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DiEM

The Art of Ventilation

Soler&Palau Ventilation Group

LPP

Installation manual

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INSTALLATION TECHNOLOGY

Prior to the installation, fire dampers should be checked whether there has been no damage to the dampers during transportation or storage..

Check whether the damper baffle could be opened and closed (fully open and closed position). To open fire dampers LPP-E use the actuator key.

The full opening and closing must proceed smoothly (not stepwise).

You must not pull by baffle to open or close fire damper, it could cause lead to permanent damage, not covered by the warranty.

While testing LPP-S open it by key, placed on the damper.

The damper must be protected with covering material before montage, so it will be protected from soiling, and consequently damaging the elements of the damper.

ATTENTION: Distance between fire dampers or fire damper and construction elements must be compatible with standard 1366-2:

- Minimal 200 mm between fire damper, which are installed in different ventilating wires,
- Minimal 75 mm between fire damper and construction element (wall/ceiling).

Before installing fire dampers please read assembly technology recommended by the manufacturer. The way of installing recommended by one manufacturer may not be the same for other dampers. Recommended material and dimensions of the openings follow from experience from conducted research. In rectangular dampers, most of all dampers with cross-sectional area more than 1 m^2, it is recommended to use mounting wedge and spreader securing the housing against squeezing during assembly.

Squeezing the housing can change the dimensions of slot between baffle and housing, correct dimensions of this slot is needed to keep correct way of opening and closing the damper. Correct preparation of the damper for the installation is presented on the figure 3 and 4.

Figure 1. Correct preparation of the damper for the installation (using spreader securing the housing).

Figure 2. Correct preparation of the damper for the installation (using mounting wedge).

ATTENTIONS:

a. The damper must be installed in such way, that the axis of baffle must be in horizontal or vertical position.

b. Damper can not be used as formwork for the wall.

c. Ventilation ducts should be installed that they cannot put any load on the damper, their suspension must ensure their full load capacity.

d. The suspensions of the ventilation ducts connected to the dampers batteries must be made in accordance with the instruction of the manufacturer of ventilation ducts.

e. In place of Z1 and Z2 suspensions, which are installed for the time of assembly of the damper and in place of mortar binding, it is possible to use mounting brackets, paying attention to the immobilization of the damper.

1. INSTALLATION TECHNOLOGY – RIGID WALL

a. Make an opening in the wall with the 100 mm (acceptable 80 ÷ 120 mm) greater than the nominal dimensions of the fire damper = B+100 and H+100.

b. Put the closed fire damper into the installation opening on depth marked by undercuts on the damper body (dimension 60 mm), from one side fix it with suspension Z1, and from other side fix it to the ventilation duct suspended on Z2 suspension.

c. After setting the fire damper as described, fill the gap between the fire damper and the wall with cement, cement-lime mortar, concrete, or PROMASTOP MG III made by PROMAT.

d. After 48 hours from the installation, the suspensions and supports used during installation of fire damper, may be removed.

ATTENTIONS:

- Carry out the installation in protective clothing, (gloves, glasses, helmet),
- Pay attention at the sharp edges of the sheets,
- Damper Baffle axis must be in horizontal or vertical position after montage,
- Damper can not be a formwork for wall,
- Ventilations duct should be installed that they cannot put any load on the damper, their suspension must ensure their full load capacity,
- The suspensions of the ventilation duct connected with the damper battery must be done according to instruction manufacturer of ventilation ducts,
- In place of suspensions Z1 and Z2, which are installed for the time of assembly of the damper and in place of mortar binding it can be used mounting brackets, paying attention to the immobilization of the damper.

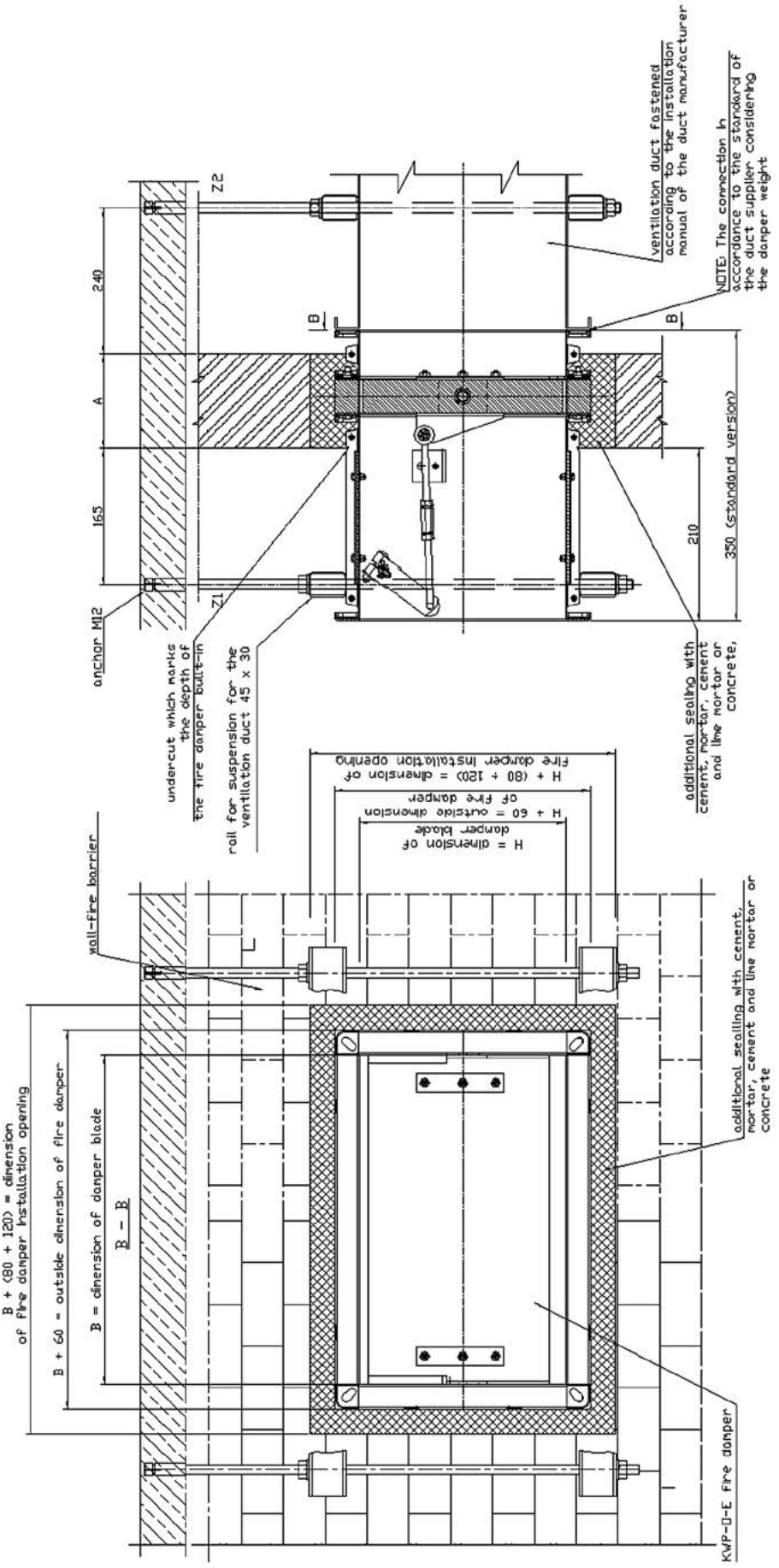

Figure 3. Installation method of LPP fire dampers in a rigid wall.

2. INSTALLATION TECHNOLOGY – FLEXIBLE WALL

a. Make an opening in the wall with the dimensions 100 mm (acceptable 80 ÷ 120 mm) greater than the nominal dimensions of the fire damper = B+100 i H+100.

b. Make a frame of two layers of GKF boards, 12,5 mm thick and the width relative to the width of opening, mounting by screws screws remembering to carefully seal the contact edges with a mastic: Hilti Firestop Coating CP 673, Promastop-Coating, Promaseal-Mastic lub Soudal Firesilicone B1 FR.

c. Put the closed fire damper into the installation opening and support or suspend, in this way that the minimum installation depth mark is on the plane of the flange surface.

d. After setting the fire damper as described, fill the gap between the fire damper and the wall with non-flammable mineral wool of high density, 80 kg/m3 or more.

e. Seal the place of filling with mineral wool using the sealing compounds given in pts.2.

f. Mount collar, both side of wall, made of GKF boards, 15 mm thick and 150 mm wide, using screws.

g. After mounting the collar, remove the supports or suspensions, check the fire damper correct operation and leave it in open position.

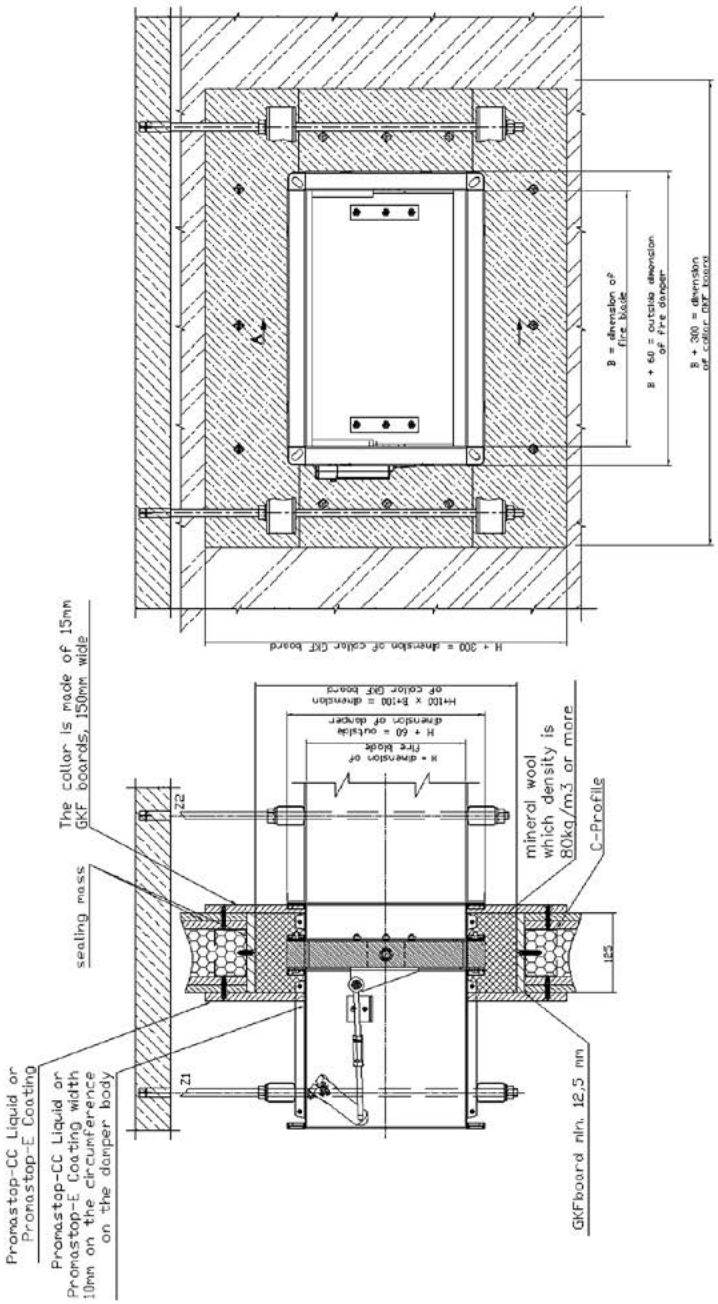

Figure 4. Installation of LPO-L fire dampers in rigid wall with vertical rotation axis of baffle.

3. INSTALLATION TECHNOLOGY – CEILING

a. Make an opening in the ceiling with the 100 mm (acceptable 80 ÷ 120 mm) greater than the nominal dimensions of the fire damper = B+100 and H+100.

b. Put the closed fire damper into the ceiling to the depth marked on housing (dimension 60mm)

c. After setting the fire damper as described, with using montage supports, fill the gap between the fire damper and the wall with cement, cement-lime mortar, concrete. Under difficult working conditions producer recommend PROMASTOP MG III mortar of production of the PROMAT company.

d. Mount the mounting brackets on each side.

Number of mounting brackets:

- Side length up to 500 mm – 1 pcs.
- Side length from 500 to 800 mm – 2 pcs.

e. Housing install with actuator similarly as in the picture. Only the length of the supports changes. Install the mounting brackets to the ceiling by using dowels

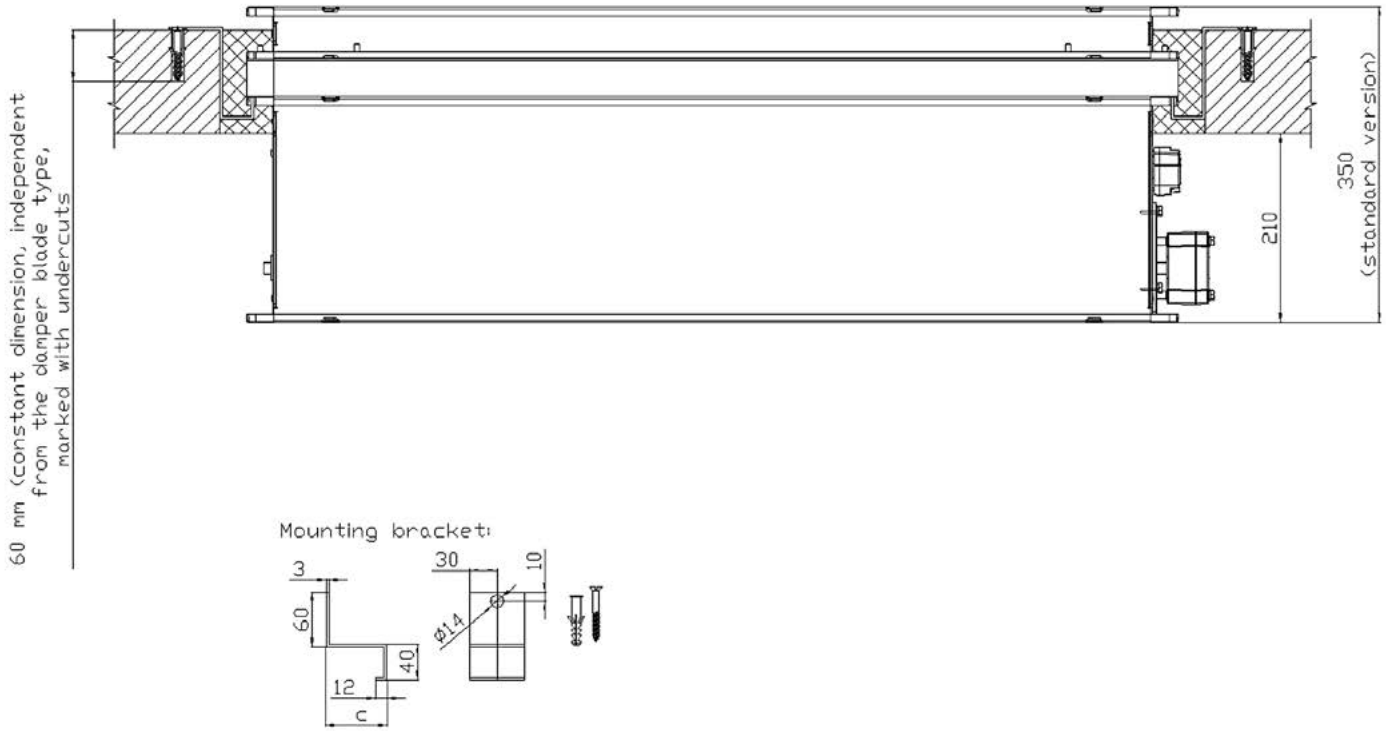

Figure 5. Proposed dimensions of mounting brackets for installation in a ceiling.

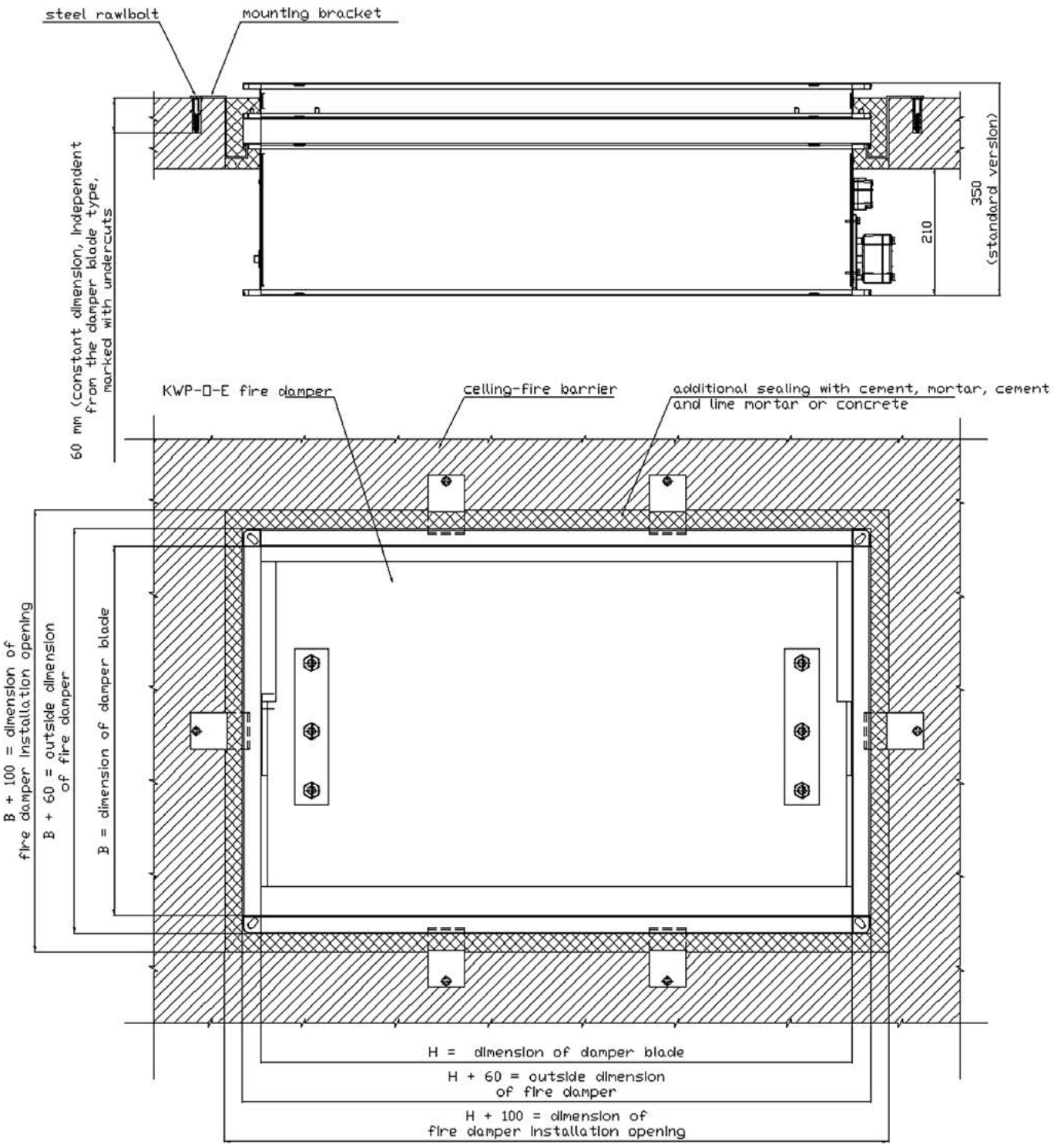

Figure 6. Installation method of LPP fire dampers in a ceiling.

4. INSTALLATION TECHNOLOGY – STRUCTURES THICKER THAN 135 mm

The LPP-E(S) damper can be installed also in horizontal compartments thicker than length of damper's body. In this case, ventilation ducts are going to be partially inbuilt in the fire compartment (Figure 9).

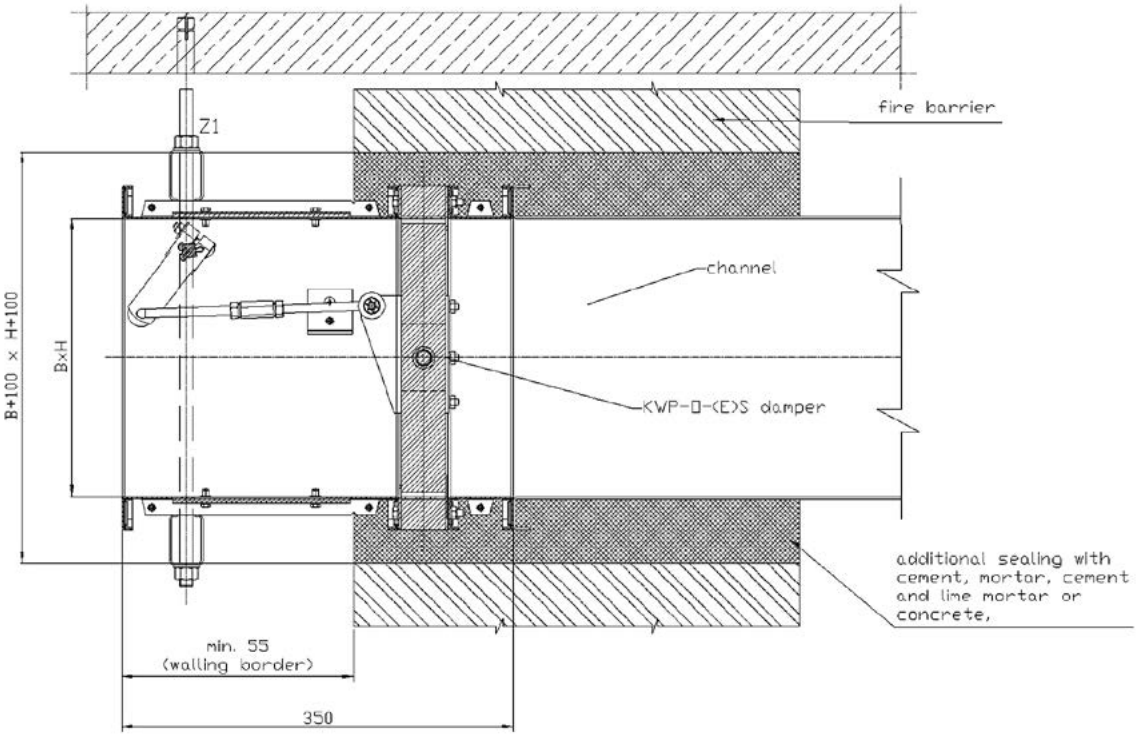

Figure 7. Installation method of LPP fire dampers in structures thicker than 135 mm.

5. INSTALLATION TECHNOLOGY FOR FIRE DAMPERS IN BATTERIES

The assembly of fire dampers in batteries is possible only after previous delivery of the information (at the stage of ordering) about which fire dampers and in which arrangement (horizontal or vertical) would be installed in a wall, in order to prepare suitable opening for self-tapping screws in the fire damper body.

There are two possibilities of realizing the order of fire damper batteries: basic and complete. First one covers the set of fire dampers, assembly strips and complete set of self-tapping screws. The purchase of other materials needed such as: intumescent gasket (PRO-MASEAL-PL PVC SK), mineral wool for thermal insulation (with minimum density of 60 kg/m3) and aluminum tape remains with the Customer. The secund variant provides for supply by the Manufacturer of complete set of fire dampers and all the elements needed for installation.

The fire dampers are assembled into batteries with use of assembly strips with length of 1200 mm. In case when total dimension of their battery is smaller than multiple of the length of the assembling strip, the last one should be cut with angle grinder on the construction site to match the dimension of the battery (basic variant) or cut in manufacturing facility by Manufacturer (complete variant)

Fire dampers should be marked with letters: A, B, C, D.

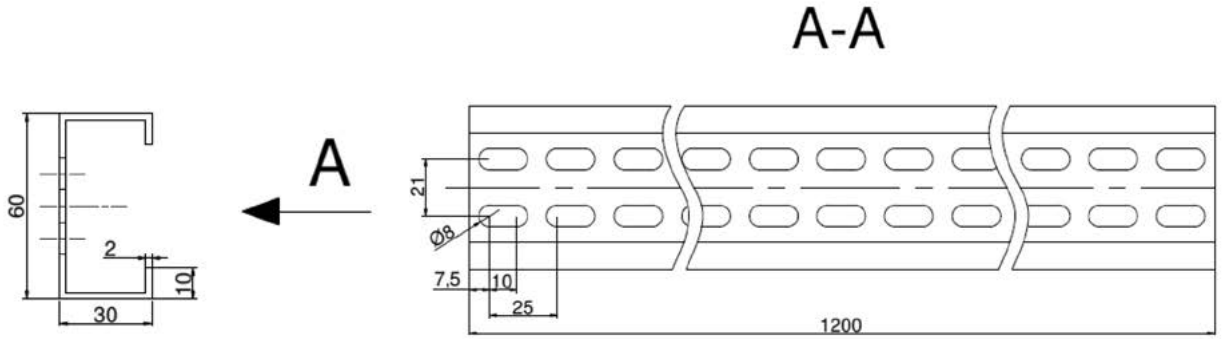

Figure 8. Connection strip**.**

DIEM offers four basic types of damper battery systems.

Arrangement 1 – vertical battery consisting of two fire dampers LPP (Figure 11):

a. Fix the gasket on insulating spacer of one of adjoining fire dampers (position (1) in the Figure 11).

b. Put non-combustible mineral wool into recess in upper surface of the fire damper. The thickness of mineral wool should be twice as the thickness of the recess in upper surface of the fire damper in order to fill the whole free space between the fire dampers as shown in (w1).

NOTE: The alternative way of wool mounting is to use two layers of wool with thickness of 30 mm. In this case, apply the fire resistant PROMASTOP-Coating with width of 50 mm. The mass is placed between the strips of wool and between wool and damper housings.

d. Place the fire damper A on the fire damper B and assemble them together on the front and back with use of perforated assembly strips (2) and self-tapping screws M6 x 16 (3), which should be tightened into the openings in fire damper body. In order to carry out the correct assembly, 4 self-tapping screws should be used per each assembly strip with length of 1200 mm.

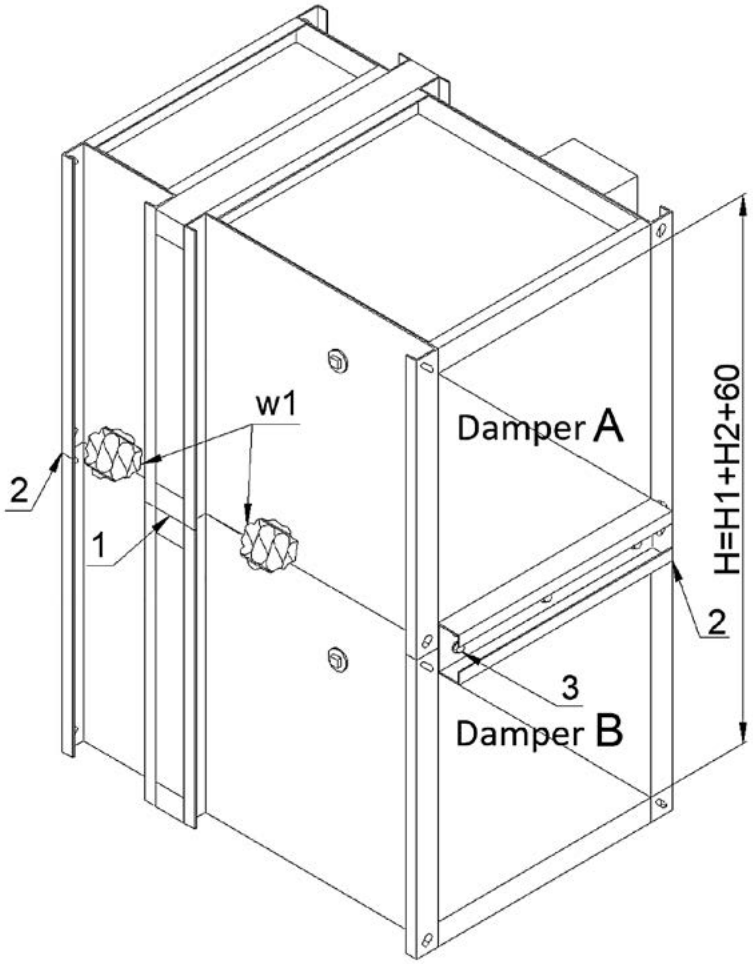

Figure 9. Arrangement 1 - vertical battery consisting of two LPP fire dampers.

Arrangement 2 – vertical battery consisting of three fire dampers LPP (Figure 12):

a. Fix the gasket on insulating spacer of one of adjoining fire dampers (position (1) in the Figure 12).

b. Put non-combustible mineral wool into recess in upper surface of the fire damper. The thickness of mineral wool should be twice as the thickness of the recess in upper surface of the fire damper in order to fill the whole free space between the fire dampers as shown in (w1).

   NOTE: The alternative way of wool mounting is to use two layers of wool with thickness of 30 mm. In this case, apply the fire resistant PROMASTOP-Coating with width of 50 mm. The mass is placed between the strips of wool and between wool and damper housings.

c. Place the fire damper B on the fire damper C and assemble them together on the front and back with use of perforated assembly strips (2) and self-tapping screws M6 x 16 (3), which should be tightened into the openings in fire damper body. In order to carry out the correct assembly, 4 self-tapping screws should be used per each assembly strip with length of 1200 mm.

d. Repeat accordingly paragraphs 2 and 3 to assemble fire damper A on fire damper B.

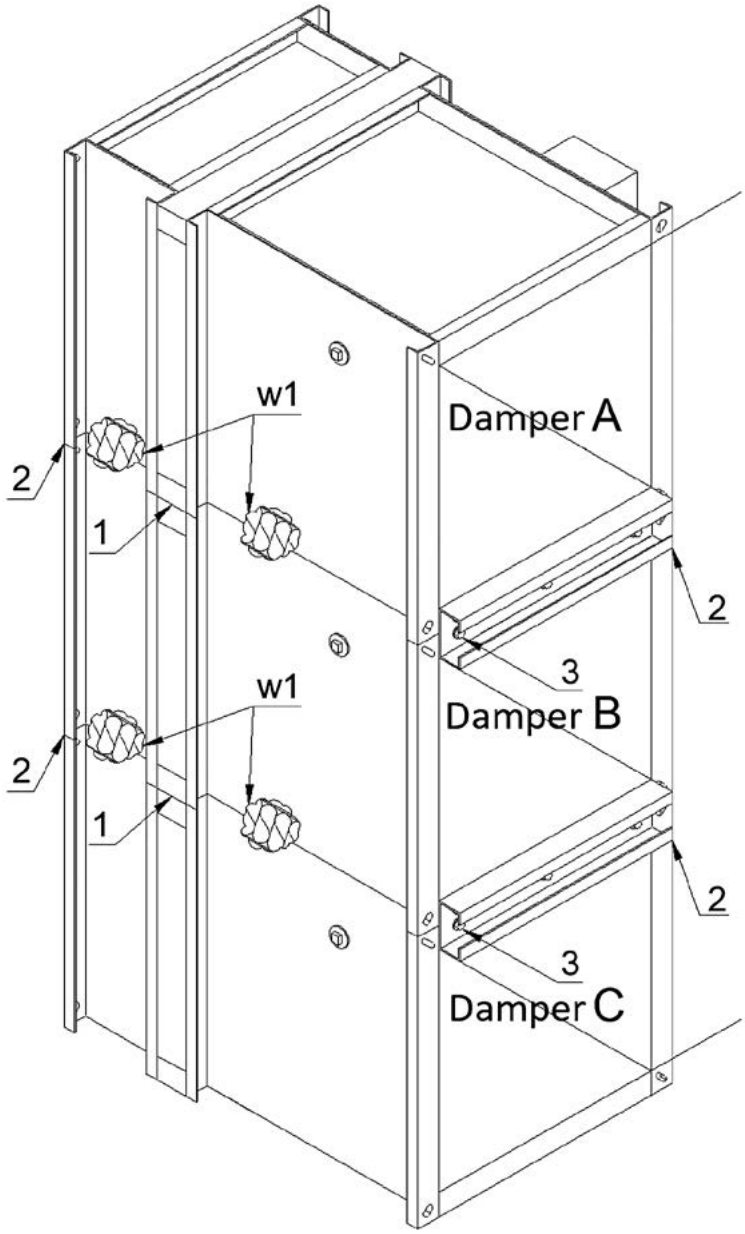

Figure 10. Arrangement 2 - vertical battery consisting of three LPP fire dampers.

Arrangement 2 – horizontal battery consisting of two fire dampers LPP (Figure 13):

a. Fix the gasket on insulating spacer of one of adjoining fire dampers (position (1) in the Figure 13).

b. Set together the sides of fire damper A and the fire damper B (where the gasket was fixed) and assemble them together on the front and back with use of perforated assembly strips (2) and self-tapping screws M6x16 (3), which should be tightened into the openings in fire damper body. In order to carry out the correct assembly, 4 self-tapping screws should be used per each assembly strip with length of 1200 mm.

c. Fill the whole free space between the joint of fire dampers with non-combustible mineral wool, as shown in (w1).

NOTE: The alternative way of wool mounting is to use two layers of wool with thickness of 30 mm. In this case, apply the fire resistant PROMASTOP-Coating with width of 50 mm. The mass is placed between the strips of wool and between wool and damper housings.

c. The place of sealing the top of the fire damper with mineral wool should be sealed with aluminum tape (4).

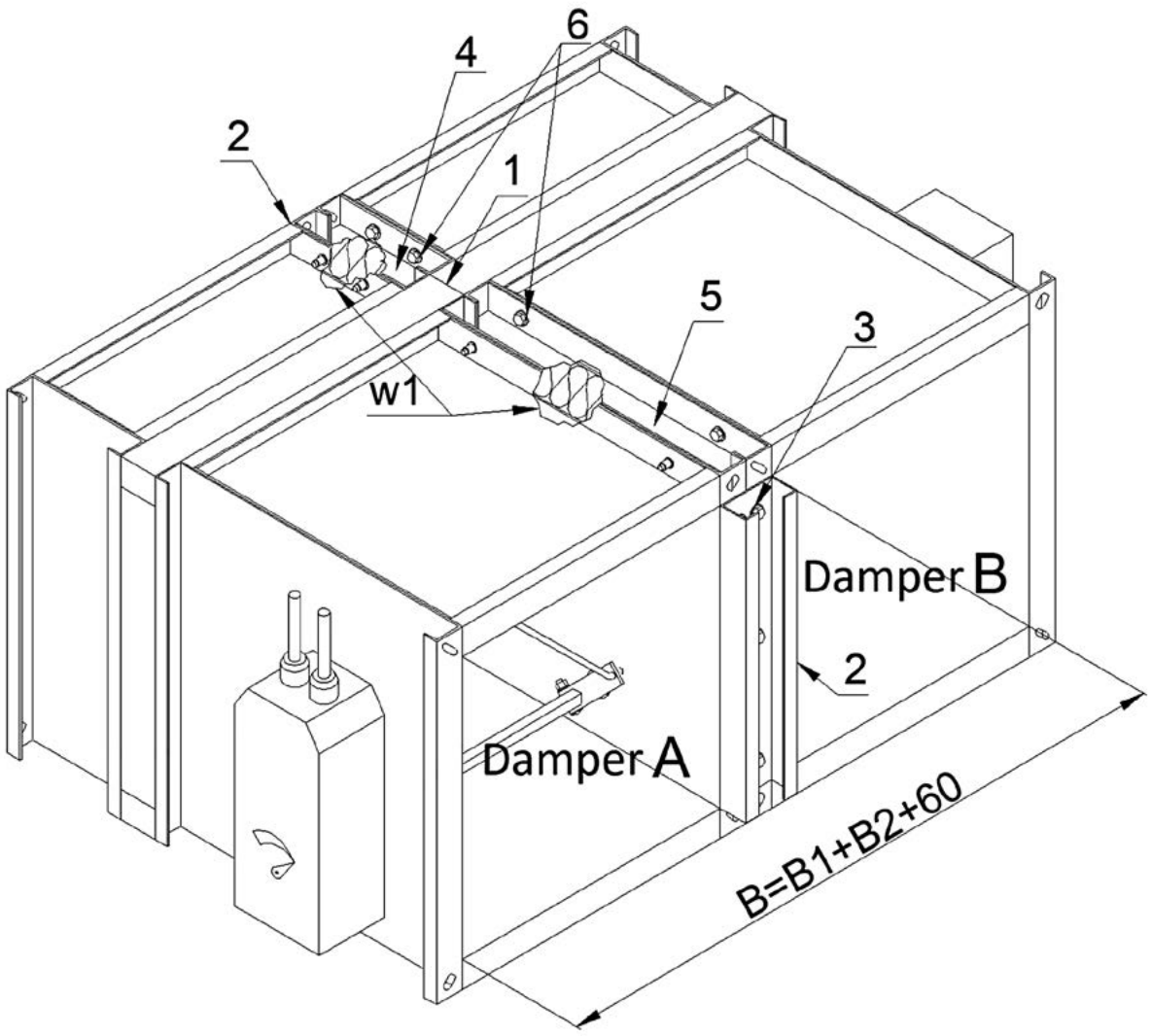

Figure 11. Arrangement 3 – horizontal battery consisting of two LPP fire dampers.

Arrangement 2 – battery consisting of four fire dampers LPP (Figure 14):

The assembly of battery consisting of four LPP fire dampers is divided into two steps:

- Step 1 – assembly of fire damper A and fire damper B and assembly of fire damper C and fire damper D.
- Step 2 – assembly of the set of fire dampers A, B and the set of fire dampers C, D.

Step 1:

a. Fix the gasket on insulating spacer of one of adjoining fire dampers (position (1) in the Figure 14).

b. Set together the sides of fire damper A and the fire damper B (where the gasket was fixed) and assemble them together on the front and back with use of perforated assembly strips (2) and self-tapping screws M6 x 16 (3), which should be tightened into the openings in fire damper body. In order to carry out the correct assembly, 4 self-tapping screws should be used per each assembly strip with length of 1200 mm.

c. Repeat paragraph 2 to assemble fire damper **C** on the fire damper **D**.

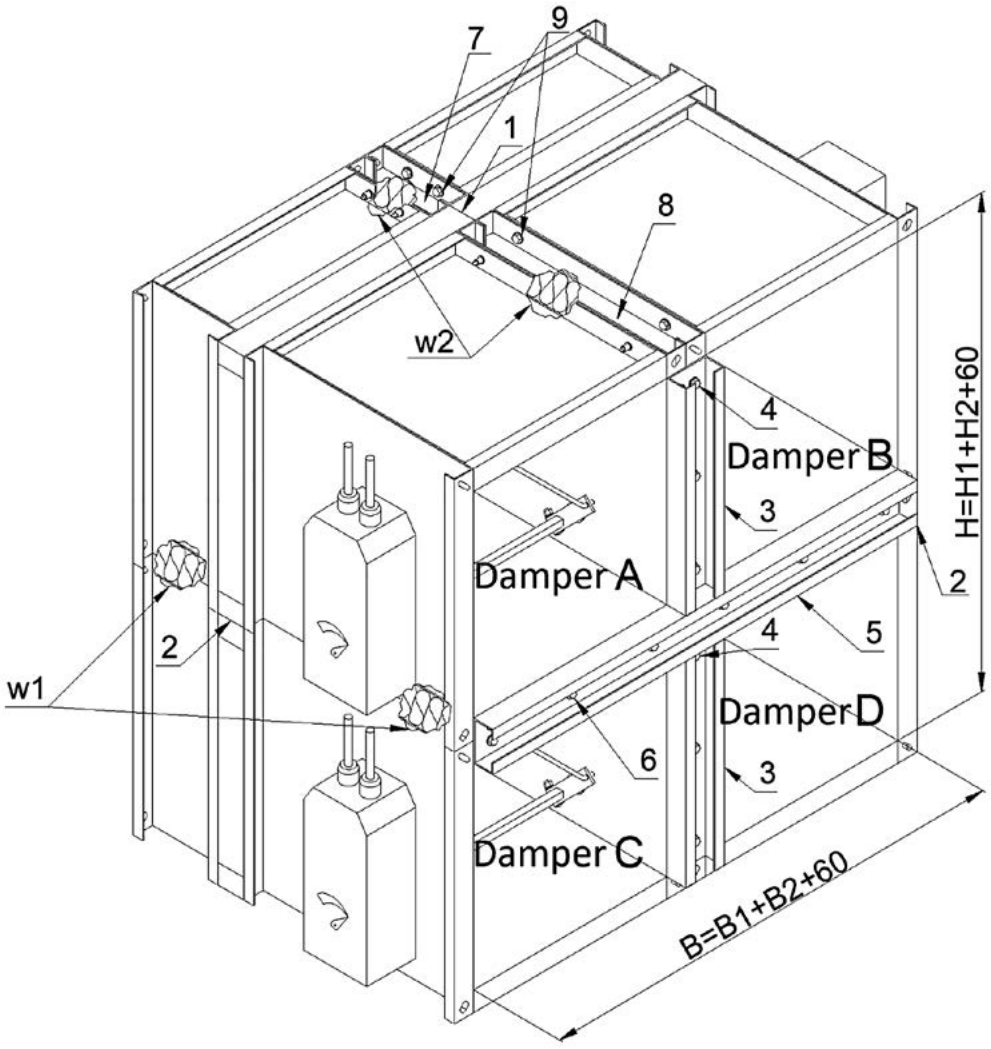

Figure 14. Battery made of four LPP fire dampers.

Step 2:

a. Fix the gasket on insulating spacer of one of adjoining fire dampers (position (2) in the Figure 13).

b. Put non-combustible mineral wool into recess in upper surface of the fire damper C and fire damper D. The thickness of mineral wool should be twice as the thickness of the recess in upper surface of the fire dampers in order to fill the whole free space between the fire dampers C and D and the fire dampers A and B, as shown in (w1).

NOTE: The alternative way of wool mounting is to use two layers of wool with thickness of 30mm. In this case, apply the fire resistant PROMASTOP-Coating with width of 50 mm. The mass is placed between the strips of wool and between wool and damper housings.

d. Place the set of fire dampers A and B on the set of fire dampers C and D and assemble them together on the front and back with use of perforated assembly strips (5) and self-tapping screws M6 x 16 (6), which should be tightened into the openings in fire damper body. In order to carry out the correct assembly, 4 self-tapping screws should be used per each assembly strip with length of 1200 mm.

e. The empty space between joint of the bodies of fire dampers A, B and fire dampers C, D should be filled with non-combustible mineral wool (as shown in (w2)).

f. NOTE: The alternative way of wool mounting is to use two layers of wool with thickness of 30mm. In this case, apply the fire resistant PROMASTOP-Coating with width of 50 mm. The mass is placed between the strips of wool and between wool and damper housings.

g. The place of sealing the top of the battery with mineral wool should be sealed with aluminum tape (7).

Installation of LPP fire dampers batteries in rigid wall compartment (Figure 15 to 18):

a. Make an opening in the wall with dimensions depending on the battery size and its arrangement.

- For vertical battery consisting of two LPP fire dampers: (B1+120)x(H1+H2+180) (Figure 15).
- For vertical battery consisting of three LPP fire dampers: (B1+120)x(H1+H2+H3+240) (Figure 16).
- For horizontal battery consisting of two LPP fire dampers: (B1+B2+180)x(H1+120) (Figure 17).
- For battery consisting of four LPP fire: (B1+B2+180)x(H1+H2+180) (Figure 18)

b. Put the battery of fire dampers into the installation opening on depth marked by undercuts on the damper body [dimension 60 mm). From one side fix it with suspension Z1, and from other side, fix it to ventilation duct suspended on suspension Z2 according to the figure).

c. NOTE: Fixing of the ductwork has to cover the weight of the battery of fire dampers. Specifically the bolts, anchors, installation frame of the duct and screws used to join the duct with battery of fire dampers should be taken into account. If there is no possibility of ensuring the safe suspension of the battery of fire dampers during installation, the battery should be supported from the bottom side.

d. After setting the fire damper as described, fill the gap between the fire damper and the wall with cement, cement-lime mortar or concrete or PROMASTOP MG III of production of the PROMAT company.

e. After 72 hours from the finish of assembly, you can disassemble suspensions.

REMARKS:

a. Install the fire damper in such way, that the damper blades would be in horizontal position.

b. Fire damper cannot be the support for the constructed wall.

c. Ductwork cannot be the load for the fire damper, ductwork suspensions have to provide full load capacity.

d. Ductwork suspensions fixed to the fire damper have to be made in accordance with the ductwork manufacturer instructions.

e. Selection of mounting rails should be performed in accordance to the guidelines provided by the manufacturer of suspensions, considering weight and arrangement of the battery of fire dampers.

f. In place of suspensions Z1, Z2 and cement mortar, mounting brackets may be applied! Paying special attention for immobilization of the fire damper).

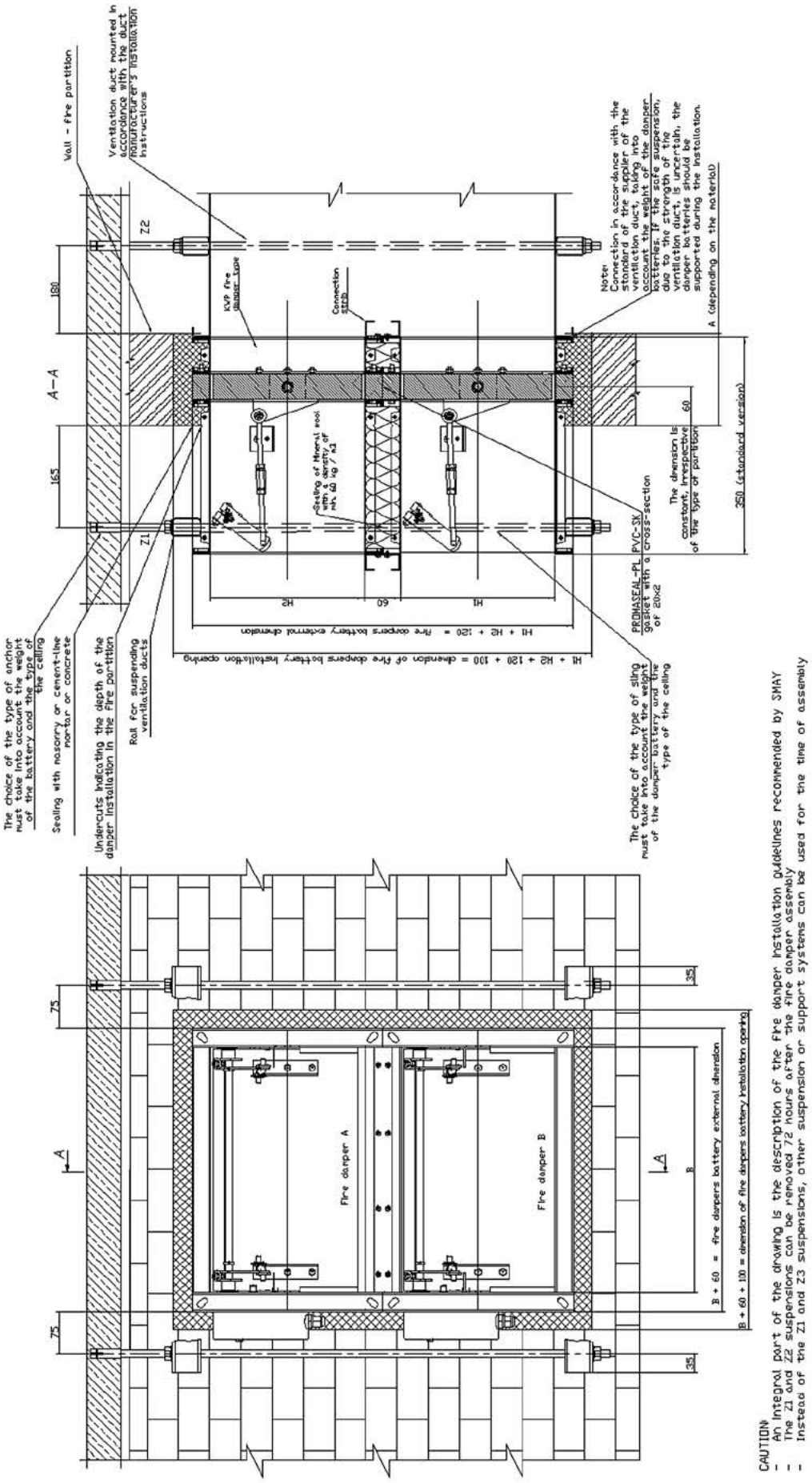

Figure 13. Installation of a battery consisting of two fire dampers LPP in vertical arrangement in ceiling.

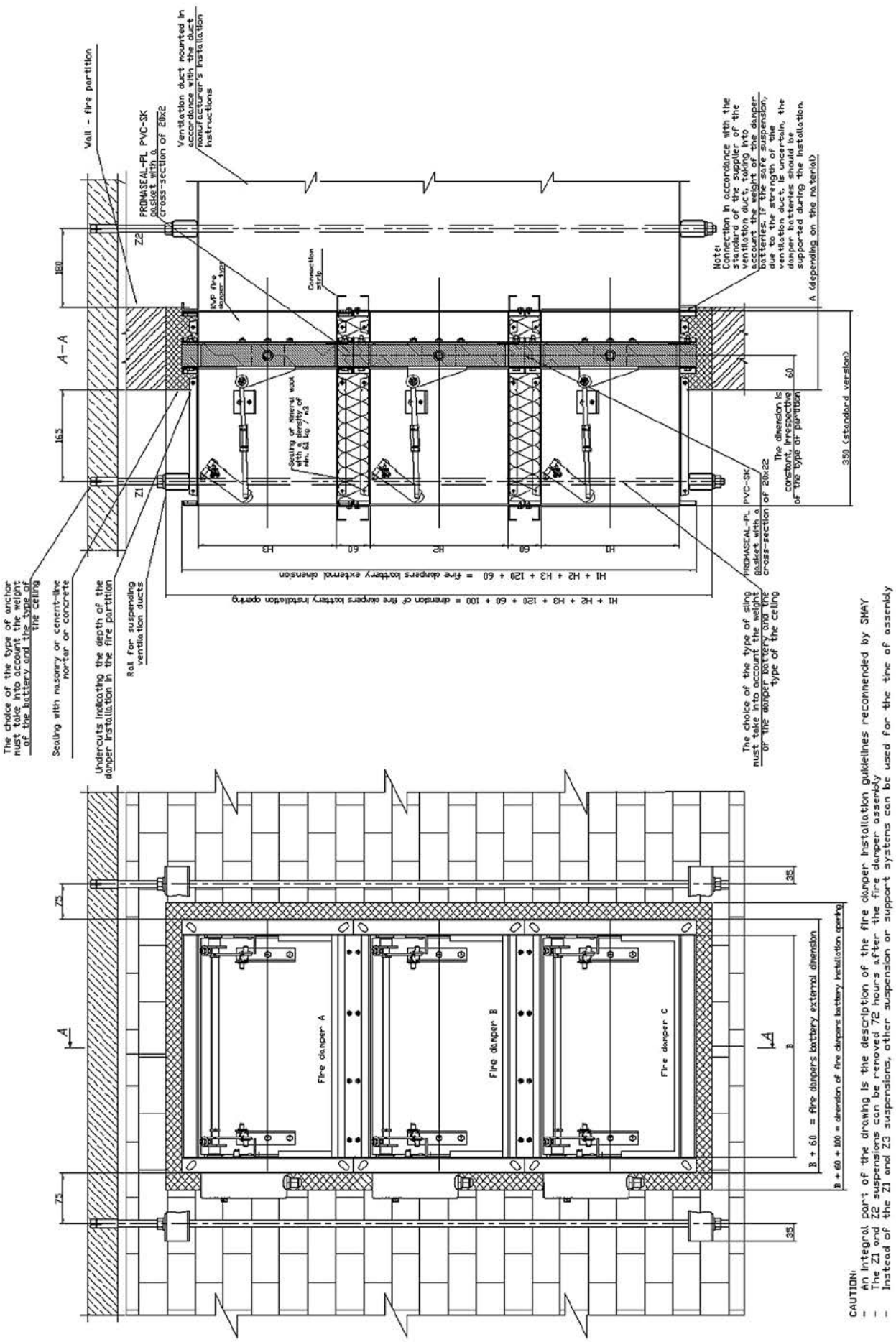

Figure 14. Installation of a battery consisting of three fire dampers LPP in vertical arrangement in ceiling.

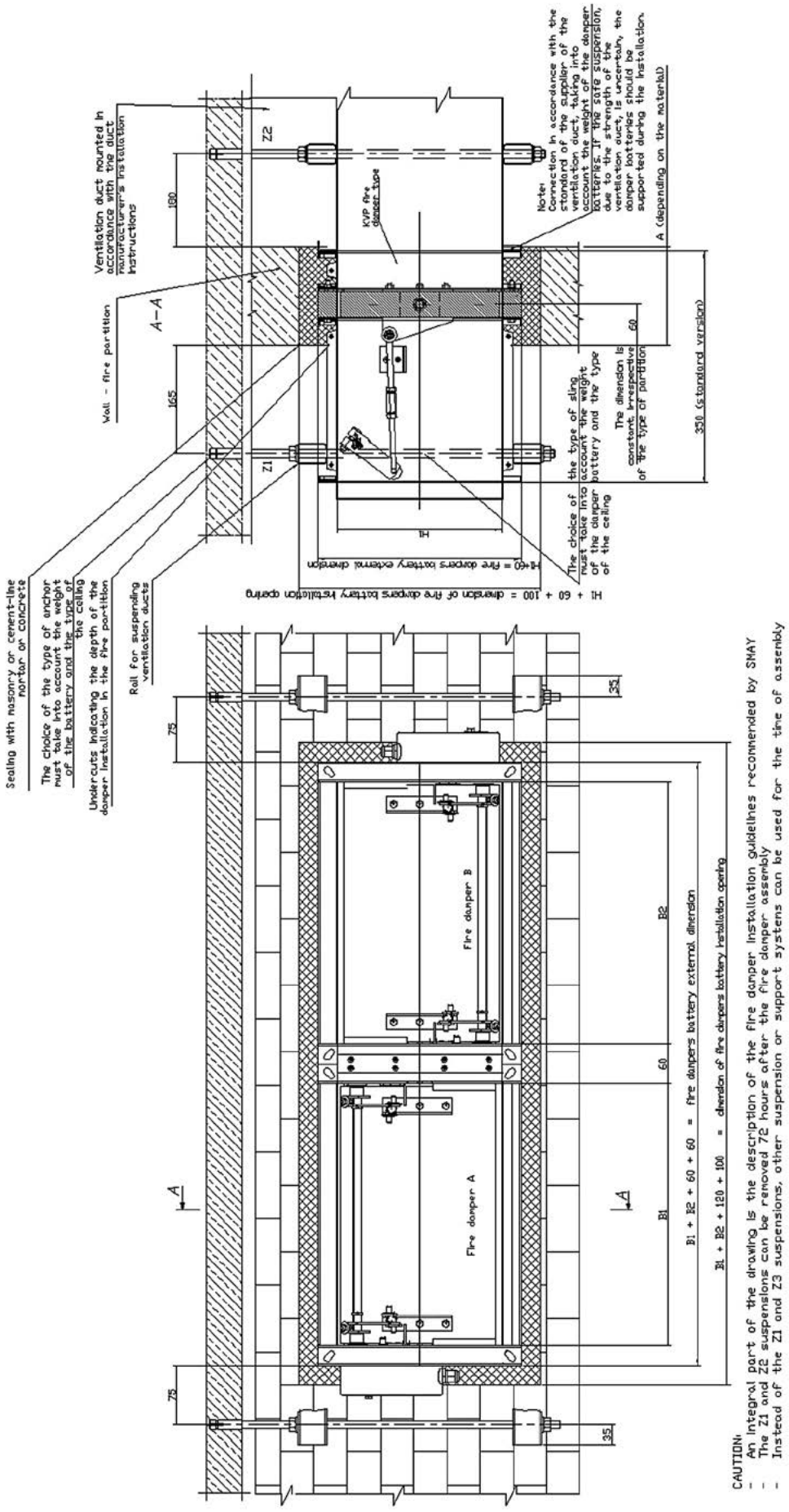

Figure 15. Installation of battery consisting of two fire dampers LPP in horizontal arrangement in ceiling.

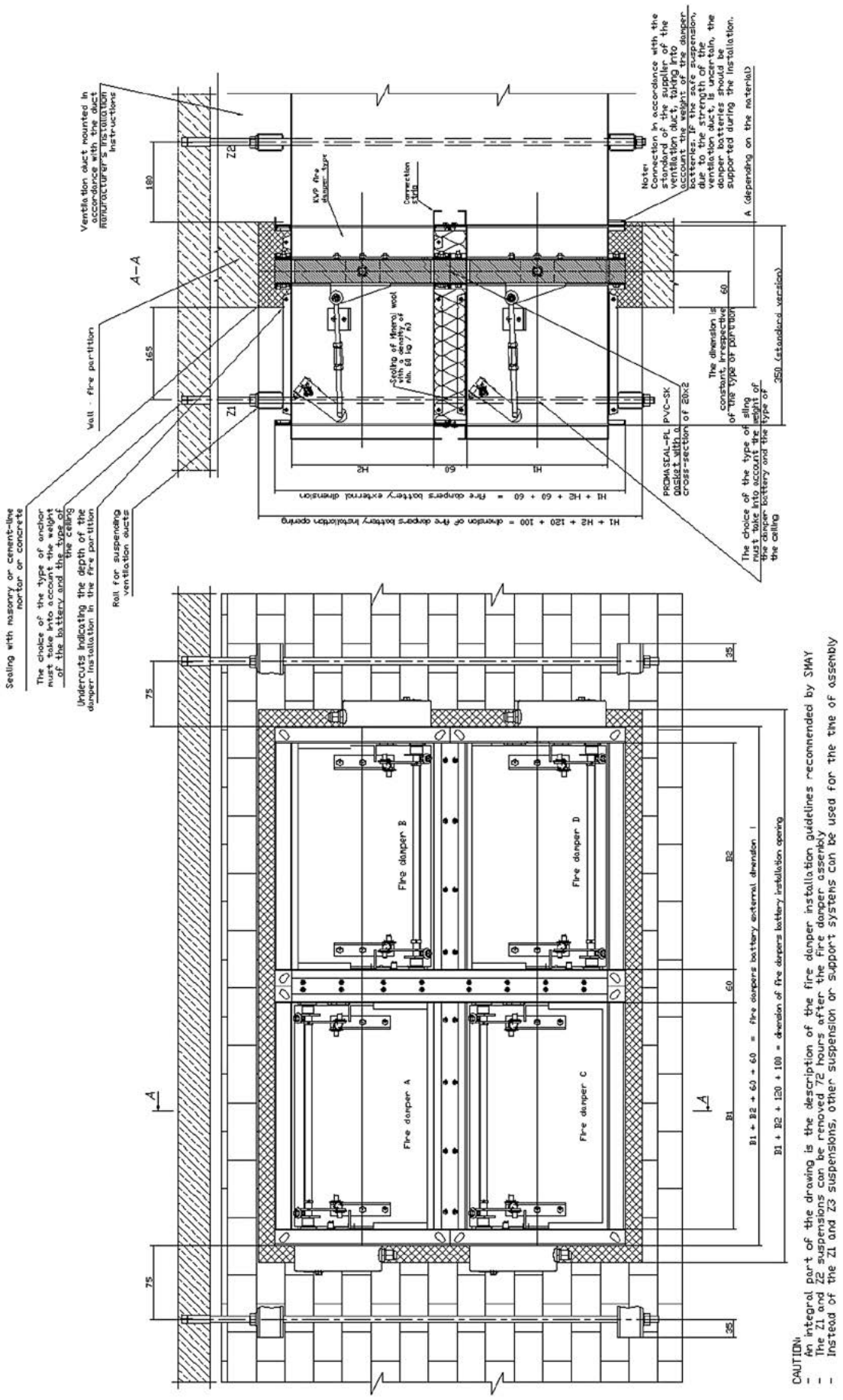

Figure 16. Installation of a battery consisting of four fire dampers LPP in ceiling.

Table 1. Weight of battery made of two LPP dampers [kg]

LPP-E(S)		Bmm - clear LPP damper width													
		200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Height H	200	26,7	31,7	36,6	41,1	46	50,9	55,9	60,8	65,8	70,9	75,9	90,5	96,3	101,9
	300	31,1	36,8	42,9	48,1	54	59,8	65,2	70,8	76,8	82,6	88,4	104,4	110,8	117,4
	400	36	42,5	49,2	55,4	61,7	65,3	75,2	81,7	88	94,8	101,4	118,8	126,2	133,4
	500	-	48,1	55,6	62,8	70,1	77,5	85	92,3	99,9	106,8	114,2	133,4	141,4	149,4
	600	-	53,4	61,7	69,8	78	86,1	94,6	102,7	111	119,3	127,6	147,9	156,8	165,5
	700	-	59	68	76,8	86,2	95,3	104,5	108,7	117,3	131,5	140,5	162,5	172,1	181,9
	800	-	64,4	74,5	83,9	94,2	104	113,9	124,1	133,8	143,8	153,7	177,4	187,9	198,6
	900	-	70,1	80,5	91,1	102	112,6	123,8	134,5	145,1	155,8	167	192,2	206,4	218
	1000	-	-	87	98,3	110,1	121,8	133,6	145,3	156,9	168,3	180,1	209,1	221,5	233,7

Table 2. Weight of battery made of three LPP dampers [kg]

LPP-E(S)		Bmm - clear LPP damper width													
		200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Height H	200	40,1	47,5	54,9	61,7	69,1	76,3	83,5	90,8	98,0	105,2	112,4	134,0	142,5	150,6
	300	46,7	55,2	64,3	72,2	81,0	89,8	97,7	106,2	115,1	123,6	132,0	155,9	165,3	175,0
	400	53,9	63,8	73,7	83,0	92,6	98,0	112,7	122,6	131,9	141,8	152,0	177,7	188,5	199,1
	500	-	72,2	83,5	94,1	105,5	116,2	127,5	138,5	149,9	160,2	171,2	199,8	211,5	223,2
	600	-	80,2	92,6	104,7	117,1	129,2	142,0	154,1	166,5	178,9	191,3	222,0	235,5	248,7
	700	-	88,4	102,0	115,2	14,9	142,9	156,8	163,1	176,0	197,3	211,1	247,6	264,9	282,5
	800	-	96,6	111,8	125,8	141,3	155,9	170,9	186,1	200,7	215,7	230,6	266,0	281,6	297,6
	900	-	104,8	120,8	14,9	152,9	169,0	185,6	201,7	217,7	233,8	250,4	287,6	308,4	325,4
	1000	-	-	130,6	147,5	165,2	182,6	200,4	217,8	235,3	252,5	270,2	313,7	332,2	350,5

Table 3. Weight of battery made made of four LPP dampers [kg]

LPP-E(S)		Bmm - clear LPP damper width													
		200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Height H	200	53,5	63,3	73,2	82,2	92,1	101,7	111,3	120,9	130,5	140,1	149,7	178,5	189,7	200,5
	300	62,2	73,6	85,7	96,3	108,0	119,7	130,2	141,6	153,5	164,7	176,0	207,6	220,0	232,8
	400	71,9	85,1	98,3	110,7	123,5	130,7	150,3	163,5	176,0	189,1	202,7	236,8	251,5	265,8
	500	-	96,2	111,3	125,6	140,2	154,9	170,0	184,7	199,7	213,7	228,4	266,7	282,6	298,4
	600	-	106,9	123,4	139,6	156,1	172,3	189,3	205,5	222,0	238,6	255,1	295,9	313,9	331,4
	700	-	118,0	136,0	153,7	172,1	190,5	209,0	217,4	234,6	263,1	281,5	320,8	339,6	358,7
	800	-	128,9	149,0	167,7	188,4	207,9	227,8	248,1	267,7	287,6	307,5	354,7	375,6	397,0
	900	-	139,9	161,1	19,6	203,9	225,3	247,5	268,9	290,3	311,7	333,8	406,0	442,0	472,7
	1000	-	-	174,1	196,5	220,2	243,5	267,2	290,4	313,7	336,6	360,3	418,1	442,8	467,2