for 90°
Sound power level	Max. 62 dB(A)
Damper stem	12mm
Position indication	Mechanical with pointer
Service life	At least 10'000 cycles
Safety	
Protection class	III-safety extra-low voltage
Degree of protection	IP54 all mounting positions
Electromagnetic compability CRM	CE according to 89/ 336/EWG, 92/31/EWG,93/68/EWG
Low voltage directive	CE according to 72/ 23/EWG
Mode of operation	Type I.B (according to STN EN 60730-I)
Rated impulse voltage	0.8 kV ( according to STN 60730-I)
Control pollution degree	3 ( according to STN EN 60730-I)
Ambient temperature range	
-normal duty	-30 ... +50°C
Non-operating temperature	-40 ... +80°C
Ambient humidity	95% r.H. non-condensating(according to EN 60 730-I)
Maintenance	maintenance-free
Weight	appr. 1680 g

**Regulation: Open- Close AC/ DC 24V**

Switching with help of 1-pole contact relay, 1-wire regulation

**Signalling**

Two microswitches with fixed settings are installed in the actuator for indicating the damper end positions.

The position of the damper blade can be read off on a mechanical position indicator.

**Manual operation**

The crank handle supplied with the actuator allows it to be operated manually.

**Important note:**

The producer must have the damper with servo drive certified according to STN EN 1366-10.

Cables of servo drives with connectors are connected to communication and regulation device BKNE 230-24. The device BKNE 230-24 is installed in near distance.

**Checking, testing, warranty**

Quality completeness check is provided at the producer. Every damper function is tested by the producer. Product parameters are validated according to testing rule and acceptance is provided according to valid instructions in the company Systemair, s.r.o. Damper is delivered as assembled. Producer provides 24 months warranty from the dispatch date for the dampers DKI-I.

**Mounting, operation, maintenance**

Mounting, operation and maintenance of dampers is subject to specific "Operation guidelines" published by the manufacturer and is attached to every product when delivered.

**Packaging, transport, storage****Packaging**

Individual dampers are delivered wrapped. Upon customer's request, dampers can be delivered on pallets. The customer is required to deliver such cover to a waste disposal or recycling facility at his expense.

**Transportation**

Transportation to the customer is organized with the use of ordinary means of transport and the cost is also to be borne by the customer. By transportation dampers must be protected against damage and weather conditions.

**Storage**

It is recommended that the dampers are kept in closed and dry place. While storing, it is needed to protect the dampers from mechanical damage and from pollution. Dampers in standard version can be stored in temperature ranging -10 to 50°C. Damper versions with electromagnet or other electric elements can be stored pursuant to standard STN 35 0005 in temperature range of -10° a. 40°C.

**Reports of testing**

Numbers of protocols about the tests that have been done are stated in product conformity and completeness confirmation, attached to every damper.

## Appendix

Any deviations from the present technical specifications are subject to agreement with the manufacturer. The manufacturer hereby reserves the right to technical innovations without prior notice to customers and holders of this TPI( technical conditions).

### Related standards

STN 73 0802	Fire safety of buildings. Common statements
STN EN 1634-1	Fire safety of buildings. Determination of fire resistance of fire closures
STN 73 0862	Fire safety of buildings. Determination of the level of building substance flammability.
STN 73 0872	Fire safety of buildings. protection of buildings against fire expansion via ventilation and air conditioning device.
STN 92 0201-1 az 4	Fire safety of buildings. Common statements.
STN CR 12792 (12 0001)	Ventilation of buildings. Symbols and terminology.
STN EN 1505	Ventilation of buildings. Metal sheet pipes and shaped pieces of square cross section. Dimensions.
STN EN 1506	Ventilation of buildings. Metal sheet pipes and shaped pieces of circular cross section. Dimensions.
STN ISO 9223 03 8203	Corrosion of metals. Classification of corrosive aggression atmosphere.
STN 33 0300	Electronic regulations. Types of environment for electronic devices.
STN 33 2030	Protection against hazardous effects of static electricity.
STN EN 60079-10	Electric devices for explosive gas atmosphere, part 10: determining explosion hazardous areas.
STN 92 0101	Fire safety of buildings. Terminology.
STN 92 0102	Fire safety of buildings. Values and signs.
STN EN 1634-3	Testing fire resistance of sets of doors and closures. Part 3. Doors and closures sealed against smoke expansion.





Systemair AB • SE-739 30 Skinnskatteberg, Sweden  
Tel +46 222 440 00 • Fax +46 222 440 99  
[mailbox@systemair.se](mailto:mailbox@systemair.se) • [www.systemair.com](http://www.systemair.com)

