

# MANDÍK<sup>®</sup>

## INSTALLATION INSTRUCTIONS

### FIRE DAMPER FDMA



FIRE damper type FDMA, is in all variants classified:  
 as **EI 120 ve, ho (i↔o) S** or **EI 90 ve, ho (i↔o) S** acc. EN 13501-3 and tested acc. EN 1366-2 and acc. EN 15650.

## Examples of installation Round fire dampers (damper blade inside fire separating construction)

Installation in a solid wall construction

### EIS 120 EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Solid wall construction
- 3 Mortar or gypsum

**Notice:** The requirement to EIS 120 must be specified in the order alone. Without specification is supplied the standard flap EIS 90.

Installation in a solid wall construction

### EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Solid wall construction
- 3 Stuffing box (mineral stone wool min. density 140 kg/m<sup>3</sup>)
- 4 Fire protection mastic min. thickness 1 mm
- 5 Cement lime plate min. thickness 15 mm

Installation in a solid wall construction (Weichschott system)

### EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Solid wall construction
- 3 Fire protection plate of mineral wool
- 4 Fire protection mastic min. thickness 1 mm

**Example materials used:**

- 3 Hilti CP673 PF
- 4 Hilti CP673

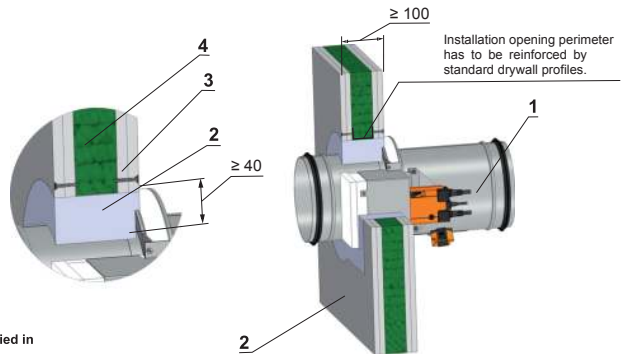
## Installation in a gypsum wall construction

## EIS 120

### EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Mortar or gypsum
- 3 Fire protection plate of mineral wool
- 4 Gypsum wall construction



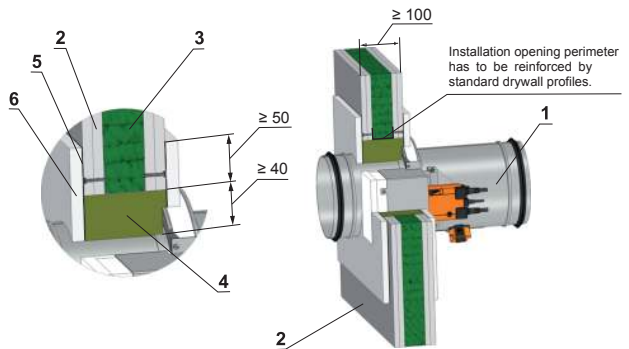
**Notice:** The requirement to EIS 120 must be specified in the order alone. Without specification is supplied the standard flap EIS 90.

## Installation in a gypsum wall construction

## EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Gypsum wall construction
- 3 Fire protection plate of mineral wool
- 4 Stuffing box (mineral stone wool min. density 140 kg/m<sup>3</sup>)
- 5 Fire protection mastic min. thickness 1 mm
- 6 Cement lime plate min. thickness 15 mm



## Installation in a gypsum wall construction (Weichschott system)

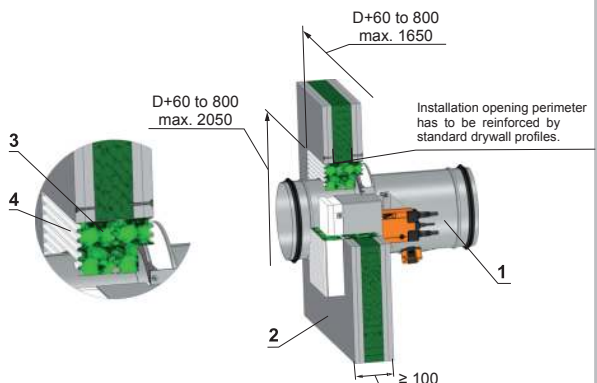
## EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Gypsum wall construction
- 3 Fire protection plate of mineral wool
- 4 Fire protection mastic min. thickness 1 mm

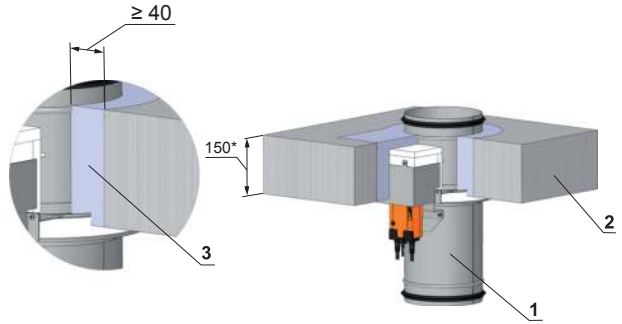
**Example materials used:**

- 3 Hilti CP673 PF
- 4 Hilti CP673



Installation in a solid ceiling construction

**EIS 120**  
**EIS 90**



**Legend:**

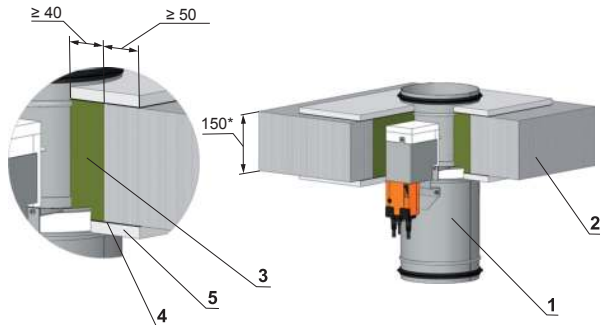
- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Mortar or gypsum

**Notice:** The requirement to EIS 120 must be specified in the order alone. Without specification is supplied the standard flap EIS 90.

\* min. 110 - Concrete/ min. 125 - Aerated Concrete

Installation in a solid ceiling construction

**EIS 90**



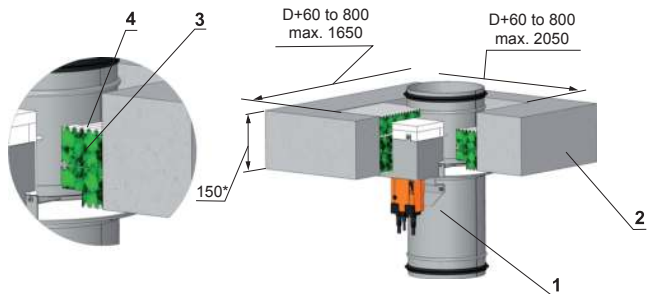
**Legend:**

- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Stuffing box (mineral stone wool min. density 140 kg/m<sup>3</sup>)
- 4 Fire protection mastic min. thickness 1 mm
- 5 Cement lime plate min. thickness 15 mm

\* min. 110 - Concrete/ min. 125 - Aerated Concrete

Installation in a solid ceiling construction (Weichschott system)

**EIS 90**



**Legend:**

- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Fire protection plate of mineral wool
- 4 Fire protection mastic min. thickness 1 mm

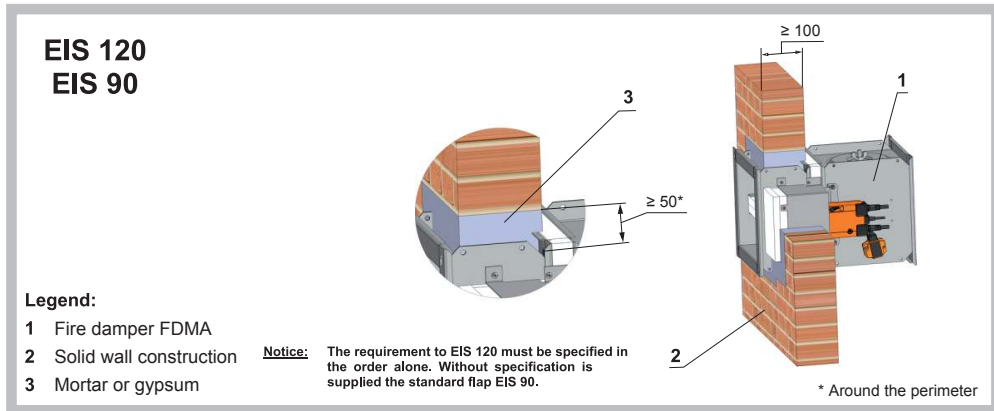
**Example materials used:**

- 3 Hilti CP673 PF
- 4 Hilti CP673

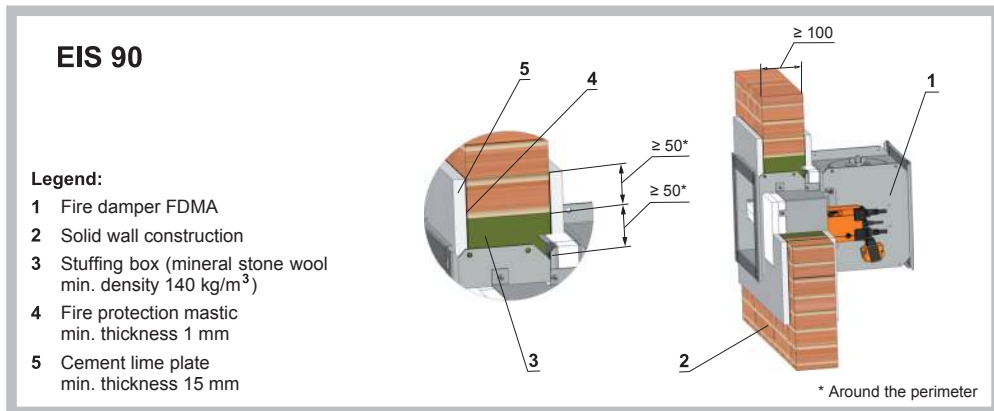
\* min. 110 - Concrete/ min. 125 - Aerated Concrete

## Examples of installation square fire dampers (damper blade inside fire separating construction)

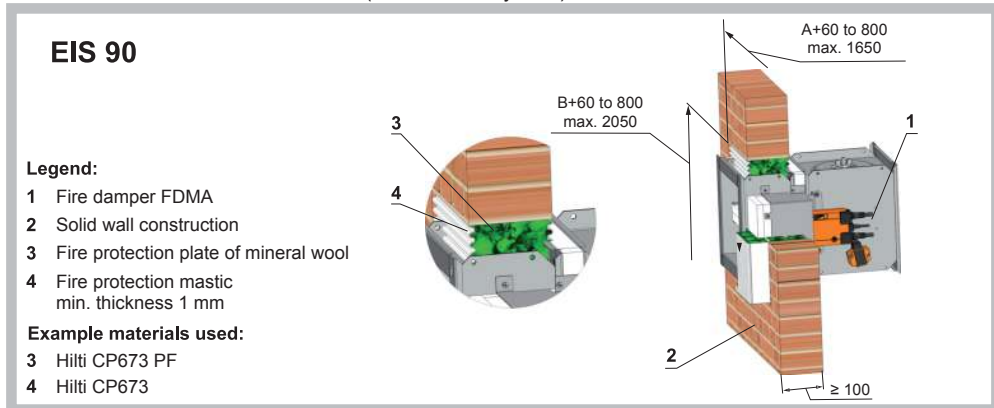
Installation in a solid wall construction



Installation in a solid wall construction



Installation in a solid wall construction (Weichschott system)

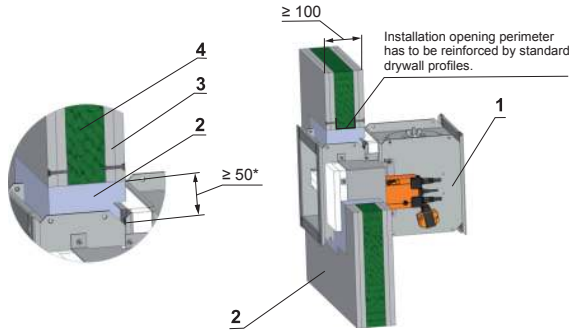


## Installation in a gypsum wall construction

### EIS 120 EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Mortar or gypsum
- 3 Fire protection plate of mineral wool
- 4 Gypsum wall construction



**Notice:** The requirement to EIS 120 must be specified in the order alone. Without specification is supplied the standard flap EIS 90.

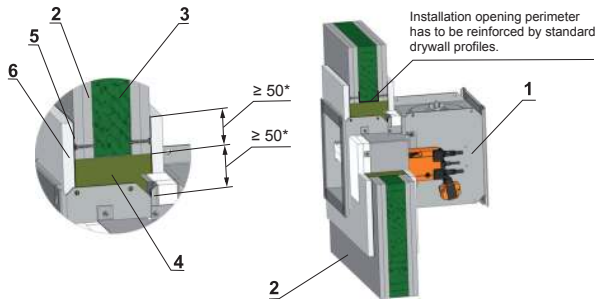
\* Around the perimeter

## Installation in a gypsum wall construction

### EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Gypsum wall construction
- 3 Fire protection plate of mineral wool
- 4 Stuffing box (mineral stone wool min. density 140 kg/m<sup>3</sup>)
- 5 Fire protection mastic min. thickness 1 mm
- 6 Cement lime plate min. thickness 15 mm



\* Around the perimeter

## Installation in a gypsum wall construction (Weichschott system)

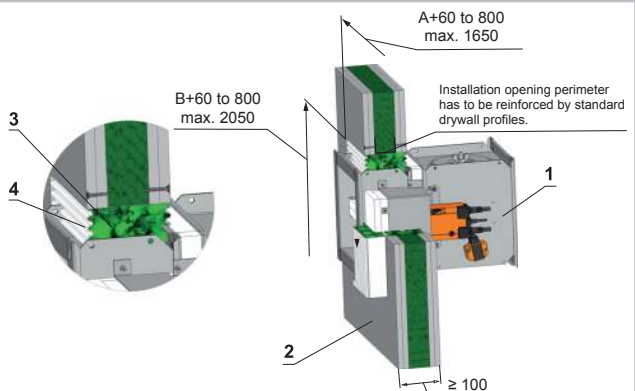
### EIS 90

**Legend:**

- 1 Fire damper FDMA
- 2 Gypsum wall construction
- 3 Fire protection plate of mineral wool
- 4 Fire protection mastic min. thickness 1 mm

**Example materials used:**

- 3 Hilti CP673 PF
- 4 Hilti CP673

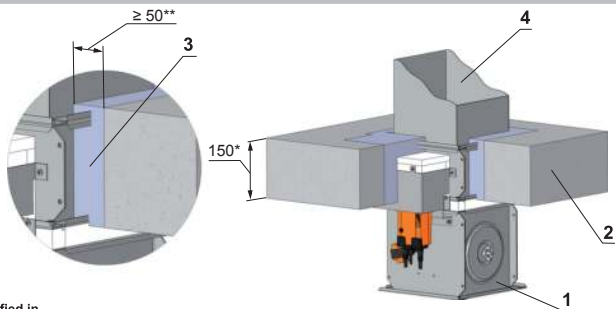


## Installation in a solid ceiling construction

**EIS 120**  
**EIS 90****Legend:**

- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Mortar or gypsum
- 4 Duct

**Notice:** The requirement to EIS 120 must be specified in the order alone. Without specification is supplied the standard flap EIS 90.

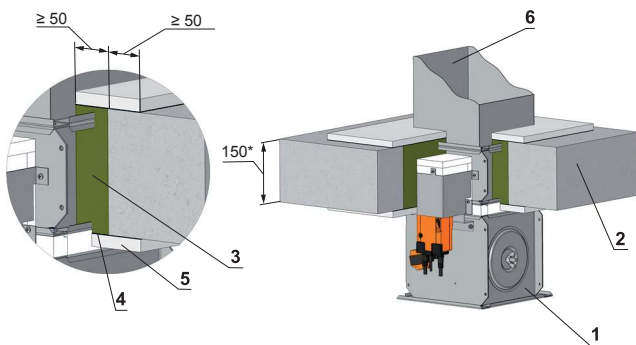


\* min. 110 - Concrete/ min. 125 - Aerated Concrete \*\* Around the perimeter

## Installation in a solid ceiling construction

**EIS 90****Legend:**

- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Stuffing box (mineral stone wool min. density 140 kg/m<sup>3</sup>)
- 4 Fire protection mastic min. thickness 1 mm
- 5 Cement lime plate min. thickness 15 mm
- 6 Duct



\* min. 110 - Concrete/ min. 125 - Aerated Concrete \*\* Around the perimeter

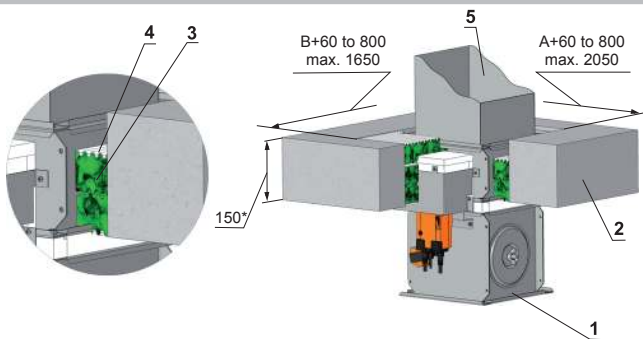
## Installation in a solid ceiling construction (Weichschott system)

**EIS 90****Legend:**

- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Fire protection plate of mineral wool
- 4 Fire protection mastic min. thickness 1 mm
- 5 Duct

**Example materials used:**

- 3 Hilti CP673 PF
- 4 Hilti CP673



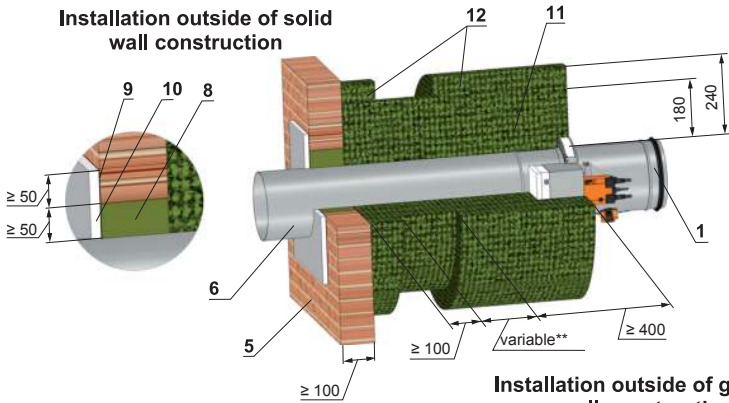
\* min. 110 - Concrete/ min. 125 - Aerated Concrete

**Another methods of installation of fire dampers are available in TPM 018/01.**

**Examples of installation Round fire dampers  
(damper blade outside fire separating construction)**

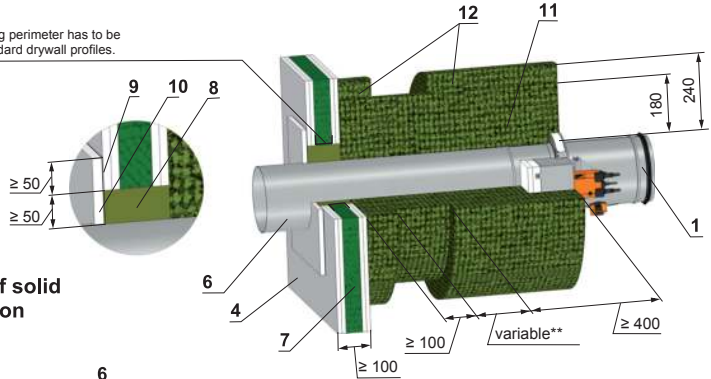
**EIS 90**

**Installation outside of solid wall construction**

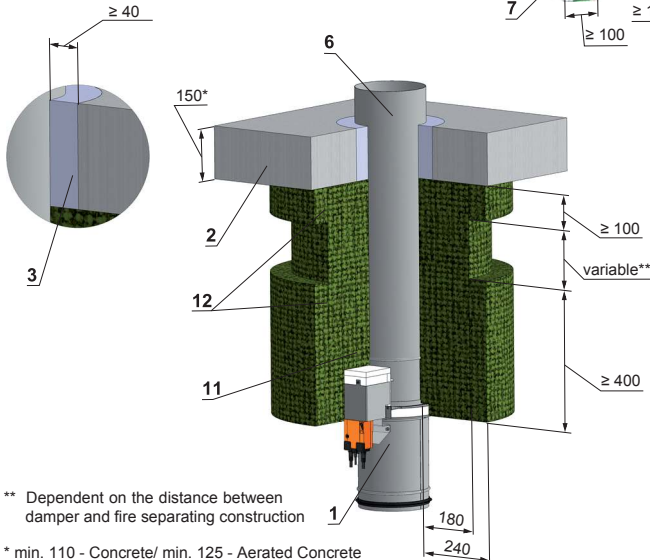


**Installation outside of gypsum wall construction**

Installation opening perimeter has to be reinforced by standard drywall profiles.



**Installation outside of solid ceiling construction**



**Legend:**

- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Mortar or gypsum
- 4 Gypsum wall construction
- 5 Solid wall construction
- 6 Duct
- 7 Fire protection plate of mineral wool
- 8 Mineral stone wool
- 9 Fire protection mastic min. thickness 1 mm
- 10 Cement lime plate min. thickness 15 mm
- 11 Stone wool with one side stitched on wire grids, bulk density 105 kg/m<sup>3</sup> thick. 180 mm (e.g., three layers thick. 60 mm)
- 12 Stone wool with one side stitched on wire grids, bulk density 105 kg/m<sup>3</sup> thick. 60 mm

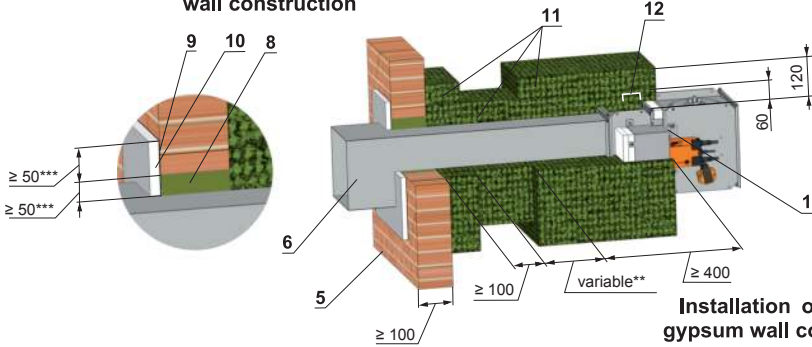
\*\* Dependent on the distance between damper and fire separating construction

\* min. 110 - Concrete/ min. 125 - Aerated Concrete



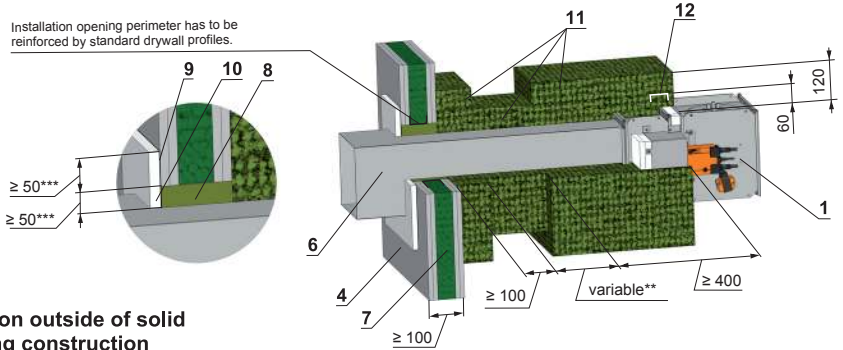
**Examples of installation Square fire dampers  
(damper blade outside fire separating construction)**

**EIS 90 Installation outside of solid wall construction**

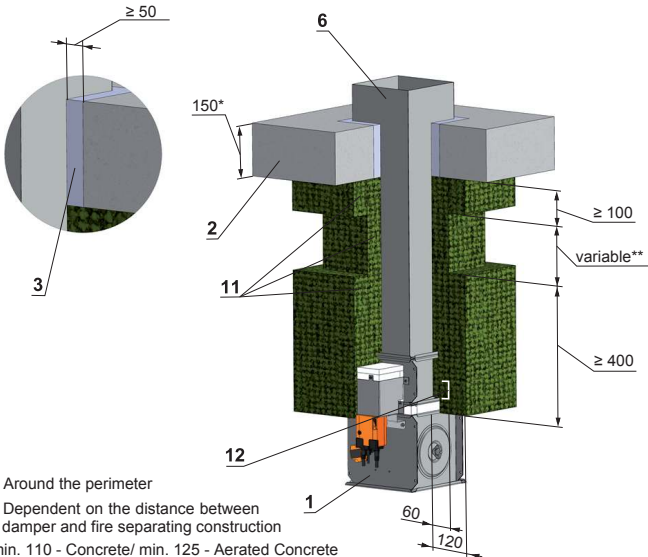


**Installation outside of gypsum wall construction**

Installation opening perimeter has to be reinforced by standard drywall profiles.



**Installation outside of solid ceiling construction**



**Legend:**

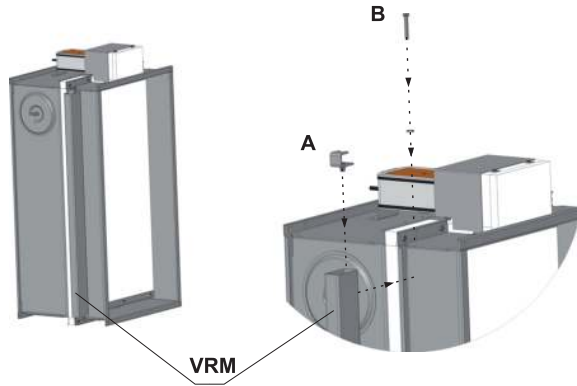
- 1 Fire damper FDMA
- 2 Solid ceiling construction
- 3 Mortar or gypsum
- 4 Gypsum wall construction
- 5 Solid wall construction
- 6 Duct
- 7 Fire protection plate of mineral wool
- 8 Mineral stone wool
- 9 Fire protection mastic min. thickness 1 mm
- 10 Cement lime plate min. thickness 15 mm
- 11 Stone wool resin bonded containing toxic rubble as refrigerants, fire resistance EIS 90 min. density 300 kg/m<sup>3</sup> th. 60 mm and 120 mm
- 12 Sheet metal a stiffener U25x40x25

\*\*\* Around the perimeter

\*\* Dependent on the distance between damper and fire separating construction

\* min. 110 - Concrete/ min. 125 - Aerated Concrete

**Reinforcement VRM fixing**

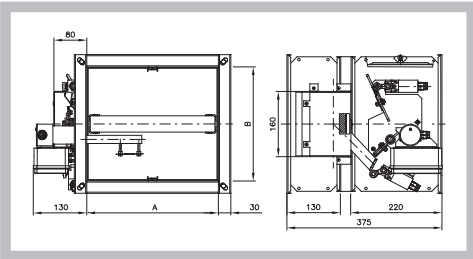


- 1.) Insert part A into reinforcement VRM
- 2.) Set up nut of the part A under correct hole
- 3.) Lock screw B
- 4.) It has to be done on each side of VRM-90

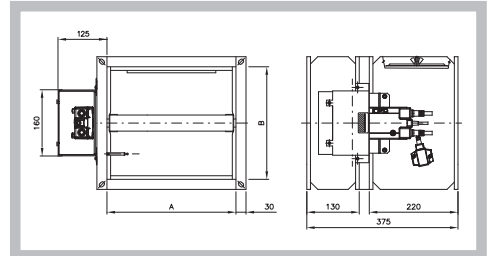
NOTICE: For dampers with  $A \geq 800$  and damper placement outside wall construction is necessary to use reinforcement VRM.

**Damper dimensions**

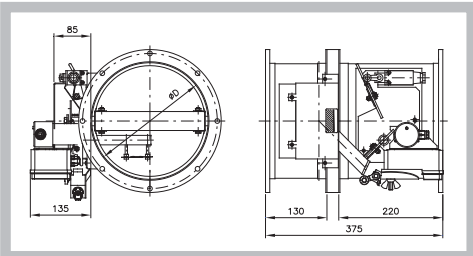
**Square damper - design manual and thermal**



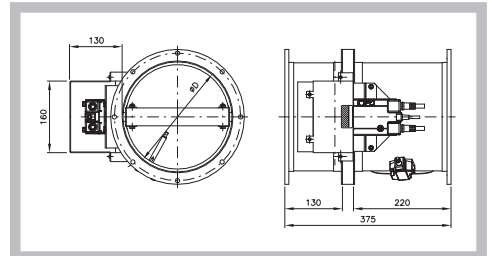
**Square damper with actuating mechanism**



**Round damper with actuating mechanism**



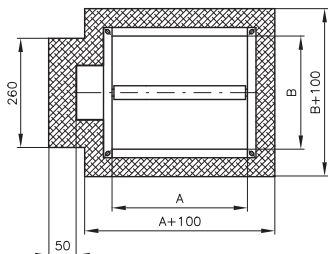
**Round damper with flange - an actuator**



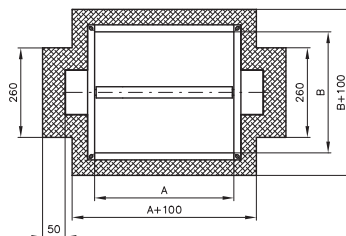
## Installation instructions

1. All fire dampers has to be closed during installation process.
2. The control mechanism has to be protected (covered) against damage and pollution during installation process.
3. Min. gap for installation (installation opening) is 50 mm (circular dimension  $\varnothing D + 160$  mm or square dimension  $A \times B + 100$  mm).
4. Installation gap must be filled by approved material perfectly in all the installation space volume (installation gap).
5. The distance between the fire damper and the construction (wall, ceiling) must be minimum 75 mm according to EN 1366-2. In case that two or more dampers are supposed to be installed in one fire separating construction, the distance between the adjacent dampers must be at least 200 mm according to EN 1366-2 paragraph 13.5.
6. Installation openings

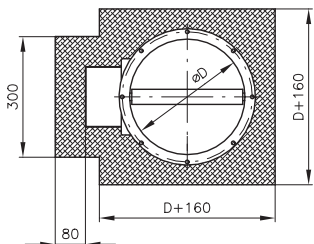
Installation opening - square damper with actuating mechanism or manual and thermal



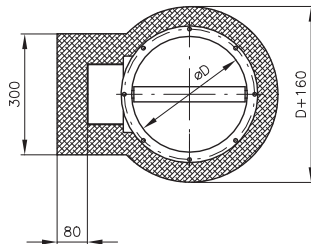
Installation opening - square damper with two springs



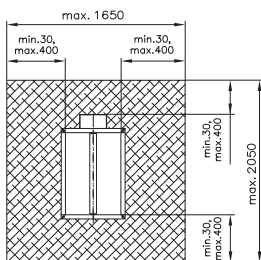
Installation opening - round damper with actuating mechanism or manual and thermal



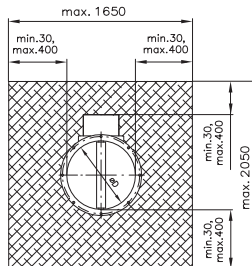
Installation opening - round damper with actuating mechanism or manual and thermal



Installation opening - square damper with actuating mechanism or manual and thermal



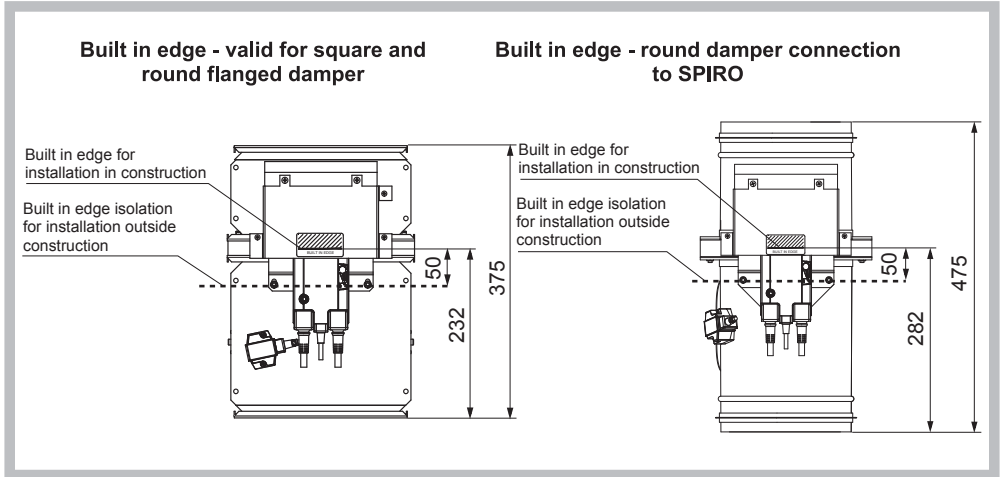
Installation opening - round damper with actuating mechanism or manual and thermal



### Notice

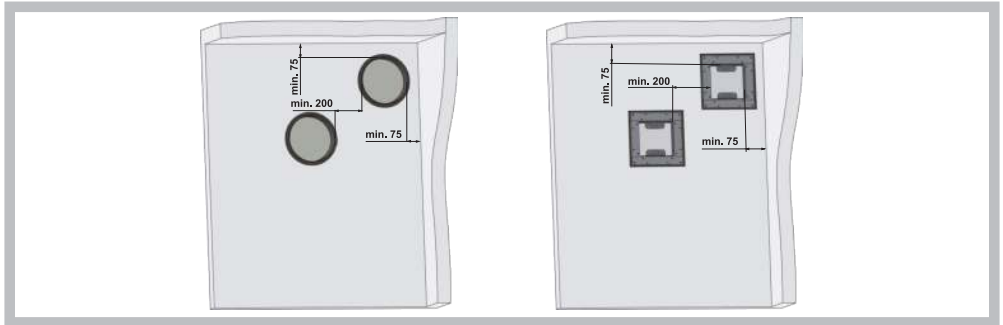
Fire dampers are suitable for installation in arbitrary position in vertical and horizontal passages of fire separating constructions. Damper assembly procedures must be done so as all load transfer from the fire separating constructions to the damper body is absolutely excluded. Back-to-back air-conditioning piping must be hung or supported so as all load transfer from the back-to-back piping to the damper is absolutely excluded.

7. The fire damper can be installed into a solid or gypsum wall construction or into solid ceiling construction. Damper blade has to be inside of construction (labelled with BUILD IN EDGE on the damper body). The fire damper can also be integrated outside the wall construction. Duct and the damper part between the wall construction and the damper blade (labelled with BUILD IN EDGE on the protective covering) must be protected with fire-fighting insulation.



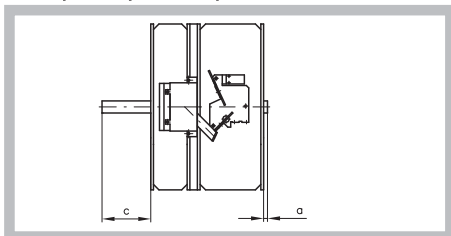
8. All fire dampers has to be closed during installation process. The damper body should not be deformed in the course of bricking in. Once the damper is built in, its blade should not grind on the damper body during opening or closing.
9. To provide needed access space to the control device, all other objects must be situated at least 350 mm from the control parts of the damper. Inspection hole must be accessible.

**Placement of the openings in the wall**

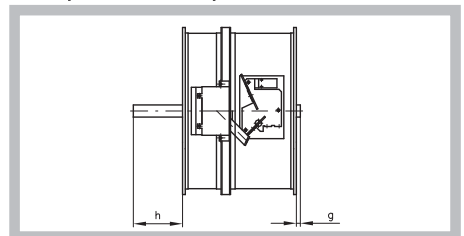


10. Damper blade overlaps

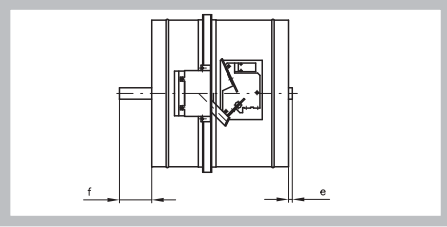
**Overlaps of square dampers**



**Overlaps of round dampers**



**Overlaps of SPIRO dampers**



DN	g	h	e	f
180	-	-	-	-
200	-	-	-	-
225	-	-	-	-
250	-	5	-	-
280	-	20	-	-
315	-	37	-	-
355	-	57	-	7
400	-	80	-	30
450	-	105	-	55
500	-	130	-	80
560	15	160	-	110
630	50	195	-	145
710	90	235	40	185
800	135	280	85	230
900	185	330	135	280
1000	235	380	185	330

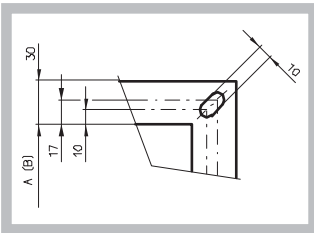
AxB	a	c
Ax180(200)	-	-
Ax250	-	5
Ax300	-	30
Ax315	-	37
Ax355	-	57
Ax400	-	80
Ax450	-	105
Ax500	-	130
Ax550	10	155
Ax560	15	160
Ax630	50	195
Ax650	60	205
Ax710	90	235
Ax750	110	255
Ax800	135	280
Ax900	185	330
Ax1000	235	380

**Notice:**

For square and round fire dampers the open damper blade overlaps the damper body by the value "a" and "c" or "g" and "h" for round fire damper for SPIRO ducts the open damper blade overlaps the damper body by the value "f" or "e". Values "a" and "c", "g" and "h" or "f" and "e" have to be respected when projecting related air-conditioning ducts.

**11. Flanges and Bracket**

**Flage of square damper**



Flanges square damper 30 mm wide in the corners are provided with oval holes. connecting dimensions of flanges round damper according to EN 12 220.

**12. Electrical components, wiring diagrams**

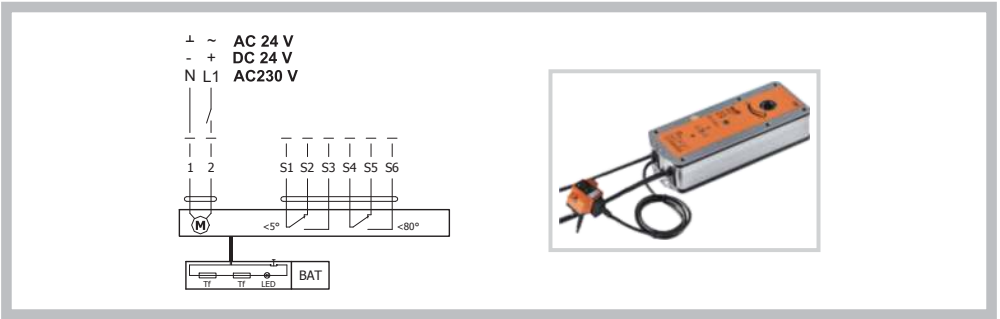
**Actuating mechanism BELIMO BFL, BFN 230-T**

**AC230 V**

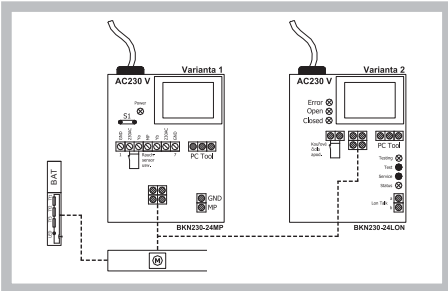
**Actuating mechanism BELIMO BFL, BFN 24-T(-ST)**

**AC/DC 24**

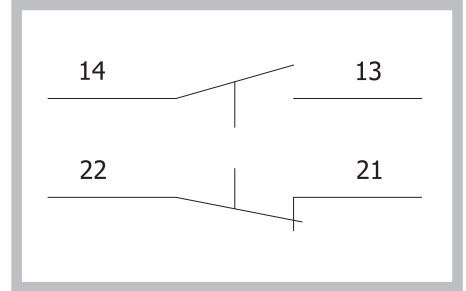
## Servophon BELIMO BF 24-TN(-ST), BF 230-TN



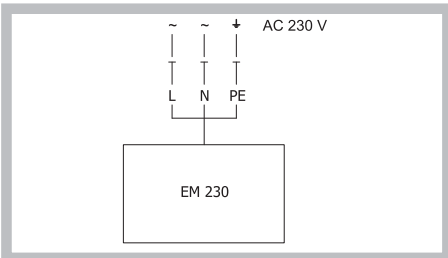
## Actuating mechanism BELIMO BF 24TL-TN-ST



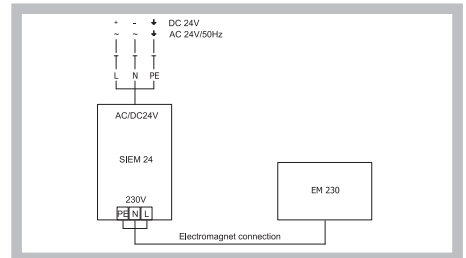
## Terminal switch XCKN2118G-11



## Electromagnet EM230



## Electromagnet EM230 with pulse switch SIEM24



13. Before entering the dampers into operation after assembly and after sequential revisions, checks and functionality tests of all designs including operation of the electrical components must be done. After entering into operation, these revisions must be done according to requirement set by national regulations.

14. Before entering the dampers into operation after their assembly and by sequential checks, the following checks must be carried out for all designs.

Visual inspection of proper damper integration, inside damper area, damper blade, contact surfaces and silicon sealing.

Inspection hole disassembly: release the covering lid by turning the wing nut and while turning the lid right or left release it from the security belt. Then tilt the lid and remove it from its original position.

15. Before entering the dampers with manual control into operation after their assembly and by sequential checks, checks according 14. and following checks must be carried out.

Check of thermal protective fuse and closing mechanism.

Exert pressure on double arm initiation lever with a spring to release the control lever and check its displacement into the "CLOSED" position. Closing must be smart and the control lever must be firmly locked with a pawl. In case that the closing is not smart enough and the control lever is not locked with the pawl in the "CLOSED" position, higher pre-stretch of the closing spring must be set using a ratchet wheel.

Proper function of the thermal fuse can be checked when the fuse is removed from the starting mechanism. The initiation lever must be turned over and control lever is moved to position "CLOSED". If this is not possible, then the starting mechanism spring must be checked or the base plate must be replaced. The base plate is attached to the damper body with M5 screws.

Displacing the damper blade into "OPEN" position is done the following way:

Release the pawl exerting pressure and return the control lever into the second outlaying position where the lever is hold by the initiation lever.

In case of the flap valve with an electromagnet check the control lever displacement into the "CLOSED" position after connecting to power supply.

16. Before entering the dampers with actuating mechanism into operation after their assembly and by sequential checks, checks according 14. and following checks must be carried out.

Check of blade displacement into the breakdown position "CLOSED" can be done after cutting off the actuating mechanism supply (e.g. by pressing the RESET button at the thermoelectrical starting mechanism BAT or cutting off the supply from ELECTRICAL FIRE SIGNALISATION). Check of blade displacement back into the "OPEN" position can be done after restoration of power supply (e.g. By releasing the RESET button or restoration of supply from ELECTRICAL FIRE SIGNALISATION).

17. Manual operation

Without power supply, the damper can be operated manually and fixed in any required position. Release of the locking mechanism can be achieved manually or automatically by applying the supply voltage.

18. It is recommended to provide periodical checks, maintenance and service actions on Fire Equipment by Authorized persons schooled by Producer.

19. All effective safety standards and directives must be observed during fire damper assembly.

## Material

1. Damper bodies are supplied in the standard design made of galvanized plate without any other surface finish.
2. Damper blades are made of fire resistant asbestos free boards made of mineral fibres.
3. Damper controls are made of galvanized materials with no other surface finish.
4. Springs are galvanized.
5. Thermal protective fuses are made of sheet brass, thickness = 0.5 mm.
6. Fasteners is galvanized.

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