Doc. no. : 301-24-001

DiEM

The Art of Ventilation

Soler&Palau Ventilation Group

ZPP

Multi-blade fire damper

Technical documentation

CE
2434

DIEM, d.o.o.

2434–CPR–0353

EN 15650:2010
Multi-blade fire damper

type: ZPP

Nominal activation conditions/sensitivity: Closing/opening during the test at the right time	Pass
Response time/Closure time:	Pass
Reliability	300 cycles – pass
Fire resistance:	
Fire integrity - E Fire insulation - I Smoke leakage - S Mechanical stability (under E) Maintenance of the cross section (under E)	EI 120 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 60 (v_e i ↔ o) S EI 30 (v_e i ↔ o) S
Durability:	
Response delay: Operating reliability:	Pass

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DIEM reserves the right to make changes to this document.

1. INTRODUCTION

The purpose of technical documentation is to familiarize the user with the intended use, design, operation principle, installation, periodic maintenance and operation of product.

2. LEGAL REGULATIONS

The ZPP dampers are certified with **Certificate of Constancy of Performance no. 2434-CPR-0010**.

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."

3. INTENDED USE

ZPP fire dampers are classified in the following fire resistance range and can be mounted in the following building partitions:

a. EI 120 (v_e i ↔ o) S – horizontal axis of rotation of damper blades. In rigid walls with low density (650±200) kg/m2 or more, with 125 mm thickness or more and with fire resistant class EI 120 or higher (e.g. concrete, masonry of solid brick, cellular concrete blocks or airbricks and prefabricated boards),

b. EI 90 (v_e i ↔ o) S, E 120 (v_e i ↔ o) S – horizontal or vertical axis of rotation of damper blades. In rigid walls with low density (650±200) kg/m2 or more, with 120 mm thickness or more and with fire resistant class EI90 or higher (for dampers with horizontal or vertical axis of rotation of damper blades), EI120 or higher (for dampers with horizontal axis of rotation of damper blades).(e.g. concrete, masonry of solid brick, cellular concrete blocks or airbricks and boards),

c. EI 120 (v_e i ↔ o) S – horizontal axis of rotation of damper blades. In standard walls with 125 mm thickness or more and with fire resistant class EI 120 or higher.

Where:

E – fire integrity,
I – fire insulation,
S – smoke leakage,
120/90 – duration of fulfilment of E, I and S criteria, expressed in minutes,
v_e – damper installed directly in a wall,
h_o – damper installed directly in a celling,
i ↔ o – operating effectiveness criteria are fulfilled from the inside to the outside (fire inside), and from the outside to the inside (fire outside),
o→i – operating effectiveness criteria are fulfilled from the outside to the inside (fire outside).

ZPP fire dampers may be installed without ventilation duct, from one or two sides with mounted honeycomb mesh cover.

ZPP fire dampers may be installed in vertical building partitions with both **horizontal and vertical rotation axis** of baffle, with any actuator location.

ZPP fire dampers are intended for installation on internal and external building partition as also at a distance from them. In case of external wall installation, use of finishing element is required (intake or exhaust) which will protect from influence of atmospheric factors. Drive system (actuator) should be installed inside facility. It is recommended to use dampers in special execution (impregnated fireproof boards, anti-corrosive steel elements).

ZPP fire dampers may also be installed in building partition of a smaller fire resistance. In this case, the damper`s fire resistance is equal to the building partition fire resistance, considering the smoke leakage criterion.

Table 1. Table of fire resistance

Construction type	Minimum thickness of building partition mm	Fire resistance class	Sealing type
Rigid wall	≥120 mm	EI 120 (v_{ew} i ↔ o) S1000 $C_{10.000}$ AAmulti	mortar
	≥120 mm	EI 90 (v_{ew} i ↔ o) S1500 $C_{10.000}$ AAmulti	mortar
Flexible wall	≥125 mm	EI 120 (v_{ew} i ↔ o) S1000 $C_{10.000}$ AAmulti	mineral wool
	≥125 mm	EI 90 (v_{ew} i ↔ o) S1500 $C_{10.000}$ AAmulti	mineral wool
Steel duct	-	EI_{600} 120 (v_{ed} i ↔ o) S1000 C_{300} AAmulti	-

4. TECHNICAL 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.

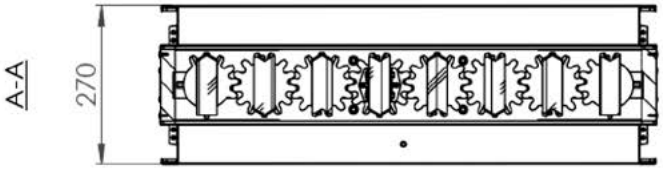
During normal operation of the system, the blades are in the open position. The permissible air velocity for the ZPP damper in a B x H connection duct is 12 m/s.

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

The range of dampers covers the following dimensions: a clear damper width from 200 to 1200 mm (10 mm intervals) and clear damper height from 200 to 800 mm (100 mm intervals).

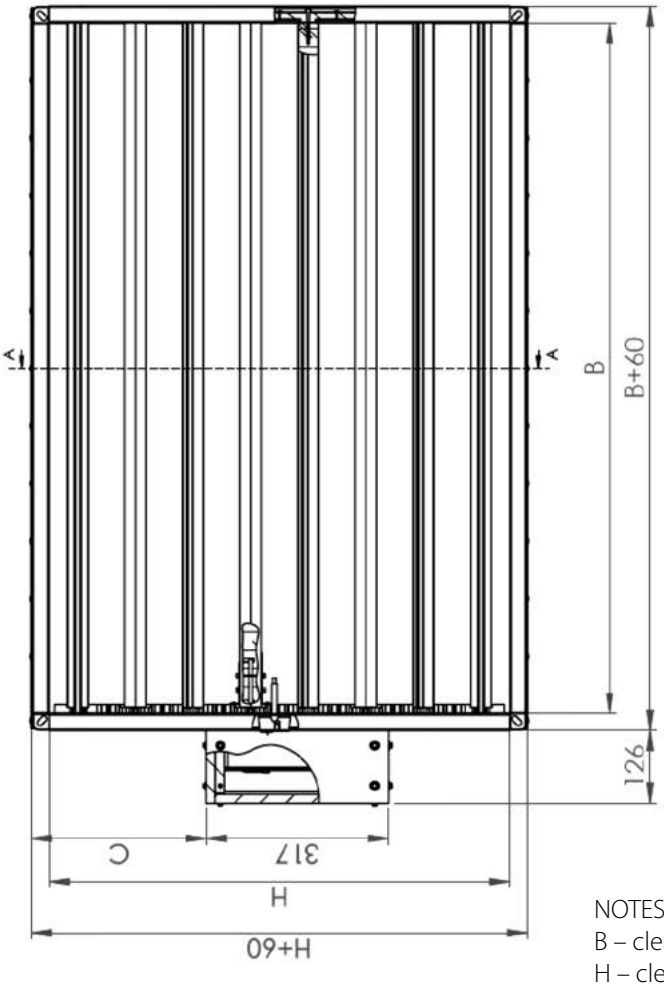
Table 2. ZPP weight [kg]

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



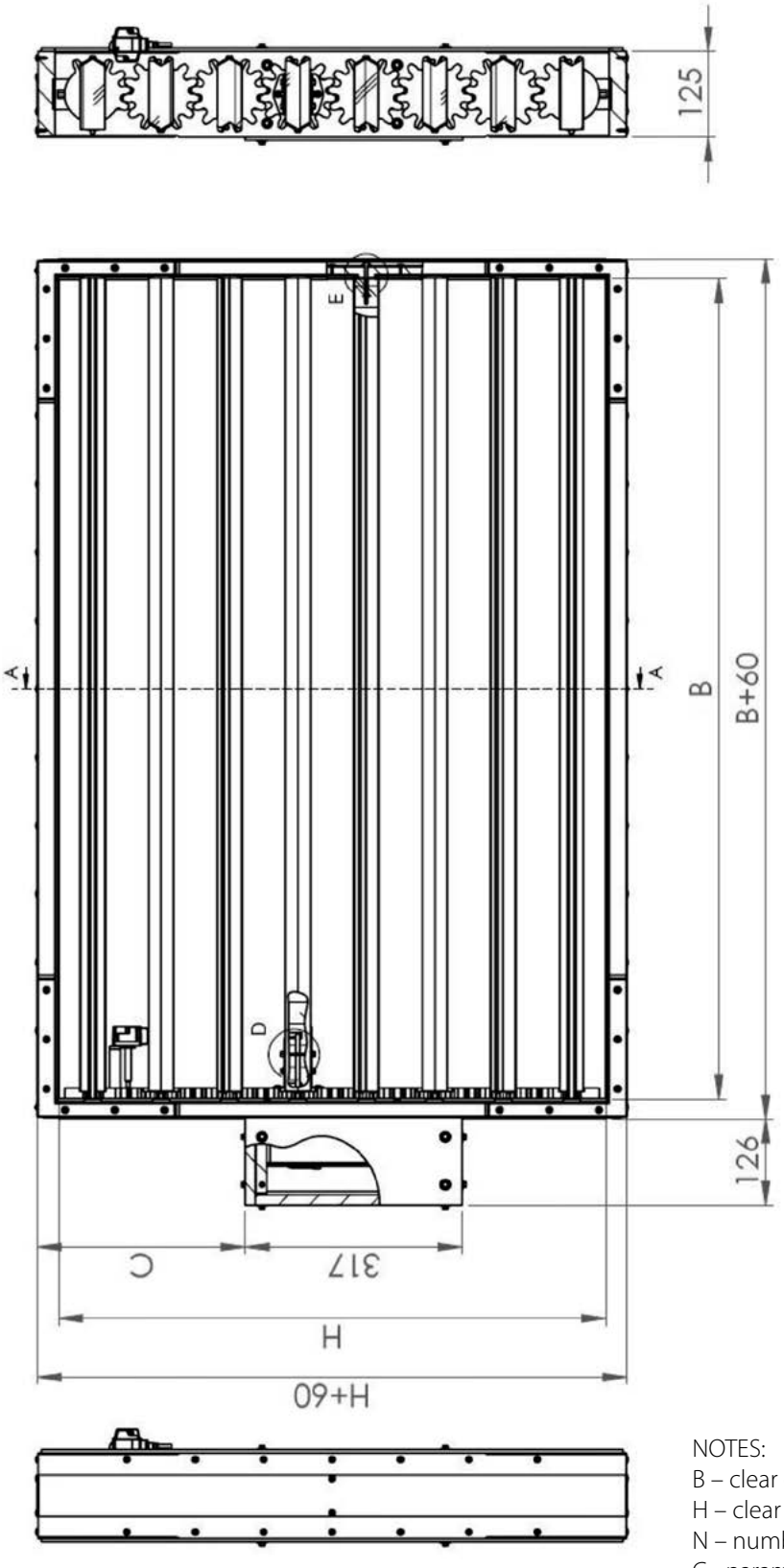
N	C
2	0
3	100
4	100
5	200
6	200
7	300
8	300

Actuators used:
BFN230-T;
BFN24-T;
BF230-T;
BF24-T



NOTES:
B – clear damper width;
H – clear damper height;
N – number of damper blades
C - parameter, select according to the table

Figure 1. ZPP-E-K damper



C	0	100	100	200	200	300	300
N	2	3	4	5	6	7	8

Actuators with thermoelectric tripping device used:
BFN230-T; BFN24-T;
T-BAT 72 or BAT 95 (optional)
BF230-T; BF24-T;
T- BAE 72 or BAE 95 (optional)

NOTES:
B – clear damper width (min. 200 max. 1200);
H – clear damper height (min. 200 max. 800);
N – number of damper blades
C - parameter, select according to the table

Figure 2. ZPP-E-T damper

5. BELIMO ELECTRIC ACTUATORS USED IN ZPP

Spring-return 90° actuator BFN series,
combined with thermoelectric tripping device BAT:

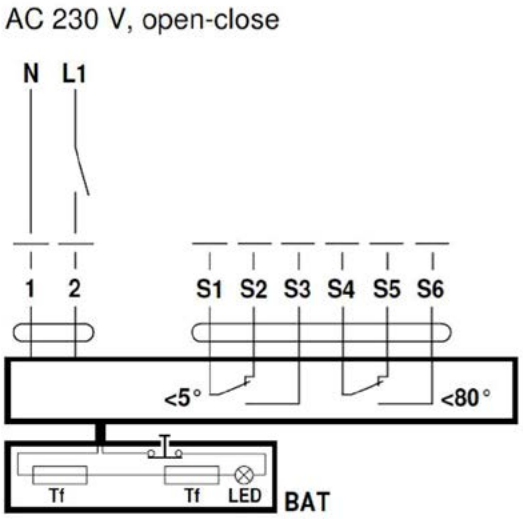
- BFN230-T,
- BFN24-T.

Where: ST – connection plug

Spring-return 90° actuator BF series,
combined with thermoelectric tripping device BAE:

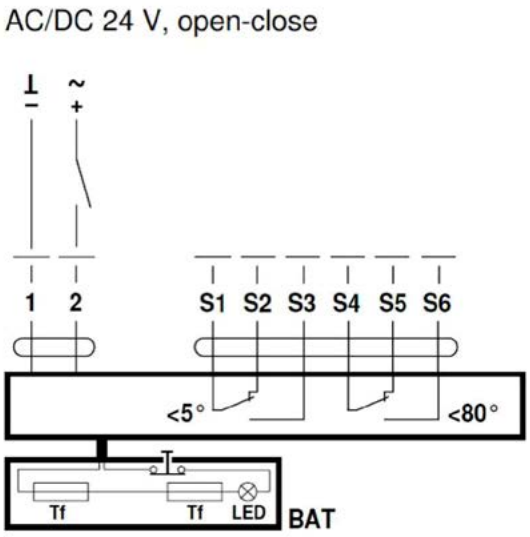
- BF230-TN,
- BF24-TN.

Wiring diagram BFN230-T



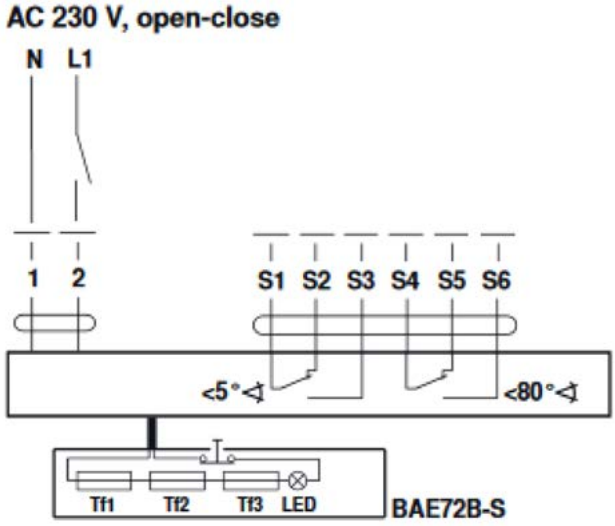
Cable colours:
1 = blue
2 = brown
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey
Tf: Thermal fuse (see "Technical data")

Wiring diagram BFN24-T



Cable colours:
1 = black
2 = red
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey
Tf: Thermal fuse (see "Technical data")

Wiring diagram BF230-T

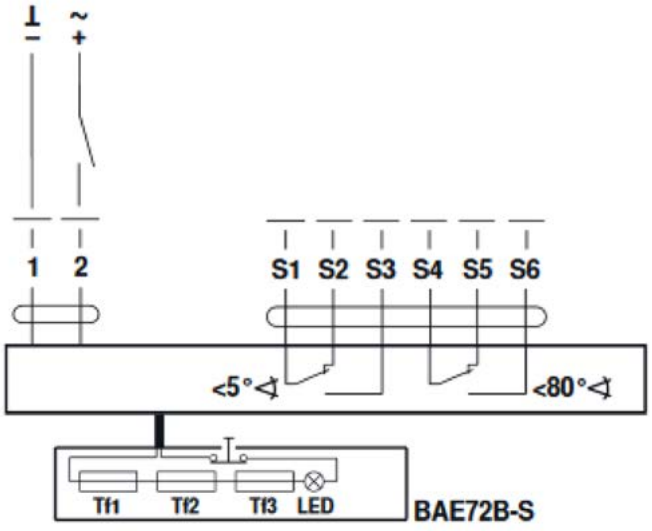


Cable colours:

1 = blue
2 = brown

S1 = white
S2 = white
S3 = white
S4 = white
S5 = white
S6 = white

Wiring diagram BF24-T



Cable colours:

1 = black
2 = white

S1 = white
S2 = white
S3 = white
S4 = white
S5 = white
S6 = white

	Technical data:	BFN230-T
Electrical data	Nominal voltage	AC 230 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 198...264 V
	Power consumption in operation	5 W
	Power consumption in rest position	2.1 W
	Power consumption for wire sizing	10 VA
	Power consumption for wire sizing note	Imax 4 A @ 5 ms
	Auxiliary switch	2 x SPDT
	Switching capacity auxiliary switch	1 mA...3 (0.5 inductive) A, AC 250 V
	Switching points auxiliary switch	5° / 80°
	Connection supply / control	Cable 1 m, 2 x 0.75 mm² (halogen-free)
	Connection auxiliary switch	Cable 1 m, 6 x 0.75 mm² (halogen-free)
	Cable length thermoelectric tripping device	1 m
Functional data	Torque motor	Min. 9 Nm
	Torque spring return	Min. 7 Nm
	Direction of rotation motor	Can be selected by mounting L/R
	Manual override	With position stop
	Angle of rotation	Max. 95°
	Running time motor	<60 s / 90°
	Running time spring-return	20 s @ -10...55°C / <60 s @ -30...-10°C
	Sound power level motor	<55 dB(A)
	Sound power level spring-return	<67 dB(A)
	Spindle driver	Form fit 12x12 mm, Continuous hollow shaft
	Position indication	Mechanically, with pointer
	Service life	Min. 60,000 safety positions
Safety	Response temperature thermal fuse	Duct outside temperature 72°C Duct inside temperature 72°C
	Protection class IEC/EN	II Protective insulated
	Protection class auxiliary switch IEC/EN	II Protective insulated
	Degree of protection IEC/EN	IP54 in all mounting positions
	EMC	CE according to 2014/30/EU
	Low voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1.AA.B
	Rated impulse voltage supply / control	4 kV
	Control pollution degree	3
	Ambient temperature normal operation	-30...55°C
	Ambient temperature safety operation	The safety position will be attained up to max. 75°C
	Non-operating temperature	-40...55°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	1.5 kg

	Technical data:	BFN24-T
Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	4 W
	Power consumption in rest position	1.4 W
	Power consumption for wire sizing	6 VA
	Power consumption for wire sizing note	Imax 8.3 A @ 5 ms
	Auxiliary switch	2 x SPDT
	Switching capacity auxiliary switch	1 mA...3 (0.5 inductive) A, AC 250 V
	Switching points auxiliary switch	5° / 80°
	Connection supply / control	Cable 1 m, 2 x 0.75 mm² (halogen-free)
	Connection auxiliary switch	Cable 1 m, 6 x 0.75 mm² (halogen-free)
	Cable length thermoelectric tripping device	1 m
Functional data	Torque motor	Min. 9 Nm
	Torque spring return	Min. 7 Nm
	Direction of rotation motor	Can be selected by mounting L/R
	Manual override	With position stop
	Angle of rotation	Max. 95°
	Running time motor	<60 s / 90°
	Running time spring-return	20 s @ -10...55°C / <60 s @ -30...-10°C
	Sound power level motor	<55 dB(A)
	Sound power level spring-return	<67 dB(A)
	Spindle driver	Form fit 12x12 mm, Continuous hollow shaft
	Position indication	Mechanically, with pointer
	Service life	Min. 60,000 safety positions
Safety	Response temperature thermal fuse	Duct outside temperature 72°C Duct inside temperature 72°C
	Protection class IEC/EN	III Safety extra-low voltage
	Protection class auxiliary switch IEC/EN	II Protective insulated
	Degree of protection IEC/EN	IP54 in all mounting positions
	EMC	CE according to 2014/30/EU
	Low voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1.AA.B
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature normal operation	-30...55°C
	Ambient temperature safety operation	The safety position will be attained up to max. 75°C
	Non-operating temperature	-40...55°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	1.5 kg

	Technical data:	BF230-T
	Technical data:	**BF230-T**
Electrical data	Nominal voltage	AC 230 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 198 V ... 264 V
	Power consumption in operation	8.5 W
	Power consumption at rest	3 W
	Power consumption for wire sizing	11 VA
	Power consumption for wire sizing note	Imax 0.5 A @ 5 ms
	Auxiliary switch	2 x SPDT
	Switching capacity auxiliary switch	Contact gold-plated silver: 1 mA ... 3 (0.5) A, DC 5 V ... AC 250 V (II Totally insulated)
	Switching points auxiliary switch	5° / 80°
	Connection supply	Cable 1 m, 2 x 0.75 mm² (halogen-free)
	Connection auxiliary switch	Cable 1 m, 6 x 0.75 mm² (halogen-free)
	Cable length thermoelectric tripping device	1 m
Functional data	Torque motor	Min. 18 Nm
	Torque spring-return	Min. 12 Nm
	Direction of rotation motor	Can be selected by mounting L / R
	Angle of rotation	Max. 95° (incl. 5° initial spring tension)
	Running time motor	<120 s / 90°
	Running time spring-return	16 s (tamb = 20°C)
	Sound power level motor max.	45 dB (A)
	Sound power level spring-return max.	63 dB (A)
	Damper rotation	Form fit 12 mm (10 mm with enclosed adapter)
	Position indication	Mechanically, with pointer
	Service life	Min. 60,000 safety positions
Safety	Response temperature thermal fuse	Tf1: Duct outside temperature 72°C Tf2 and Tf3: Duct inside temperature 72°C
	Protection class IEC/EN	II Totally insulated
	Degree of protection IEC/EN	IP54 in all mounting positions
	EMC	CE according to 2014/30/EU
	Low-voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	Certified according to IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1.AA.B
	Rated impulse voltage supply / control	4 kV
	Control pollution degree	3
	Ambient temperature normal duty	-30°C ... 50°C
	Ambient temperature safety duty	The safety position will be attained up to max. 75°C when triggered by a thermal fuse
	Non-operating temperature	-40°C ... 50°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight approx.	3.1 kg

	Technical data:	BF24-T
Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2 V ... 28.8 V / DC 21.6 V ... 28.8 V
	Power consumption in operation	7 W
	Power consumption at rest	2 W
	Power consumption for wire sizing	10 VA
	Power consumption for wire sizing note	Imax 8.3 A @ 5 ms
	Auxiliary switch	2 x SPDT
	Switching capacity auxiliary switch	Contact gold-plated silver: 1 mA ... 6 (3) A, DC 5 V ... AC 250 V (II Totally insulated)
	Switching points auxiliary switch	5° / 80°
	Connection supply	Cable 1 m, 2 x 0.75 mm² (halogen-free)
	Connection auxiliary switch	Cable 1 m, 6 x 0.75 mm² (halogen-free)
	Cable length thermoelectric tripping device	1 m
Functional data	Torque motor	Min. 18 Nm
	Torque spring-return	Min. 12 Nm
	Direction of rotation motor	Can be selected by mounting L / R
	Angle of Rotation	max. 95° (incl. 5° initial spring tension)
	Running time motor	<120 s / 90°
	Running time spring-return	16 s (tamb =20°C)
	Sound power level motor max.	45 dB (A)
	Sound power level spring-return max.	63 dB (A)
	Damper rotation	Form fit 12 mm (10 mm with enclosed adapter)
	Position indication	Mechanically, with pointer
	Service life	Min. 60,000 safety positions
Safety	Response temperature thermal fuse	Tf1: Duct outside temperature 72°C Tf2 and Tf3: Duct inside temperature 72°C
	Protection class IEC/EN	III Safety extra-low voltage
	Degree of protection IEC/EN	IP54 in all mounting positions
	EMC	CE according to 2014/30/EU
	Low-voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	Certified according to IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1.AA.B
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature normal duty	-30°C ... 50°C
	Ambient temperature safety duty	The safety position will be attained up to max. 75°C
	Non-operating temperature	-40°C ... 50°C
	Ambient humidity range	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight approx.	2.8 kg

6. ACCESSORIES FOR ZPP DAMPERS

ZPP dampers can be used as transfer dampers with use of KST type grilles with horizontal or vertical lamellas or with use of MKW flat or convex honeycomb mesh cover.

Both products are used to prevent the damper from colliding with unwanted objects, covering sensitive moving parts.

MKW mesh covers have openings similar to a honeycomb. There are two types of mesh cover (honeycomb mesh cover):

a. MKW-B – short (flat) installed in wall on the side of thermal fuse

b. MKW-D – tall (convex), installed in wall on the side of the protruding thermal fuse.

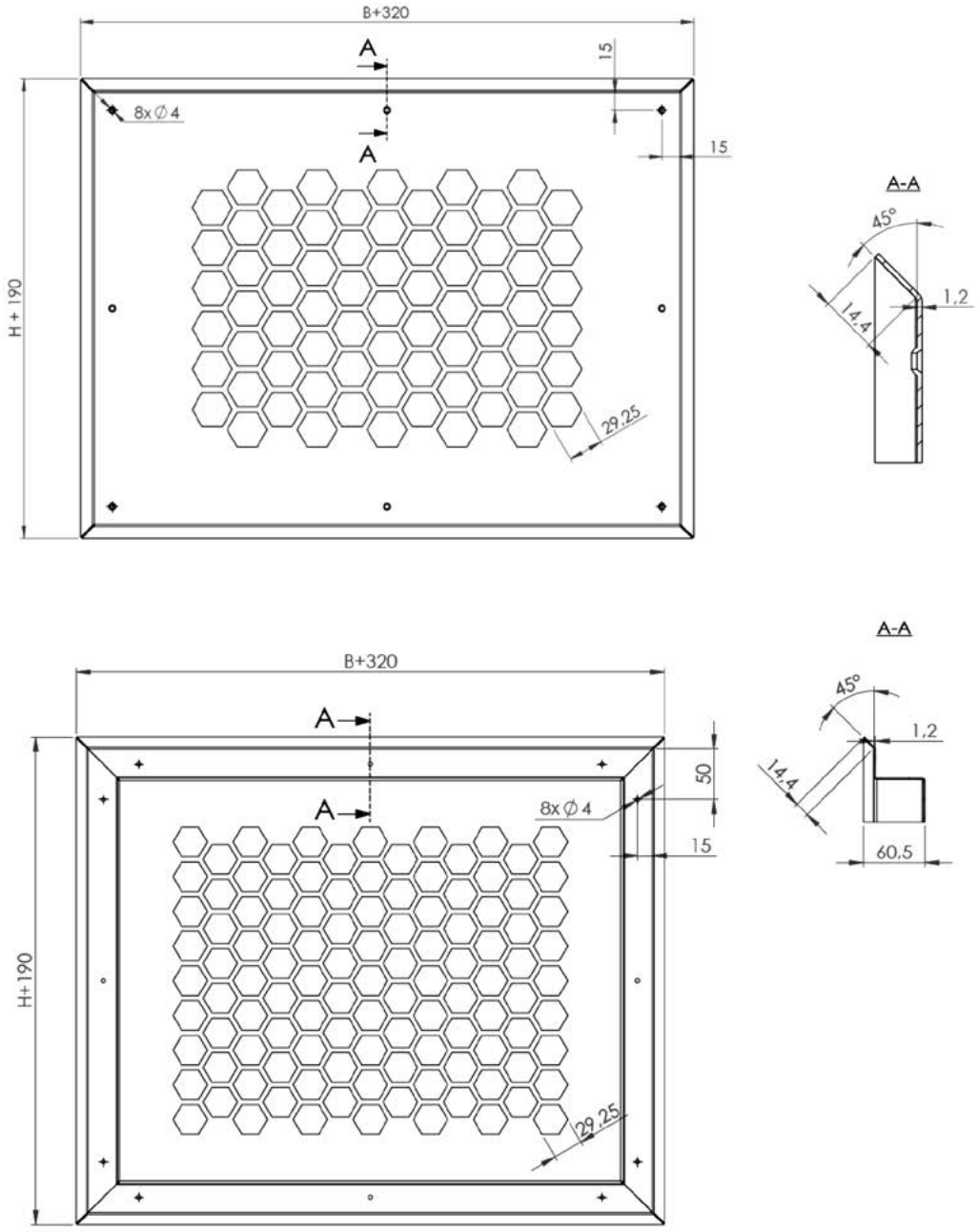


Figure 4. MKW-D (convex) honeycomb mesh cover

The honeycomb mesh cover are made in the following series of types according to their width*

B of the damper	B of the mesh cover
200-250	570
251-300	620
301-350	670
351-400	720
401-450	770
451-500	820
501-550	870
551-600	920
601-650	970
651-700	1020

B of the damper	B of the mesh cover
701-750	1070
751-800	1120
801-850	1170
851-900	1220
901-950	1270
951-1000	1320
1001-1050	1370
1051-1100	1420
1101-1150	1470
1151-1200	1520

* In a special version, the honeycomb mesh cover can be made with dimensions different from the typical ones.

7. CONDITIONS OF TRANSPORT AND STORAGE

ZPP should be stored in cardboard boxes and/or on pallets. ZPP should have a pre-protected actuator cardboard box. Fire dampers should be stored indoors, providing protection against atmospheric agents, at a minimum temperature of +5 °C.

Do not allow mechanical damage of damper, that may be caused e.g. blows or dropping.

During the transport the dampers should be package in cardboard, and/or put on a pallets and should be secured before relocating, and against weather conditions. Be especially careful particularly with the ZPP-E-T type dampers. After each transport, visual inspection of each fire damper must be carried out.

8. INSTALLATION TECHNOLOGY

Before installing the fire dampers, make sure that there are no damage, during transport or storage, that could block the baffle.

Check that the baffle can be opened and closed (full opening and closing position). To open fire dampers ZPP use the actuator key.

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

Do not pull by baffle to open or close fire damper, it may cause permanent damage, not covered by the warranty. Before installation verify dimensions of the gap between bottom blade and inside part of the housing under the blade, and between top blade and inside part of housing above blade. The dimension of the gap cannot be lower than 4 mm. Before installing, secure the fire damper, by dust and dirt, using a foil or other screening material. It can prevent components of fire damper by damage.

Dampers to preserve of the declared resistance, insulation and smoke leakage EIS120, EIS90, should be installed on wall, which was classified as EIS120, EIS90.

It is allowed to install ZPP dampers in wall with other fire-resistance, should be remembered that fire-resistance in this situation is resistance of lowest classified (in this regard) element in this system.

Ducts made of flammable and non-flammable materials can be connected to the damper. Ducts should be installed that they cannot load the damper during fire. Ducts lengthening during fire can be compensated by support and knee. ATTENTION: Distance between fire dampers or fire damper and construction elements must be compatible with standard 1366-2:

a. Minimal 200 mm between fire damper, which are installed in different ventilating wires,

b. Minimal 75 mm between fire damper and construction element (wall/ceiling).

8.1. INSTALLATION TECHNOLOGY – RIGID WALL

a. Make an opening in the wall 230 [mm] (acceptable 210 ÷ 250 [mm]) greater than the dimension B and 100 [mm] (acceptable 80 ÷ 120 [mm]) greater than the dimension H, that is B+230 and H+100.

b. For the dampers which have height H=200 mm and H=300 mm installation opening should have height H+160 [mm] (acceptable 140÷180 [mm]).

c. Put the closed fire damper into the installation opening and support or suspend, in this way that the axis of the fire damper baffle matches the axis of the wall, and ensure a concentricity of fire damper and installation opening. The damper should be protected against possible undesirable stresses, which could lead to deflection of the housing, e.g. by using assembly struts.

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.

e. After drying of the mortar (approx. 48 hours), remove used supports or suspensions, check the fire damper correct operation and leave it in fully open position.

In order to avoid filling the holes above and below the actuator housing, the opening for the ZPP damper can be made as shown in the figure below.

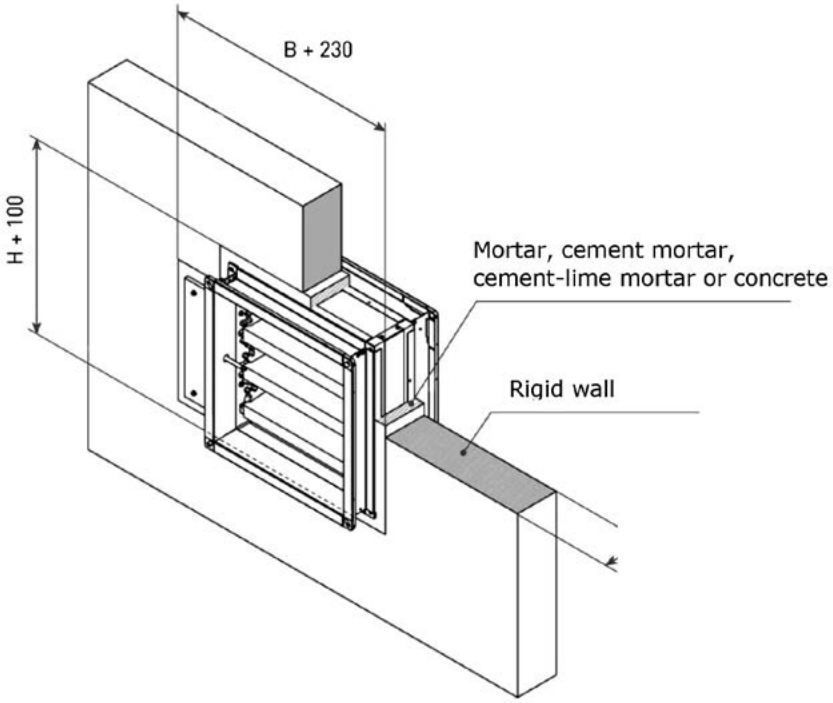


Figure 5. Dimensions of the installation opening of the ZPP dampers in rigid wall with a horizontal and with vertical axis of rotation of the baffle, with planned cut for actuator housing. The C dimension is given in the table.

N	C
2	0
3	100
4	100
5	200
6	200
7	300
8	300

N – number of blades in damper

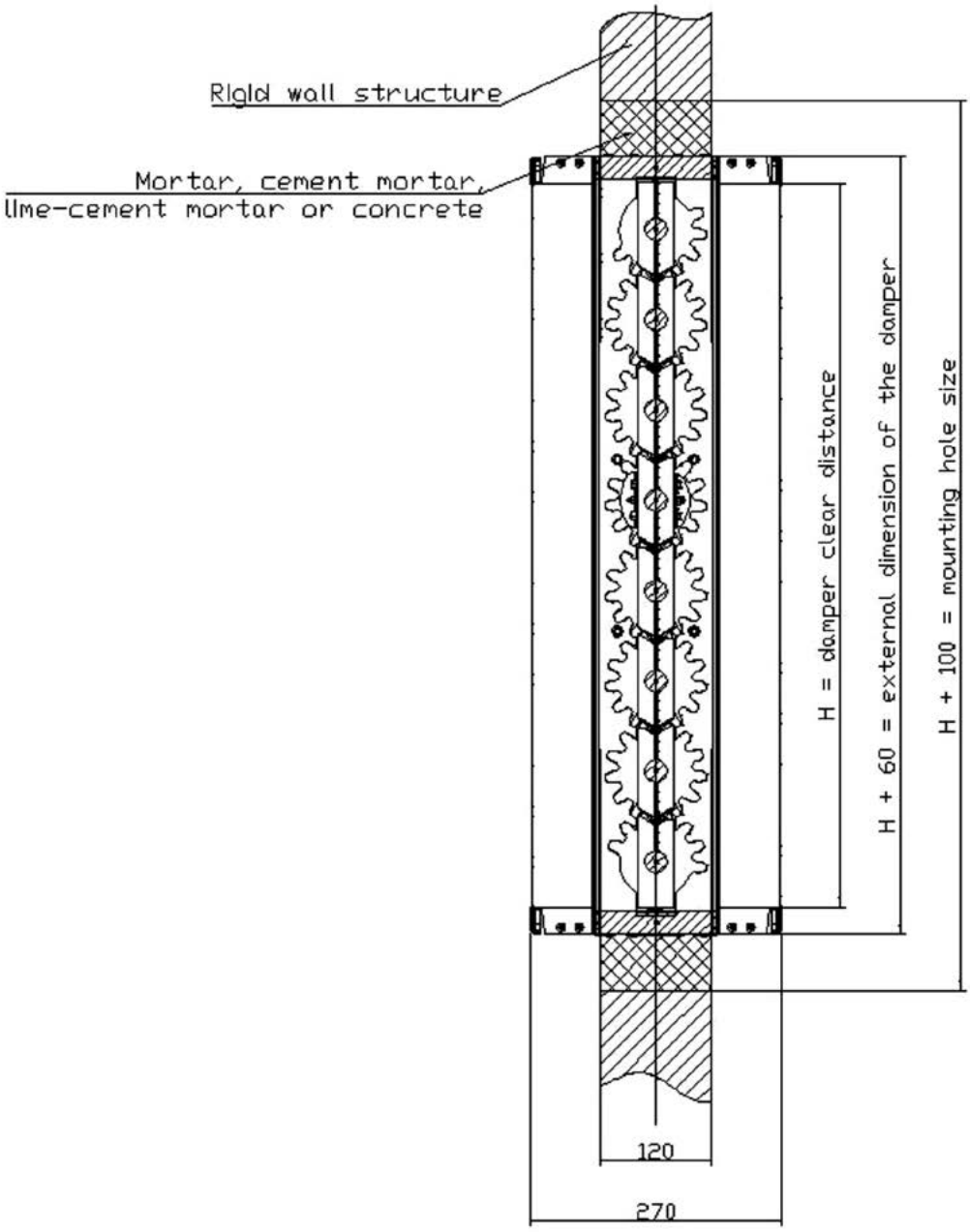


Figure 6. Installing method of ZPP fire dampers in rigid wall

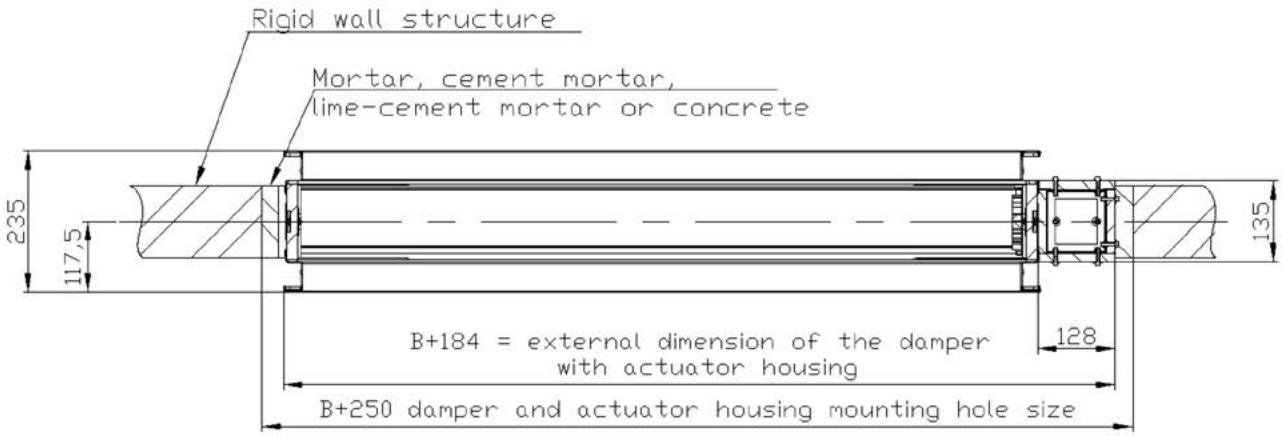


Figure 7. Installing method of ZPP fire dampers in rigid wall

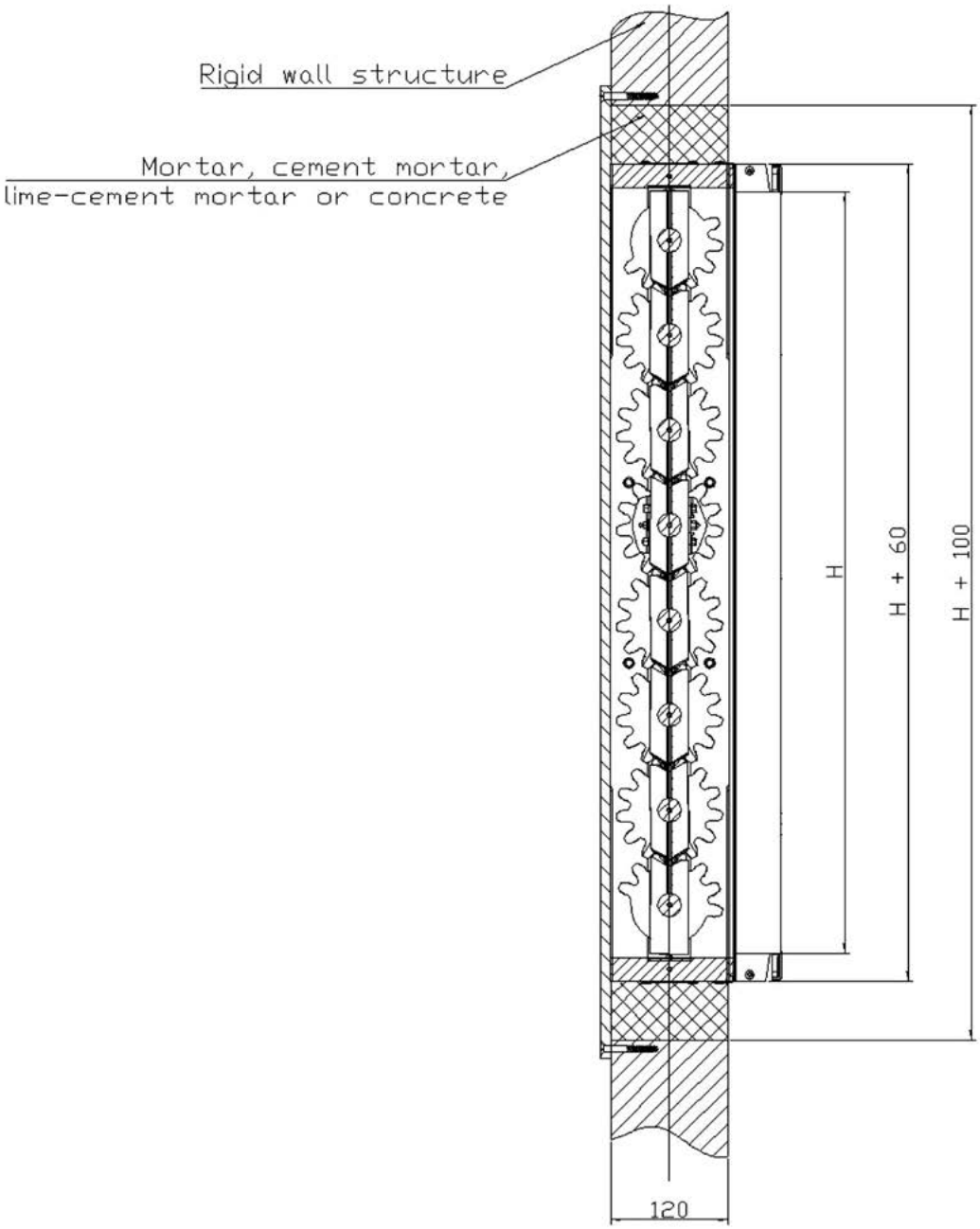


Figure 8. Installing method of ZPP fire dampers in rigid wall with KST grille in rigid wall structure

8.1.1. PROMADUCT CHANNEL

After setting the fire damper as described, and build it in wall, duct made of PROMATECT-L500 boards with 50 mm thickness must be installed. The band around the duct must be made by PROMATECT-L500, with 50 mm thickness and

60 mm width. Connection of damper and the wall, and damper with the band must be made by K84 glue. The sides of the duct and the band must be connected by using 4,2 x 90 – 4,8 x 120 screws.

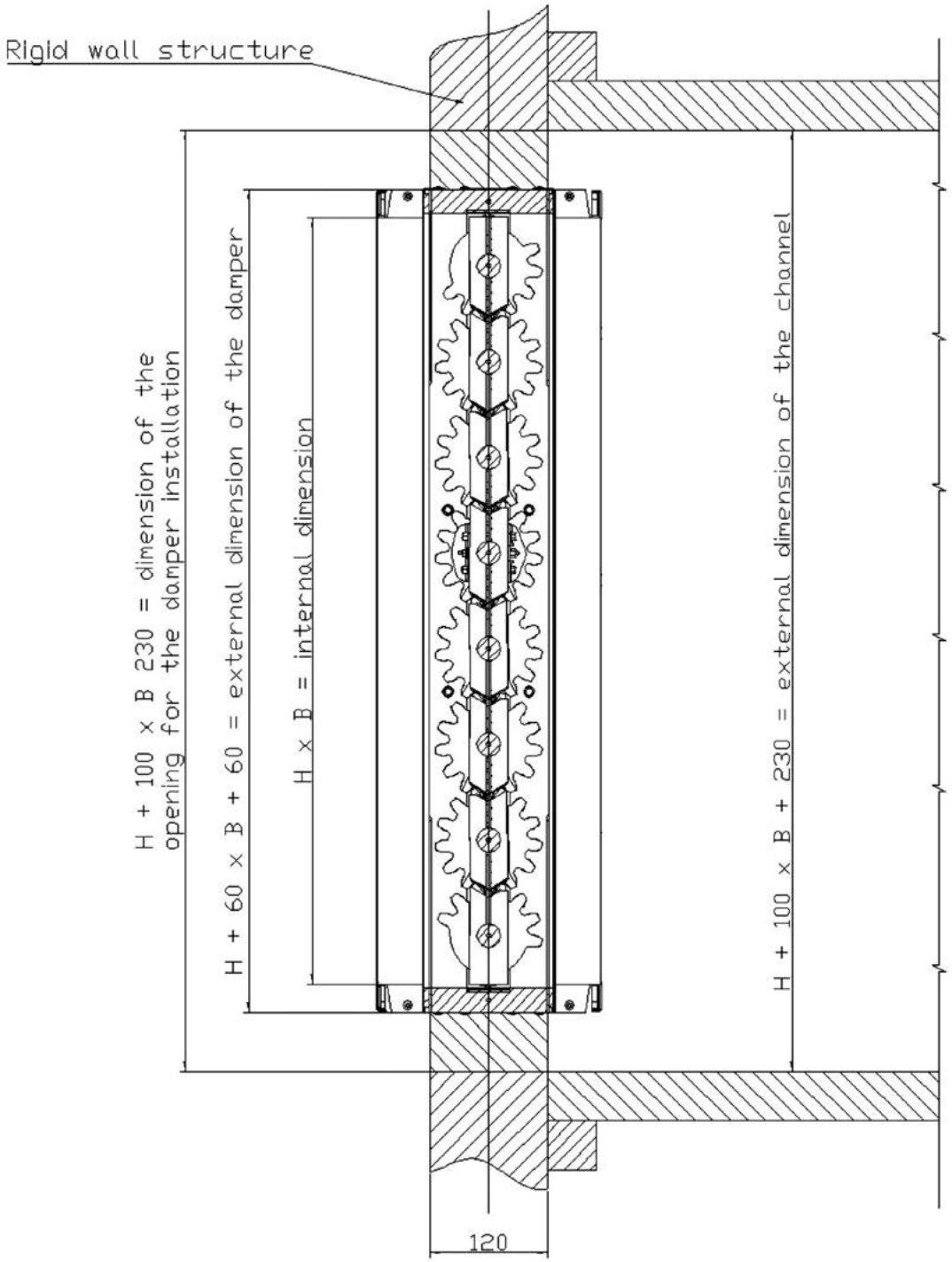


Figure 9. Installing method of ZPP fire dampers with PROMAT boards duct.

8.2. INSTALLATION TECHNOLOGY – STRUCTURES THICKER THAN 125 mm

In rigid walls, with thickness less than or equal to 125 mm, ZPP fire dampers are installed in this way that an axis of the fire baffle matches the axis of the wall, and ensure a concentricity of fire damper and installation opening.

In case when wall have more than 125 mm thickness: ZPP fire dampers are installed in this way that the damper border is flush with the wall surface (Fig. 6).

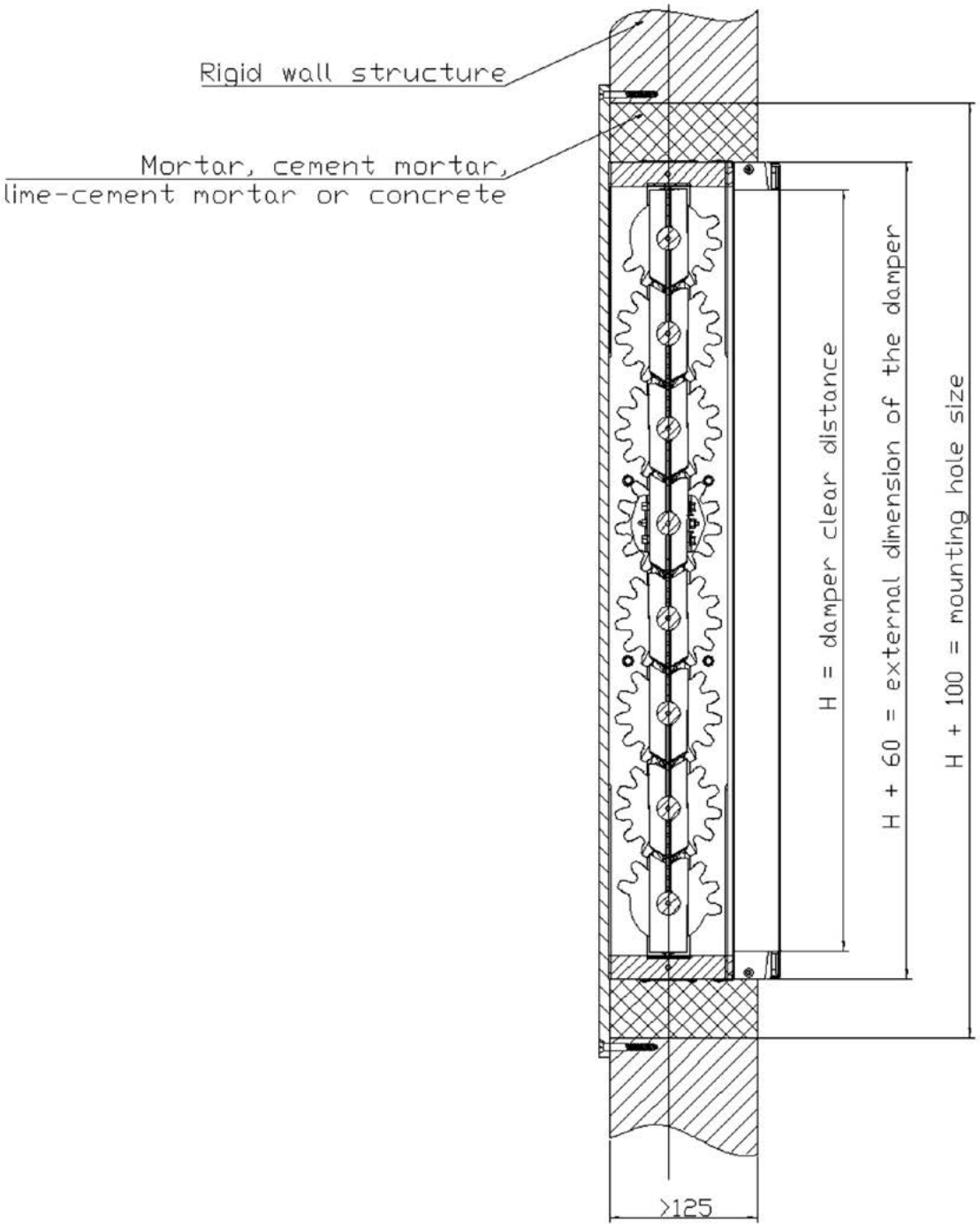


Figure 10. Installation method of fire dampers ZPP in structures thicker than 125 mm.

8.3. INSTALLATION TECHNOLOGY – LIGHT WALL

a. Make an opening in the wall with the dimensions 230 [mm] (acceptable 210 ÷ 250 [mm]) greater than the dimension B and 100 [mm] (acceptable 80 ÷ 120 [mm]) greater than the heigh H, That is B+230 i H+100.

b. For the dampers which have height H=200 mm and H=300 mm installation opening should have height H+160 [mm] (acceptable 140÷180 [mm]).

c. Make a frame of two layers of GKF boards 15 mm thick and the width relative to the width of opening, mounting by screws remembering to carefully seal the contact edges with a mastic: Hilti Firestop Coating CP 673, Promas-top-Coating, Promaseal-Mastic or Soudal Firesilicone B1 FR.

d. Put the closed fire damper into the installation opening and support or suspend, in this way that an axis of the fire baffle matches the axis of the wall, and ensure a concentricity of fire damper and installation opening.

e. 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, 100 kg/m3 or more.

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

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

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

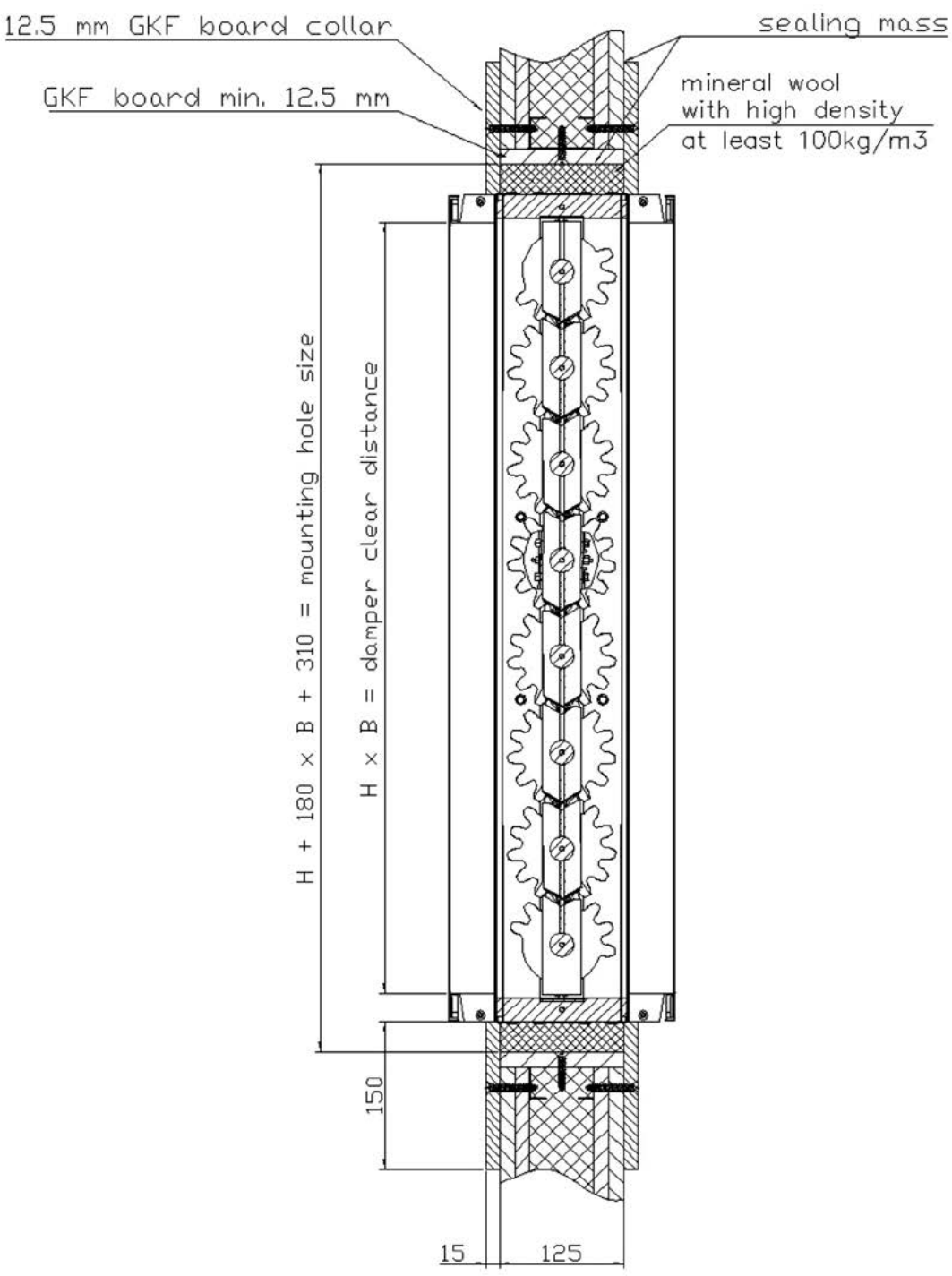


Figure 11. Installation method of fire dampers ZPP in standard wall with 125 mm thick.

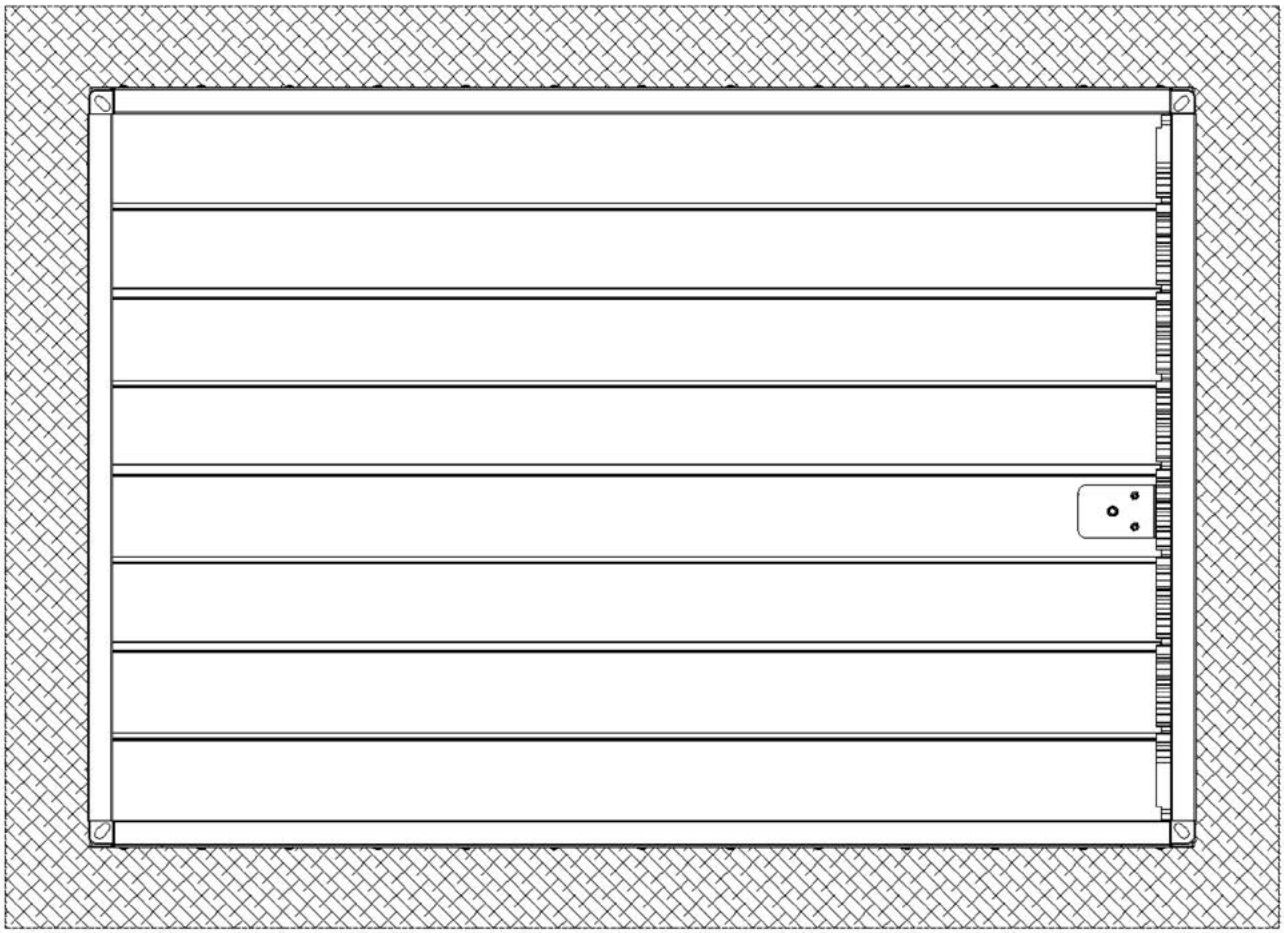


Figure 12. Installation method of fire dampers ZPP in standard wall.

8.4. INSTALLATION TECHNOLOGY – MKW HONEYCOMB MESH COVER

In rigid walls, with thickness less than or equal to 125 mm, ZPP fire dampers are installed in this way that an axis of the fire baffle matches the axis of the wall, and ensure a concentricity of fire damper and installation opening.

In case when wall have more than 125 mm thickness: ZPP fire dampers are installed in this way that the damper border is flush with the wall surface (Fig. 6).

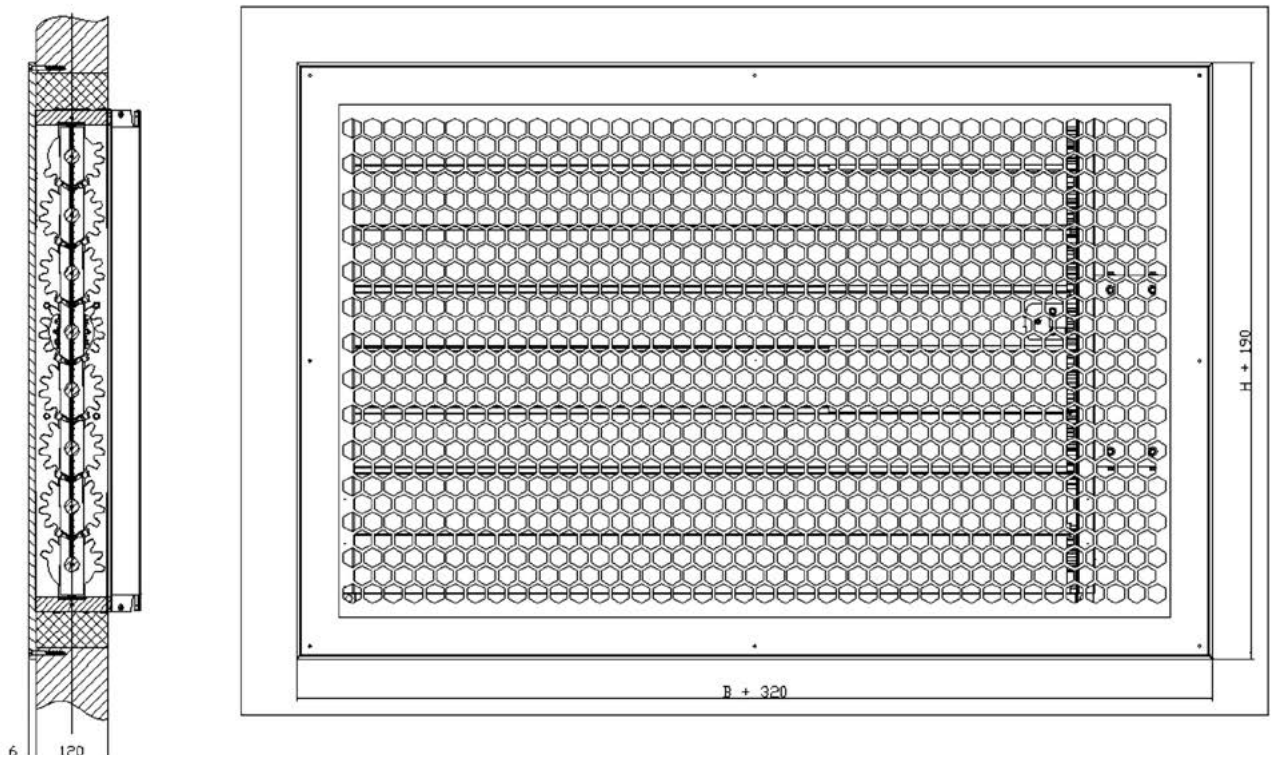


Figure 13. Installation method of MKW-B honeycomb mesh cover.

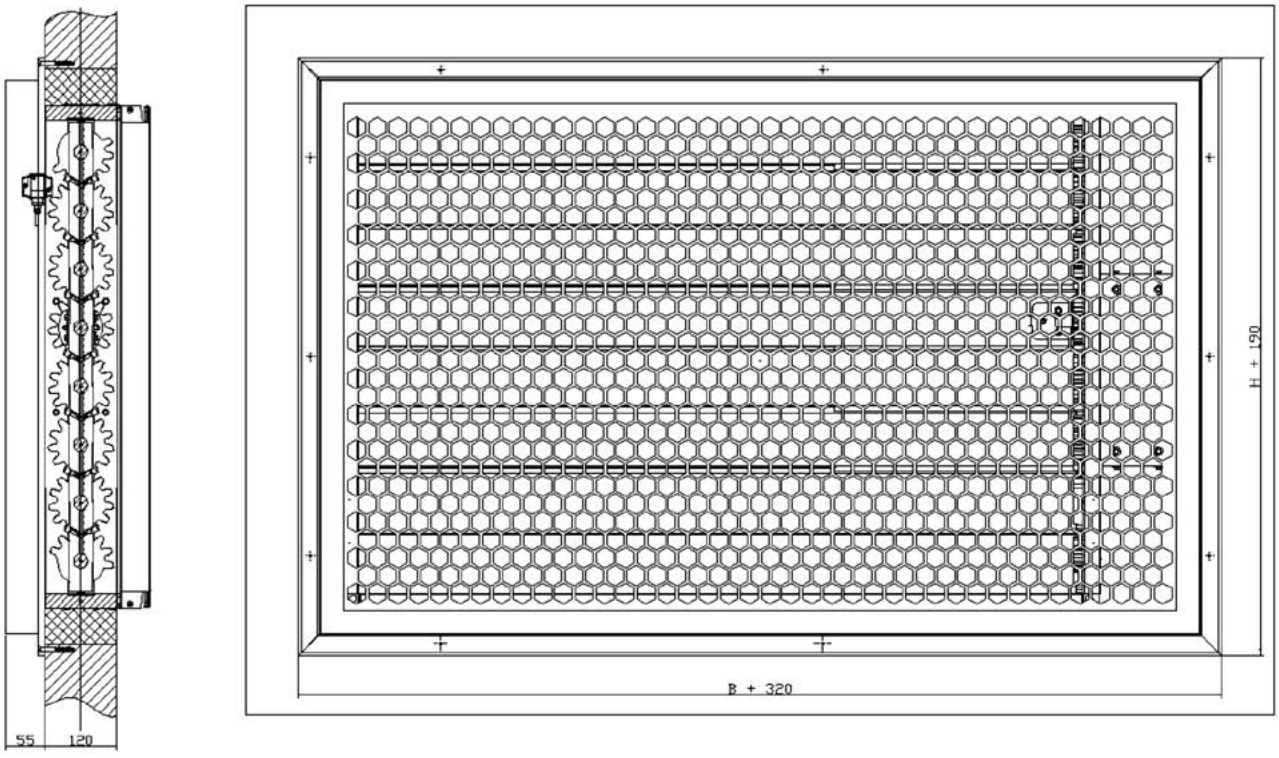


Figure 14. Installation method of MKW-D honeycomb mesh cover.

9. PRINCIPLES OF MAINTENANCE

Before started any operation and maintenance works it is recommended to read this documentation. This responsibility falls mostly on workers which will operate device/systems during operation and service works. In case of lack of trained personnel (which have specific technical skills) service works should be made by DIEM Service or DIEM Authorized service.

Damage to the ZPP damper resulting from non-compliance with the guidelines included in this documentation, will not be subject to warranty repairs.

Exchange and modification of device components can be done, just by DIEM Service or DIEM Authorized service (does not apply to exchange thermal fuse).

Factory sealed elements, should have undamaged, original seals, installed by DIEM Service or DIEM Authorized service.

After installation of the ZPP fire damper, when running the system, it is recommended to carry out regular checks and record them as shown in table below. It is recommended to repeat checks at intervals or at least once every 6 months.

Table 3. Recommended checks

Fire damper type	
Control date	
Check actuator wiring condition, if doesn`t damaged	
Check limit switch wiring condition, if doesn`t damaged	
Check cleanliness in fire damper, clean if necessary	
Check baffle and seal condition, if necessary, report a problem	
Confirm correct operation of safe shutdown of the fire damper, if necessary, report a problem	
Confirm correct operation of the fire damper when OPEN and CLOSE, using the control system and physical observation	
Confirm correct operation of limit switches in OPEN and CLOSED positions, if necessary, report a problem	
Confirm that the fire damper meets its function as a part of the control system	
Confirm that the fire damper remains its working position	
ATTENTION: Fire dampers are usually part of ventilation system. In this case, the entire system should be checked according to the operating and maintenance requirements.	

To make an inspection and check the condition of the drive system, an inspection opening should be planned in ventilation duct.

Fire damper can be cleaned with a dry or damp cloth. Dirt and other pollution can be cleaned with generally available cleaners. Do not use aggressive, caustic cleaners and sharp tools.

In order to check the proper functioning of fire damper, in particular:

a. Make a visual inspection of the interior of fire damper, determine the condition of the baffle and seal, whether there are no damage or dirt that could block the fire baffle during closing.

b. Check the fire damper without disconnecting the supply voltage from the actuator.

c. The opening and closing test should be carried out by positioning the baffle from control system ("open" and "closed" position read on the position indicator located on the actuator).

d. After doing the above, leave the fire damper in the open position.

e. Make a control protocol.

Table 4. Diagnostic card

Diagnostic card			
No.	**Symptoms of malfunction**	**Causes of malfunction**	**How to remove malfunction**
1	No signaling opening/closing fire damper.	1. Failure to fully open the baffle (wrong connected ventilation duct). 2. Improperly connected wires of limit switch. 3. Damaged actuator.	1. Removing the cause of blocking baffle. 2. Correct wiring. 3. Replacing the actuator with a new one (after consulting with fire damper`s manufacturer).
2	No actuator response after connecting power.	1. Damaged actuator. 2. Damaged temperature sensor. 3. Locked baffle.	1. Replacing the actuator with a new one (after consulting with fire damper`s manufacturer). 2. Replacing the temperature sensor to a new one. 3. Removing the cause of blocking baffle.
3	No possibility of opening the fire damper with actuator by key.	1. Broken mechanism in the actuator (too rapid rotation). 2. Locked baffle.	1. Replacing the actuator with a new one (after consulting with fire damper`s manufacturer). 2. Removing the cause of blocking baffle.

10. TERMS OF WARRANTY

a. The manufacturer provides guarantee for the delivered product for a period of 24 moths from the date of sale or another period agreed in the contract. There is a possibility of extending the guarantee, provided that a separate Maintenance and Service Agreement is signed between the manufacturer and the owner/manager of the facility.

b. The basis for complaint handling is to file a complaint within the warranty period, within 7 days of the detect being discovered. Make the product available in the state in which it appeared to be defective, together with a detailed description of the technical problem and documents confirming the performance of any inspection provided by the manufacturer and periodic maintenance.

c. The manufacturer undertakes to remove the defect within 2 working days of receiving the notification. The manufacturer undertakes to remove the defect within 21 working days from the date of receipt of the application together with the complete set of documents, and in the case of necessity to bring in hard-to-reach materials or parts, the repair will be carried out within the shortest technically reasonable time.

d. The warranty period is extended by the duration of the repair.

e. The warranty is valid in the cases described in the OWG.

f. OWG & OWS documents are available on the website www.diem.si

g. Above terms of warranty apply only in Slovenia.