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DiEM

The Art of Ventilation

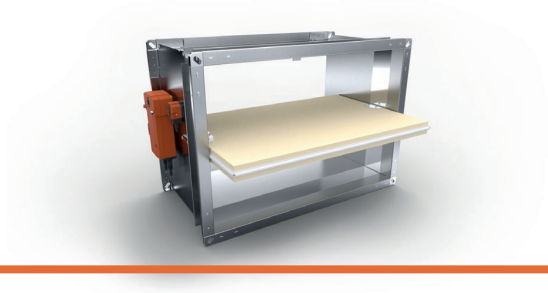
Soler&Palau Ventilation Group

LPP-L

Rectangular fire damper

LPP-L

RECTANGULAR FIRE DAMPER



Product characteristics

A fire damper for general ventilation systems with an electric spring return actuator or a spring mechanism with a thermal fuse.

Intended use

The LPP-L fire dampers are designed for application in general ventilation systems as cut-off partitions separating the fire- engulfed zone from the remaining part of the building (normally open). The purpose of these dampers is to prevent the spread of fire, heat and smoke.

The 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 LPP-L 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 LPP-L fire dampers are classified in the following fire resistance classes and may be installed in the following building partitions:

EI 120 (v_e h_o i↔o) S

- Floors with density of 2,200 ± 200 kg/m3 or higher, 140 mm in thickness or more, and a fire resistance class EI120 or higher.
- Rigid walls with low density (650 ± 200 kg/m^3) or higher, 100 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).
- Flexible walls, 125 mm in thickness or more and EI 120 or a higher fire resistance class (thicker, higher density, more board layers).
- Rigid walls, 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).
- Away from rigid walls of low density (650 ± 200 kg/m^3) or higher, 120 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

- Flexible walls, 100 mm in thickness or more and EI 90 or a higher fire resistance class (thicker, higher density, more board layers).
- Rigid walls, 100 mm in thickness or more, and EI90 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 60 (v_e i↔o) S

- Flexible walls, 100 mm in thickness or more and EI 90 or a higher fire resistance class (thicker, higher density, more board layers).
- Rigid walls, 100 mm in thickness or more, and EI90 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 30 (v_e i↔o) S

- Flexible walls, 75 mm in thickness or more and EI30 or a higher fire resistance class (thicker, higher density, more board layers)
- Rigid walls, 75 mm in thickness or more, and EI30 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).

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).

120/90/60/30 – duration of fulfilment of E, I and S criteria in minutes.

Fire ventilation zone

EN 15650

SO | SN | Ho

Ve | Ve | Ve

The LPO fire dampers may be installed in vertical building partitions with either horizontal or vertical rotation axis, with any actuator position.

> ! The LPP-L fire dampers may be installed in vertical building partitions with either horizontal or vertical rotation axis, with any actuator position.

Description

The LPP-L-S dampers (with a spring mechanism) and the LPP-L-E dampers (with an electric spring return actuator) consist of a housing of a rectangular cross-section, a moving, single-axis isolating baffle and an actuating mechanism with a release device. The damper housing and its interacting elements are made of galvanised steel sheet. Connection flanges are on both ends of the housing for easy connection between the duct and the damper.

There are intumescent seals on the outer and inner surfaces of the housing, in the place of perforation, around the closed isolating baffle. Their characteristic feature is that their volume increases at high temperatures, tightly filling all leaks between the baffle and the body.

The isolating baffle of the damper is made of calcium-silicate board, and a rubber seal is installed on its perimeter, ensuring the damper integrity at ambient temperature.

The LPP-L-S damper is provided with a spring mechanism comprising, e.a. an actuating spring, a manual release device and a fusible link with a nominal triggering temperature of 70 ± 5°C. When the damper is being opened with a key, the actuating spring is being tensioned. The baffle is kept in the open position by the manual release device, blocked with a fusible link. The damper is automatically closed as a result of triggering the fusible link. The damage to the thermal trip automatically rotates the isolating baffle (to the closed position). The movement of the baffle is limited by two buffers.

The LPP-L-E damper is provided with an electric spring return actuator BFL, BFN or BF series manufactured by BELIMO, and the BAT or BAE thermal triggers (72 °C, 95 °C optionally), constituting damper's drive system supplied by the 230 V AC or 24 V AC/DC voltage. After the voltage has been supplied, the actuator rotates the baffle to the open position. The baffle is closed due to voltage loss or when the thermal trigger is activated (the return spring in the actuator closes the baffle by returning to the non-stressed position). During normal operation of the system, the LPP-L-S and LPP-L-E dampers are in the open position. If a fire breaks out, the damper baffle rotates to the closed position.

The permissible air velocity in a connection duct for the LPP-L- E dampers with an actuator is 12 m/s and 8 m/s for the LPP-L-S dampers with a spring mechanism.

Manufacturing versions

The range of dampers covers the following dimensions: a clear damper width from 160 to 800 mm (10 mm intervals from the width 200 mm) and a clear damper height from 200 to 500 mm (10 mm intervals). The primary type series of damper dimensions, including actuators, is provided in the table below.

Depending on the actuation system used, the dampers are marked as follows:

- LPP-L-S – the dampers with a spring mechanism
- LPP-L-E – the dampers with an electric spring return actuator.

The length of the LPP-L dampers is L=350 mm. The dampers may also be fitted with limit switches indicating the open or closed position of the baffle.

> ! In a special version, resistant to aggressive environments, all components of the damper are made of stainless steel, whereas the damper baffle is impregnated with a fire-resistant board impregnation..

The LPP-L dampers may be fitted with inspection openings for checking the damper condition once it is installed in the ventilation system.

Dimensions

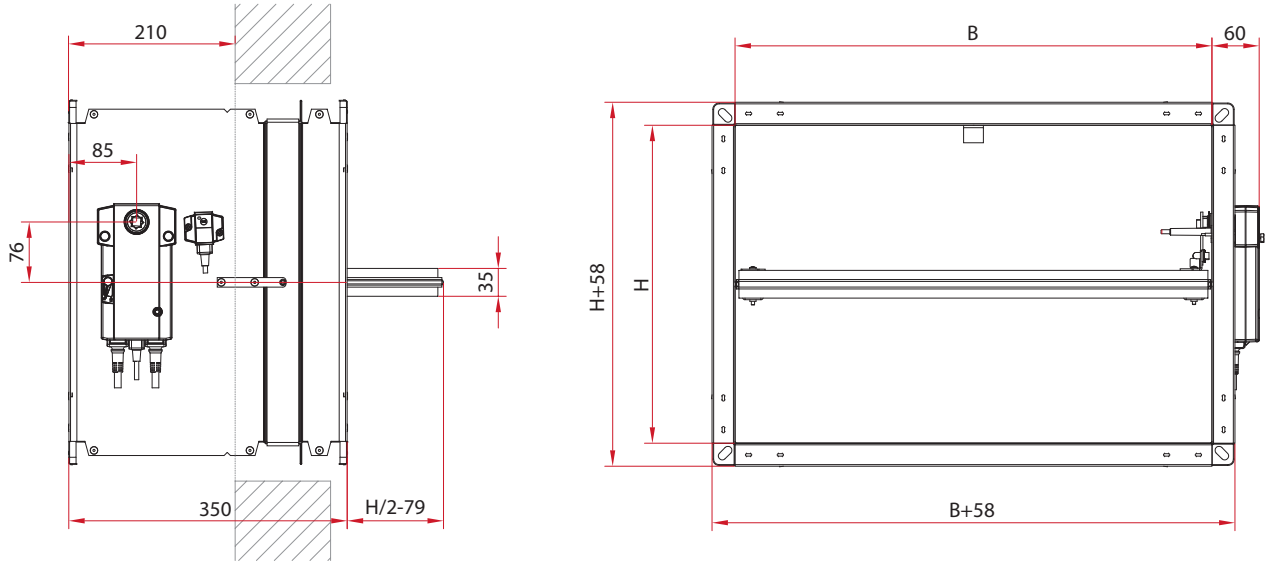


Figure 1. LPP-L-E damper (with an electric actuator).

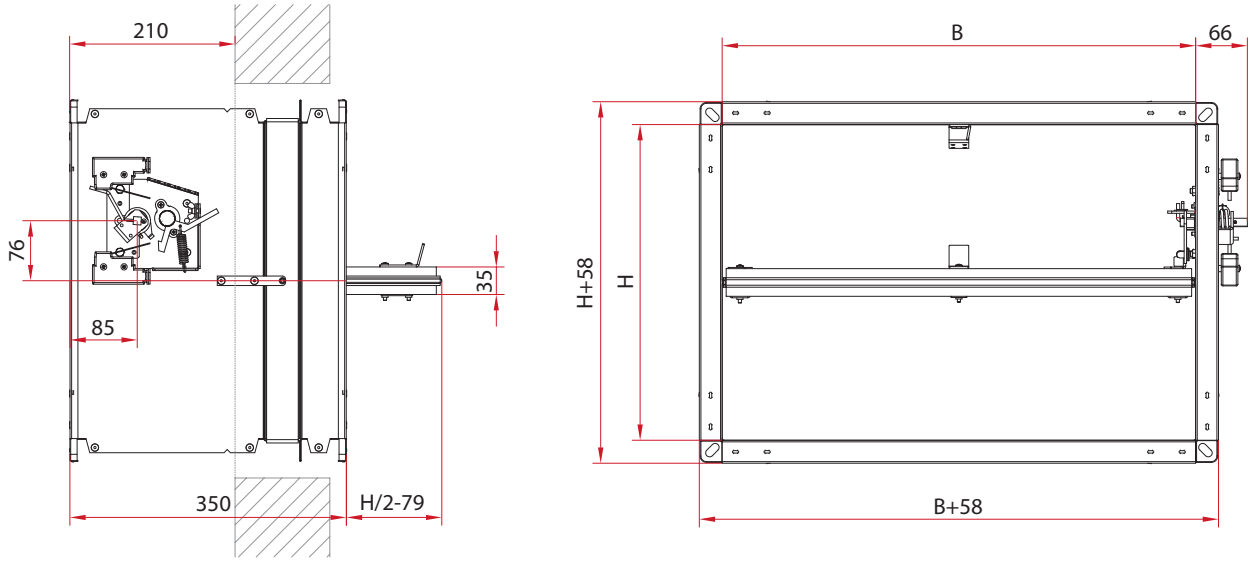


Figure 2. LPP-L-S damper (with a spring mechanism).

> **!** During installation of the damper with an actuator on the opposite side of the body, rotate the damper 180 degrees – cables will go up from the actuator.

Installation

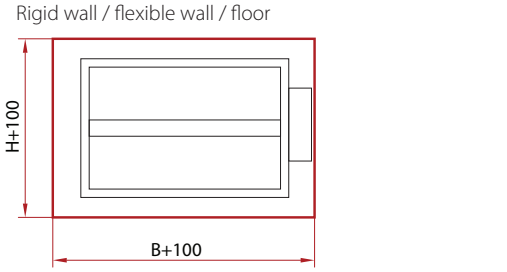


Figure 3. Openings required for the LPP-L damper.

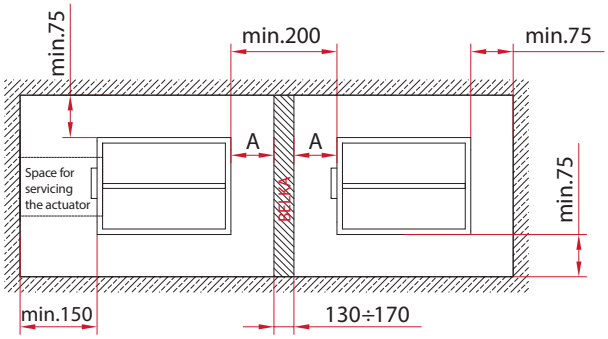


Figure 4. Spacing required between dampers

Technical data

Table 1. The net surface area and the range of actuators used for the LPP-L dampers.

LPP-L		Width B [mm]													
		160	200	250	300	350	400	450	500	550	600	650	700	750	800
Height H [mm]	200	0,026	0,033	0,041	0,050	0,058	0,066	0,074	0,083	0,091	0,099	0,107	0,116	0,124	0,132
	250	0,034	0,043	0,054	0,065	0,075	0,086	0,097	0,108	0,118	0,129	0,140	0,151	0,161	0,172
	300	0,042	0,053	0,066	0,080	0,093	0,106	0,119	0,133	0,146	0,159	0,172	0,186	0,199	0,212
	350	-	0,063	0,079	0,095	0,110	0,126	0,142	0,158	0,173	0,189	0,205	0,221	0,236	0,252
	400	-	0,073	0,091	0,110	0,128	0,146	0,164	0,183	0,201	0,219	0,237	0,256	0,274	0,292
	450	-	-	0,104	0,125	0,145	0,166	0,187	0,208	0,228	0,249	0,270	0,291	0,311	0,332
	500	-	-	0,116	0,140	0,163	0,186	0,209	0,233	0,256	0,279	0,302	0,326	0,349	0,372

BFL actuator (BxH≤0,24m^2)

BFN actuator (BxH>0,24m^2)

Table 2. Pressure drop on LPP-L damper, Δp [Pa]

LPP-L		v [m/s]	Width B [mm]							
			160	200	300	400	500	600	700	800
Height H [mm]	200	4	7	7	7	6	4	3	2	2
		6	15	14	13	12	9	8	5	5
		8	24	24	23	21	17	12	11	10
		10	41	40	37	33	28	20	17	15
	300	4	6	6	5	4	3	2	2	2
		6	15	13	10	8	7	5	5	4
		8	23	21	17	14	12	9	8	7
		10	34	32	27	22	19	15	14	13
	400	4	-	6	5	4	3	3	2	2
		6	-	12	9	7	5	5	4	4
		8	-	20	15	12	10	7	7	7
		10	-	30	23	19	14	11	10	10
	500	4	-	-	3	3	2	2	2	2
		6	-	-	7	6	4	3	3	3
		8	-	-	13	10	7	6	6	5
		10	-	-	20	15	11	9	9	9

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

Table 3. Sound power level emitted by the LPP-L damper to the duct, LWA [dB(A)]

LPP-L		v [m/s]	Width B [mm]							
			160	200	300	400	500	600	700	800
Height H [mm]	200	4	19	20	20	25	26	26	26	27
		6	28	30	30	35	37	37	37	38
		8	36	37	37	42	46	46	46	47
		10	41	41	42	49	50	50	51	52
	300	4	18	18	18	20	25	25	25	26
		6	28	29	30	32	33	36	36	37
		8	35	36	38	40	40	44	45	46
		10	40	40	42	44	45	49	50	51
	400	4	-	17	17	18	20	23	25	25
		6	-	25	25	26	30	33	35	35
		8	-	34	35	35	36	40	43	44
		10	-	39	40	40	42	45	48	49
	500	4	-	-	16	16	17	18	22	25
		6	-	-	26	26	27	29	32	34
		8	-	-	35	35	35	36	39	43
		10	-	-	40	40	40	42	45	48

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

Table 4. Weight of LPP-L-E damper, m [kg]

LPP-L-E		Width B [mm]							
		160	200	300	400	500	600	700	800
Height H	200	5,0	6,0	7,0	8,1	9,1	10,1	11,2	12,2
	300	5,8	7,0	8,2	9,5	10,7	11,9	13,1	14,3
	400	-	8,1	9,5	10,9	12,2	13,6	15,4	16,7
	500	-	-	10,7	12,2	14,1	15,7	17,3	18,8

Table 5. Weight of LPP-L-S damper, m [kg]

LPP-L-S		Width B [mm]							
		160	200	300	400	500	600	700	800
Height H	200	4,9	5,9	6,9	8,0	9,0	10,1	11,1	12,1
	300	5,7	6,9	8,2	9,4	10,6	11,8	13,0	14,2
	400	-	8,0	9,4	10,8	12,2	13,6	14,9	16,3
	500	-		10,6	12,2	13,7	15,3	16,9	18,4

LPP–L
RECTANGULAR FIRE DAMPER

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

LPP–L – <F> – <B> x <H> – <W> – <S> – <Q> – <P> – <RAL>

Where:

F – type of the actuation system used
S – spring mechanism
E – electric spring return actuator

B – damper clear width [mm]

H – damper clear height [mm]

W – limit switches (LPP–L–S dampers only; dampers with actuators are always equipped with limit switches)*
none – no limit switches
W1 – limit switch indicating damper closed position
W2 – limit switch indicating damper open position
W12 – two limit switches indicating closed and open damper positions

S – type of actuator used (only for the LPO–O–E dampers)
BFL – for B x H ≤ 0,24 m
BFN – for B x H > 0,24 m^2
BF – for communication control (TL)

Product marking:
24/230 – supply voltage
SR – analogue control
TL – communication control
T – thermoelectric tripping device
ST – connection socket

Q – inspection opening*
none – no inspection opening
R – inspection opening

P – finishing*
none – galvanized steel
SN – stainless steel
SL – coated steel

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

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

Attention: In special damper versions with higher resistance (stainless or painted) the baffle is impregnated.
Sample product marking: **LPP-L-E-800x500-BFN24-T**
LPP-L-S-200x200-W12-R-SL-9010