Doc. no. : 301-24-001

DiEM

The Art of Ventilation

Soler&Palau Ventilation Group

ZPP

Multi-blade fire damper

ZPP

MULTI-BLADE FIRE DAMPER

Product characteristics

A multi-blade fire damper for general ventilation systems, with an electric spring return actuator.

Intended use

The ZPP multi-blade fire damper is designed for application in general ventilation systems as cut-off partition separating the fire-engulfed zone from the remaining part of the building (normally open). The purpose of this damper is to prevent the spread of fire, heat and smoke. The ZPP damper may also be used for a transfer function.

The ZPP dampers are designed, manufactured and tested in accordance with the following standards: PN-EN 15650 "Ventilation for buildings – Fire dampers" and PN-EN 13501- 3 "Fire classification of construction products and building elements – Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers."

The effectiveness of the dampers is confirmed by tests according to PN-EN 1366-2 "Fire resistance tests for service installations – Part 2: Fire dampers."

The ZPP fire damper is classified as tightness class C (housing tightness) on the basis of tests carried out according to PN-EN 1751 "Ventilation for buildings. Air terminal devices. Aerodynamic testing of dampers and valves."

Classification

The ZPP fire dampers are classified according to fire resistance classes and can be installed in building partitions as listed below:

EI 120 (v_e h_o i↔o) S

Horizontal blades, rigid walls with low density (650 ± 200 kg/m^3) or higher, 125 mm in thickness or more, and EI120 or a higher fire resistance class (e.g. concrete walls, solid brick walls, cellular concrete block walls, hollow masonry unit walls or concrete slab walls)

EI 90 (v_e i↔o) S, EI 120 (v_e i↔o) S

Horizontal or vertical blades, rigid walls with low density (650 ± 200 kg/m^3) or higher, 120 mm in thickness or more, and EI90 or a higher fire resistance class (horizontal or vertical blades), EI120 or higher (horizontal blades) (e.g. concrete walls, solid brick walls, cellular concrete block walls, hollow masonry unit walls or concrete slab walls)

EI 120 (v_e o→i) S

Horizontal blades, Standard flexible walls, 125 mm in thickness or more and EI 120 or a higher fire resistance class.

Description

The ZPP dampers are made up of a rectangular housing, movable blades and a drive system.

The dampers' housing is made of fire-rated boards and steel structural members. Both sides of the housing are equipped with steel connection spigots, which enable easy connection of a duct.

Movable blades, made of mineral silicate composite, are fastened to the housing by means of metal pins.

There are intumescent seals mounted on the inner side of the housing and on the blades. Their characteristic feature is the volume increase at high temperatures, tightly filling all leaks between the baffle and the body. A bubble seal ensures the leak tightness at ambient temperature.

The ZPP damper is provided with an innovative actuating mechanism, which ensures the counter rotation of the blades. The mechanism is made up of, among other things, gears made of fire-rated materials, blades and an electric actuator.

During normal operation of the system, the blades are in the open position.

The permissible air velocity for the ZPP damper in a BxH connection duct is 12 m/s.

The ZPP damper is equipped with an electric spring return actuator of BF or BFN series by BELIMO and a BAT or BAE thermal fuse (72 ° C) (optionally 95 ° C), which is the damper's drive system with AC 230 V or AC / DC 24V

Where:

E – fire integrity

I – fire insulation

S – smoke leakage

v_e – damper installed directly in a **wall**

h_o – damper installed directly in a **floor**

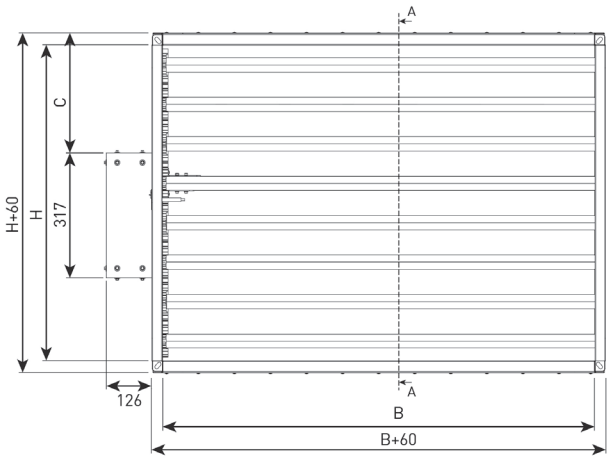
i↔o – operating effectiveness criteria are met from inside to outside (fire inside), and from outside to inside (fire outside).

90/120 – duration of fulfilment of E, I and S criteria in minutes.

Manufacturing versions

The range of dampers covers the following dimensions: a clear damper width from 200 to 1200 mm (10 mm intervals) and a clear damper height from 200 to 800 mm (100 mm intervals). The basic range of damper sizes along with the actuators used is presented in the table below.

Dimensions



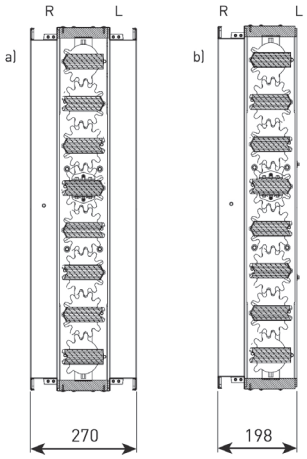


Figure 1. Dimensions of the ZPP damper:
a) ZPP-K, b) ZPP-KR (with a spigot on the R-side).

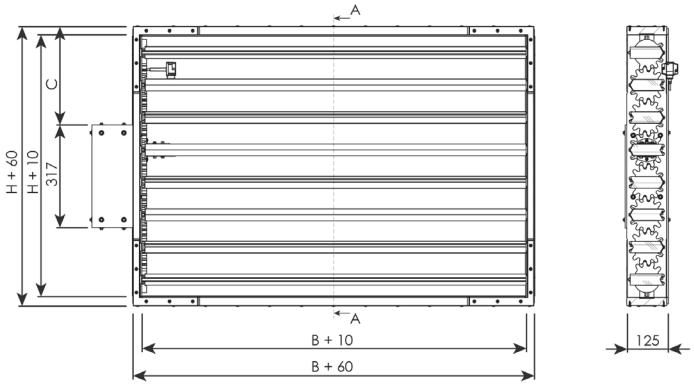


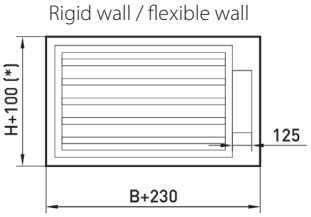
Figure 1. Dimensions of the ZPP-T damper.

Where:
B – damper clear width (min.200 max 1200 mm)
H – damper clear height (min. 200 max 800 mm)
N – number of blades
C – as indicated in the table

Table 1. Dimensions of the ZPP damper.

N	H [mm]	C [mm]
2	200	0
3	300	100
4	400	100
5	500	200
6	600	200
7	700	300
8	800	300

Installation



Permissible range:
B + (210 ÷ 250) mm / H + (80 ÷ 120) mm*

*For dampers with a height of H = 200 mm and H = 300 mm, the installation opening should be H + 160 mm high (permissible range H + (140 ÷ 180) mm)

Figure 3. Openings required for the ZPP.

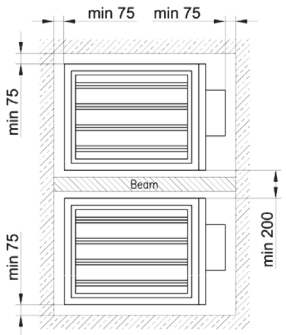


Figure 4. Spacing required between the dampers.

Technical data

Table 2. The net surface area and the range of actuators used for the ZPP dampers.

LPP		Width B [mm]																				
		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
Height H [mm]	200	0,026	0,033	0,039	0,046	0,052	0,059	0,065	0,072	0,078	0,085	0,091	0,098	0,104	0,111	0,117	0,124	0,130	0,137	0,143	0,150	0,156
	300	0,039	0,049	0,059	0,068	0,078	0,088	0,098	0,107	0,117	0,127	0,137	0,146	0,156	0,166	0,176	0,185	0,195	0,205	0,215	0,224	0,234
	400	0,052	0,065	0,078	0,091	0,104	0,117	0,130	0,143	0,156	0,169	0,182	0,195	0,208	0,221	0,234	0,247	0,260	0,273	0,286	0,299	0,312
	500	0,065	0,081	0,098	0,114	0,130	0,146	0,163	0,179	0,195	0,211	0,228	0,244	0,260	0,276	0,293	0,309	0,325	0,341	0,358	0,374	0,390
	600	0,078	0,098	0,117	0,137	0,156	0,176	0,195	0,215	0,234	0,254	0,273	0,293	0,312	0,332	0,351	0,371	0,390	0,410	0,429	0,449	0,468
	700	0,091	0,114	0,137	0,159	0,182	0,205	0,228	0,250	0,273	0,296	0,319	0,341	0,364	0,387	0,410	0,432	0,455	0,478	0,501	0,523	0,546
	800	0,104	0,130	0,156	0,182	0,208	0,234	0,260	0,286	0,312	0,338	0,364	0,390	0,416	0,442	0,468	0,494	0,520	0,546	0,572	0,598	0,624

BFN actuator (BxH≤0,40m²)

BF actuator (BxH>0,40m²)

Table 3. Pressure drop on ZPP damper, Δp [Pa].

ZPP		v [m/s]	Width B [mm]										
			200	300	400	500	600	700	800	900	1000	1100	1200
Height H [mm]	200	4	13	13	13	13	13	13	13	13	13	13	13
		6	29	29	29	29	29	29	29	29	29	29	29
		8	50	50	50	50	50	50	50	50	50	50	50
		10	79	79	79	79	79	79	79	79	79	79	79
	300	4	13	13	13	13	13	13	13	13	13	13	13
		6	27	27	27	27	27	27	27	27	27	27	27
		8	51	51	51	51	51	51	51	51	51	51	51
		10	81	81	81	81	81	81	81	81	81	81	81
	400	4	12	12	12	12	12	12	12	12	12	12	12
		6	26	26	26	26	26	26	26	26	26	26	26
		8	49	49	49	49	49	49	49	49	49	49	49
		10	78	78	78	78	78	78	78	78	78	78	78
	500	4	11	11	11	11	11	11	11	11	11	11	11
		6	24	24	24	24	24	24	24	24	24	24	24
		8	43	43	43	43	43	43	43	43	43	43	43
		10	69	69	69	69	69	69	69	69	69	69	69
	600	4	10	10	10	10	10	10	10	10	10	10	10
		6	23	23	23	23	23	23	23	23	23	23	23
		8	41	41	41	41	41	41	41	41	41	41	41
		10	68	68	68	68	68	68	68	68	68	68	68
	700	4	9	10	10	10	10	10	10	10	10	10	10
		6	22	23	23	23	23	23	23	23	23	23	23
		8	38	40	40	40	40	40	40	40	40	40	40
		10	62	63	63	63	63	63	63	63	63	63	63
	800	4	9	9	9	9	9	9	9	9	9	9	9
		6	21	21	21	21	21	21	21	21	21	21	21
		8	38	38	38	38	38	38	38	38	38	38	38
		10	60	60	60	60	60	60	60	60	60	60	60

[m/s] – air flow velocity in the BxH connection duct

Table 4. Sound power level emitted by the ZPP damper to the duct, L_{WA} [dB(A)].

ZPP		v [m/s]	Width B [mm]										
			200	300	400	500	600	700	800	900	1000	1100	1200
Height H [mm]	200	4	25	26	26	27	28	29	30	30	31	31	32
		6	36	37	38	39	39	40	41	42	42	43	44
		8	45	45	47	47	48	48	49	49	50	51	51
		10	49	50	53	54	55	55	55	55	55	55	56
	300	4	26	27	29	29	30	31	32	32	33	33	33
		6	37	39	40	40	40	41	43	43	43	44	45
		8	46	47	48	48	47	48	50	51	52	52	52
		10	51	52	54	55	56	56	56	57	57	57	57
	400	4	27	28	30	31	32	33	33	34	34	35	36
		6	37	38	42	41	41	43	44	44	44	45	45
		8	46	47	49	49	50	50	51	52	53	53	52
		10	52	53	55	55	56	57	57	57	58	58	57
	500	4	27	29	31	30	30	32	34	35	35	35	36
		6	38	40	43	42	42	43	45	45	45	45	45
		8	46	47	49	48	49	50	52	52	53	53	53
		10	53	54	55	56	57	57	57	58	58	58	58
	600	4	27	28	31	32	33	33	34	34	35	35	34
		6	38	39	43	43	43	44	45	45	45	45	46
		8	46	47	48	49	52	52	52	53	53	53	54
		10	53	54	55	56	58	58	57	57	58	58	58
	700	4	28	29	31	32	33	34	35	35	35	35	35
		6	40	41	43	43	44	44	45	45	45	45	46
		8	47	48	50	52	53	53	52	53	53	54	54
		10	54	54	55	57	59	58	58	59	59	59	60
	800	4	29	30	31	32	33	34	35	35	35	36	36
		6	41	41	43	44	45	45	45	45	45	46	46
		8	47	48	51	52	53	53	52	52	53	53	54
		10	54	54	55	56	59	59	59	59	59	60	60

[m/s] – air flow velocity in the BxH connection duct

Table 5. Weight of ZPP damper, m [kg]

ZPP		Width B [mm]										
		200	300	400	500	600	700	800	900	1000	1100	1200
Height H [mm]	200	12	14	16	17	19	20	22	24	26	28	29
	300	13	15	17	19	20	22	25	26	28	30	32
	400	14	16	18	20	22	25	27	29	31	32	34
	500	15	18	20	22	25	27	29	31	33	35	37
	600	17	19	21	24	27	29	31	33	35	38	40
	700	18	20	23	26	28	31	33	36	38	40	43
	800	19	22	25	27	30	33	35	38	40	43	46

Accessories

Types of masking panels for the ZPP damper (fixed to a building partition)

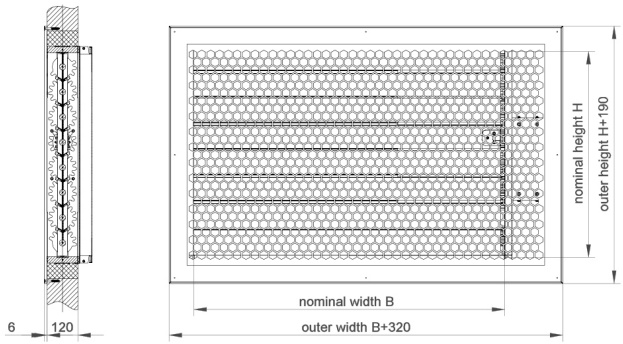


Figure 5. Flat honeycomb mesh cover

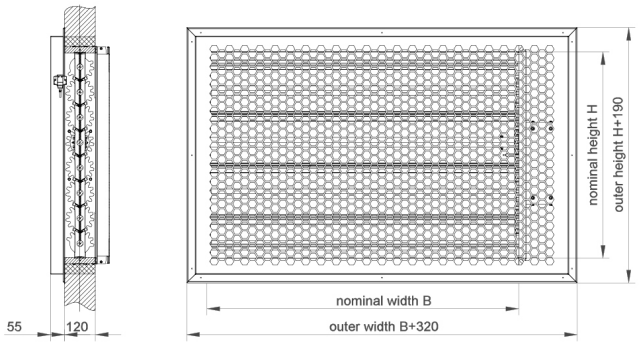


Figure 6. Convex honeycomb mesh cover

The MKW honeycomb mesh cover for ZPP dampers are available in standard dimensions B and H (given in table 2).

Example: for a **ZPP-1200x800** damper, mounted with horizontal blades, the **MKW-B-1200x800** masking cover should be ordered.

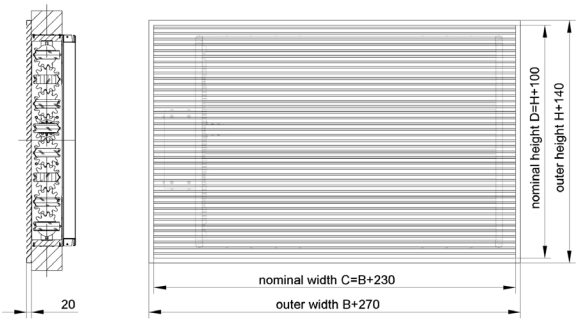


Figure 7. The KST grille for a damper with horizontal blades

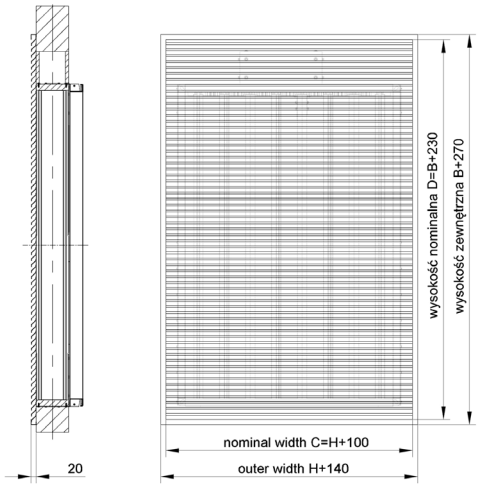


Figure 8. The KST grille for a damper with vertical blades

The KST-<C>x<D> grille should be ordered for the nominal dimensions C x D equal to the dimensions of the assembly opening for the ZPP damper according to the formula:

- C = B+230 mm and D=H+100 mm – for ZPP dampers with horizontal blades,
- C = H+100 mm and D=B+230 mm – for ZPP dampers with vertical blades.

Example: for a **ZPP-1200x800** damper, mounted with horizontal blades, the **KST-1430x900** masking grille should be ordered

ZPP
MULTI-BLADE FIRE DAMPER

When ordering, please provide information according to the following pattern:

ZPP – <F> - <W> - <B> x <H> - <A> / <ADD>

Where:

F – Type of the actuation system used
- E – electric spring return actuator

W – Manufacturing version*
- **K – with connection frames (spigots) - default**
- T – no connection frames (transfer version)
- KL – with one connection frame on L-side
- KR – with one connection frame on R-side

B – Damper clear width [mm]

H – Damper clear height [mm]

A – type of actuator used
- BFN – for BxM ≤ 0,40 m^2
- BF – for BxM > 0,40 m^2

Product marking:
24/230 – supply voltage
T – thermoelectric tripping device
ST – connection socket

ADD – Accesories (not available for version with connection frames <W>=K)
- MKW-B – flat honeycomb mesh cover
- MKW-D – convex honeycomb mesh cover (to thermoelectric tripping device)

P – Finishing of mesh cover*
- **SL – powder coated steel**
- SO – galvanized steel

RAL – colour as per RAL code (for SL finishing)*

* Optional items – if not indicated, default values will be used.

Sample product marking: **ZPP-E-T-1200x800-BF24-T / MKW-B-SL9010**