

EN 15650:2010-09

MANDÍK[®]

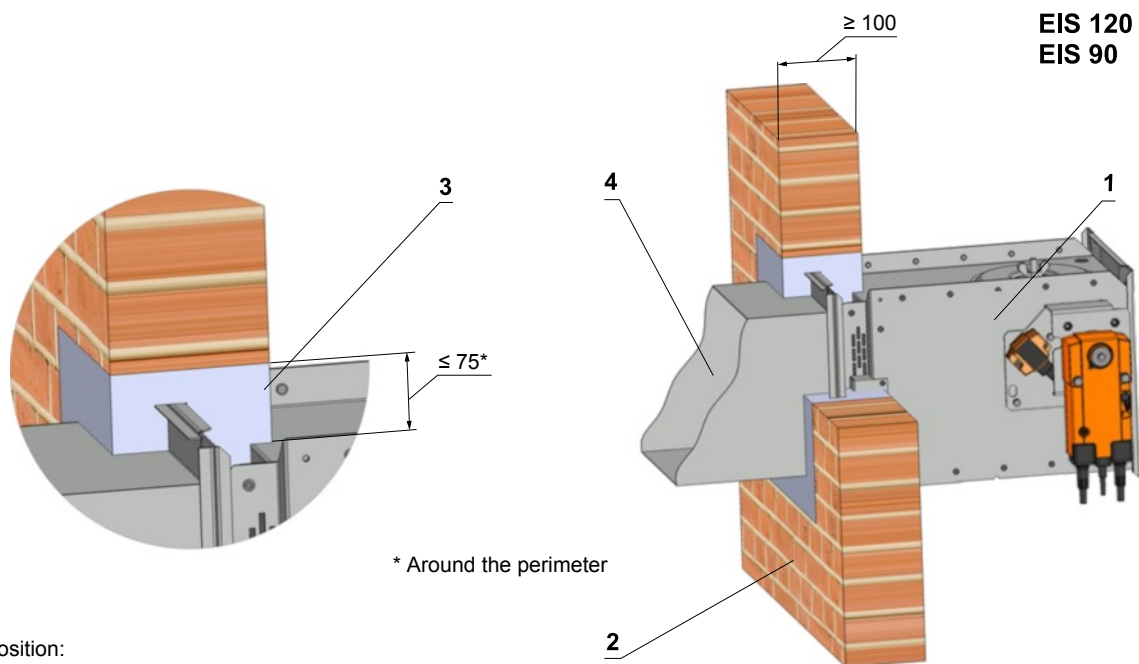
INSTALLATION INSTRUCTIONS

FIRE DAMPER FDMB



Installation in solid wall construction

Solid wall construction - mortar or gypsum

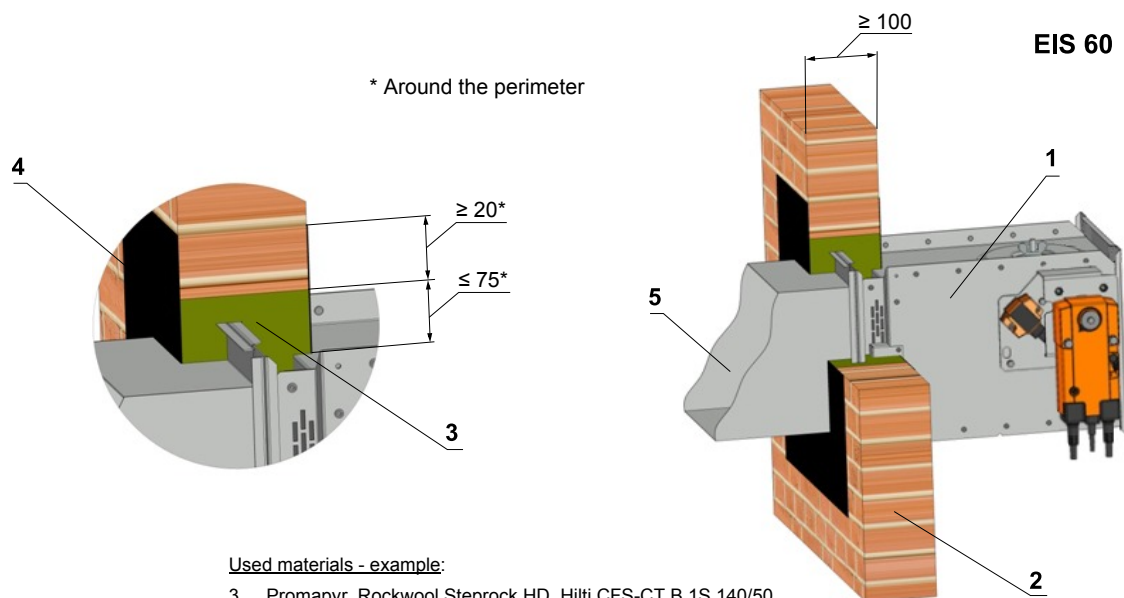


Position:

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

* Around the perimeter

Solid wall construction - stuffing box and fire protection mastic



* Around the perimeter

Used materials - example:

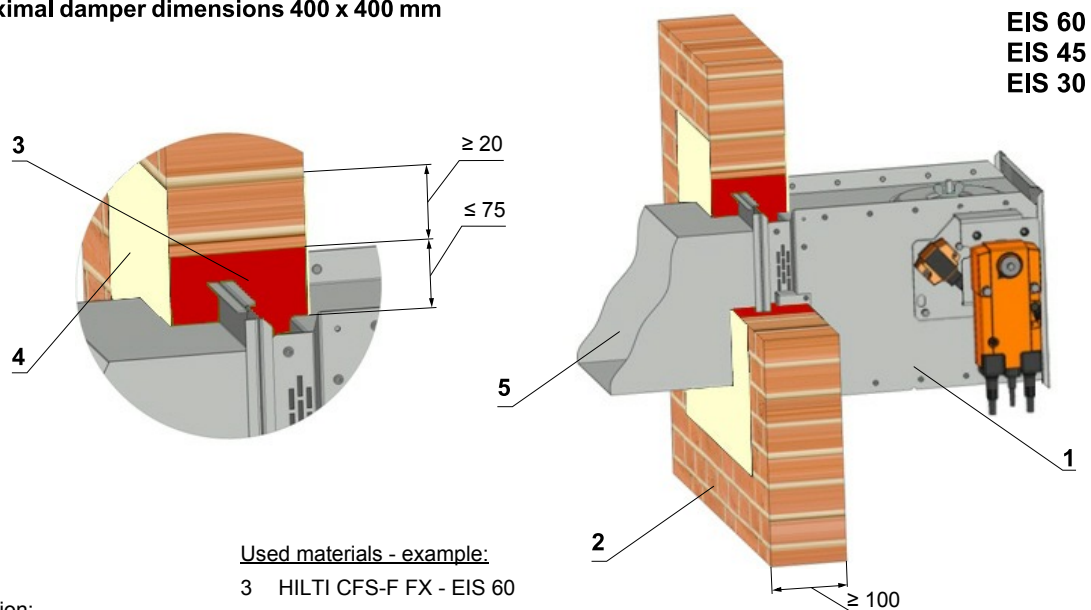
- 3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
- 4 Promastop - P, K, Hilti CFS-CT

Position:

- 1 Fire damper
- 2 Solid wall construction
- 3 Stuffing box (mineral stone wool min. density 140 kg/m³)
- 4 Fire protection mastic min. thickness 1 mm
- 5 Duct

Solid wall construction - fire protection foam with stucco plaster

Maximal damper dimensions 400 x 400 mm



Used materials - example:

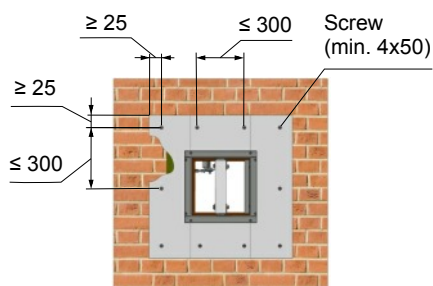
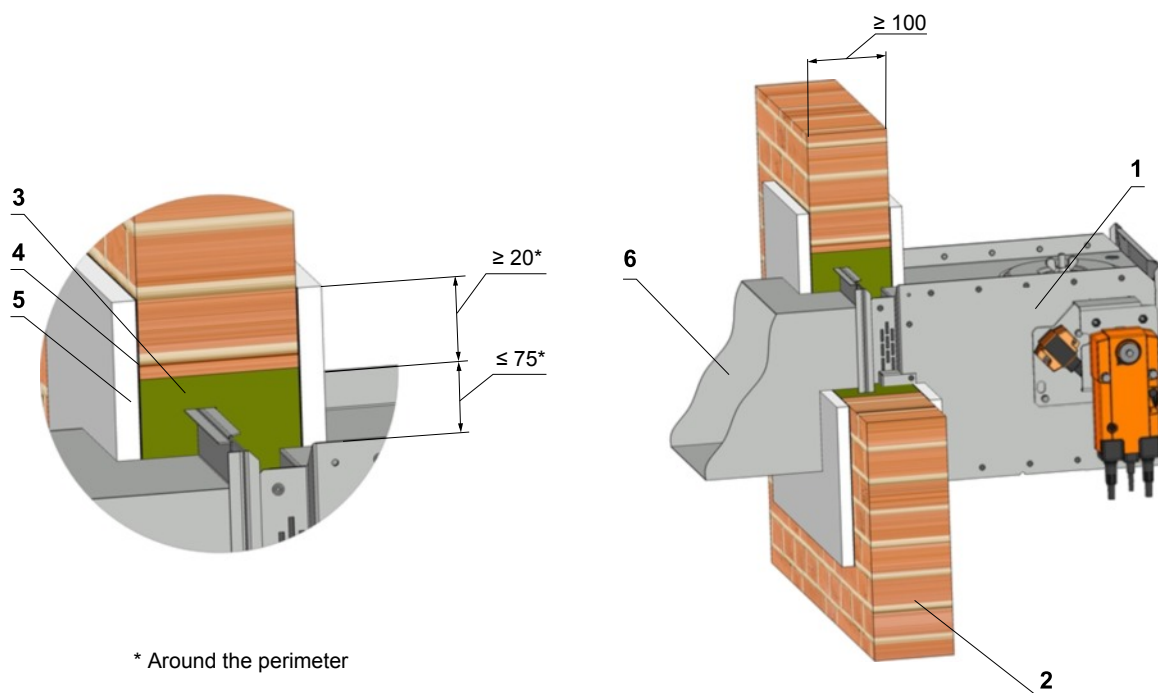
- 3 HILTI CFS-F FX - EIS 60
PROMAFOAM-C - EIS 45
Soudal, Soudafoam FR-B1 - EIS 30
DenBraven, Fire protection foam - EIS 30

Position:

- 1 Fire damper
- 2 Solid wall construction
- 3 Fire protection foam
- 4 Stucco plaster
- 5 Duct

Solid wall construction - stuffing box, fire protection mastic and cement lime plate

EIS 90



Screws has to be fixed in wall/ceiling construction.
(If it is needed use steel bracket).

Used materials - example:

- 3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
- 4 Promastop - P, K, Hilti CFS-CT
- 5 Promatect - H

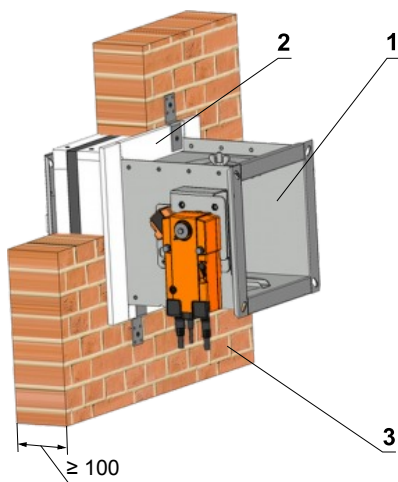
Position:

- 1 Fire damper
- 2 Solid wall construction
- 3 Stuffing box (mineral stone wool min. density 140 kg/m³)
- 4 Fire protection mastic min. thickness 1 mm
- 5 Cement lime plate min. thickness 15 mm min. density 870 kg/m³
- 6 Duct

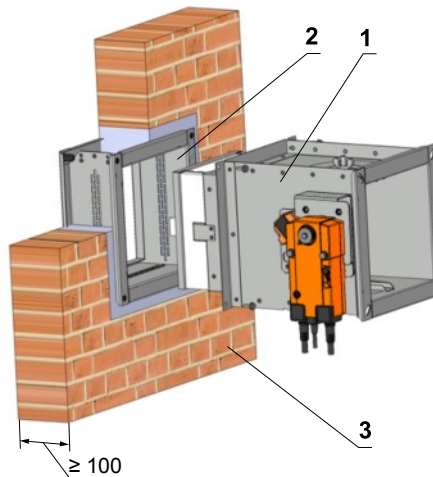
Solid wall construction - installation frame E1, E2, E4

EIS 90

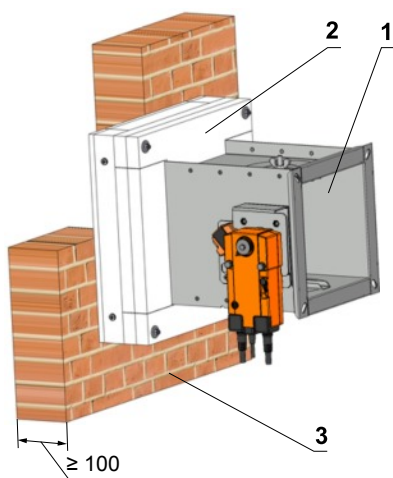
Installation frame E1



Installation frame E2



Installation frame E4

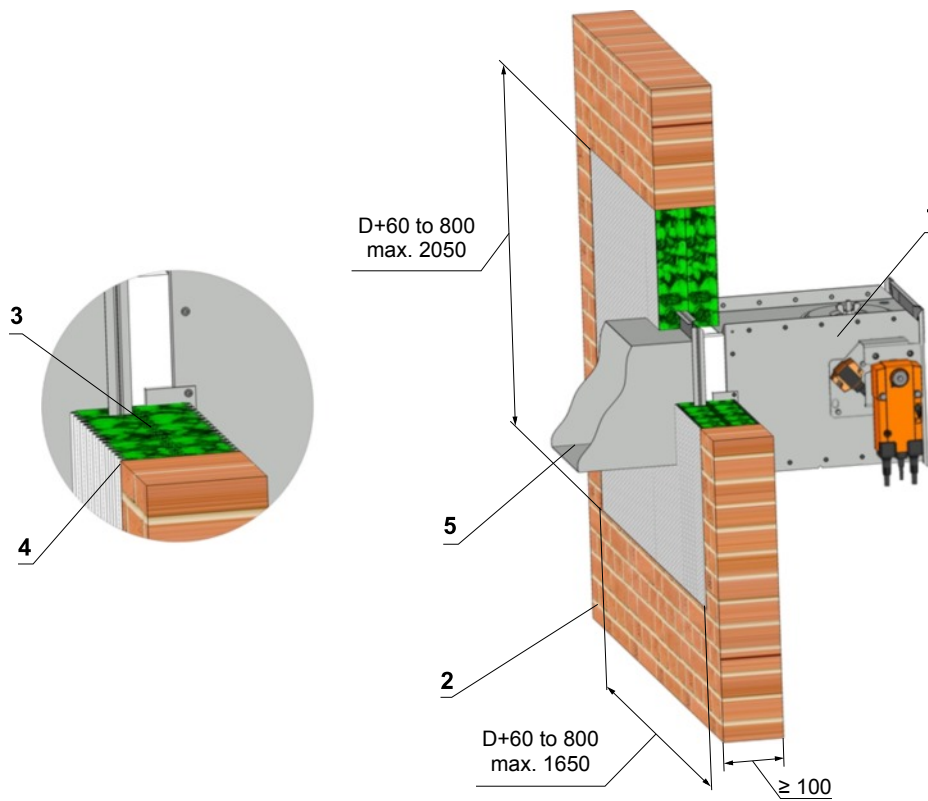


Position:

- 1 Fire damper
- 2 Installation frame
- 3 Solid wall construction

Solid wall construction - Weichschott

EIS 90



Position:

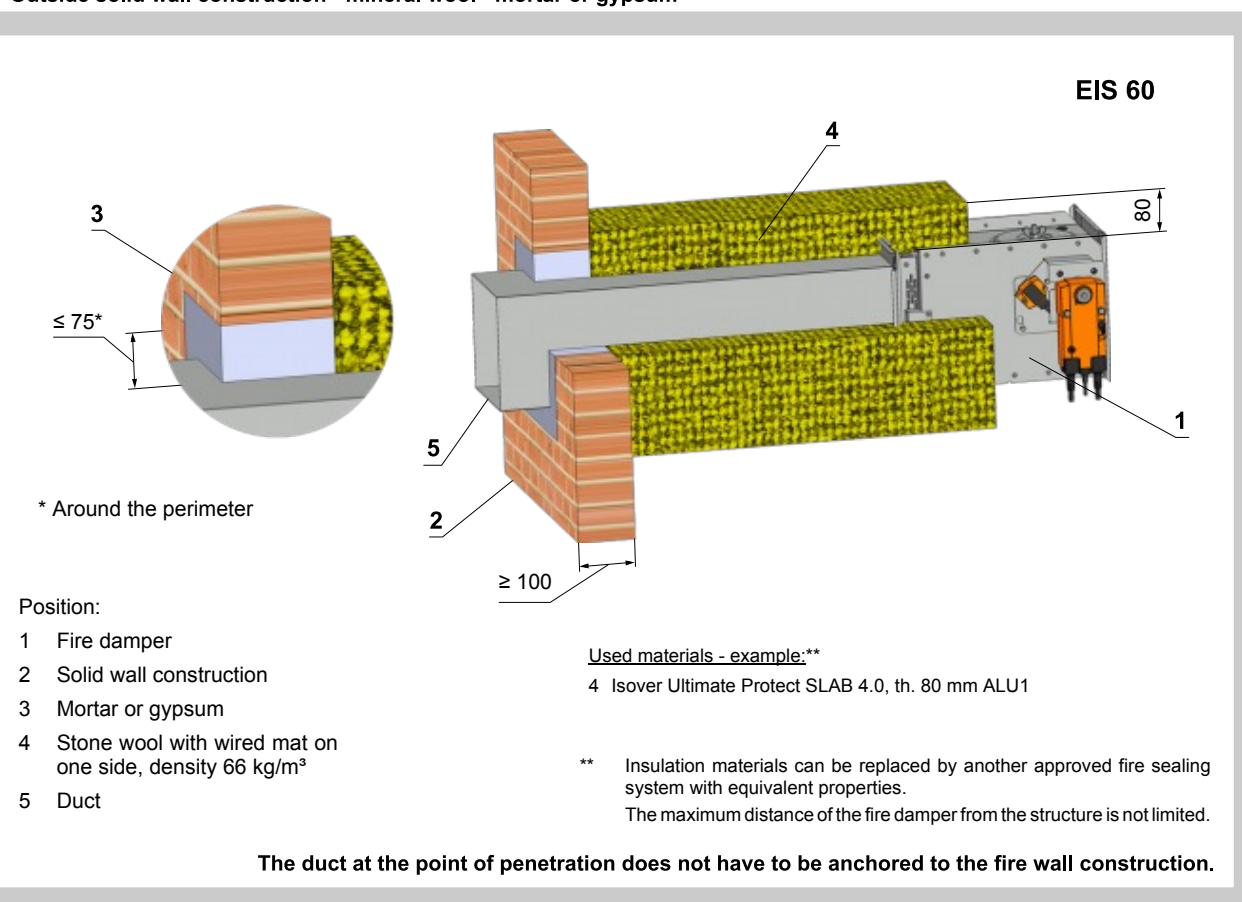
- 1 Fire damper
- 2 Solid wall construction
- 3 Fire resistant board
- 4 Fire stop coating thickness 1 mm
- 5 Duct

Used materials - example:

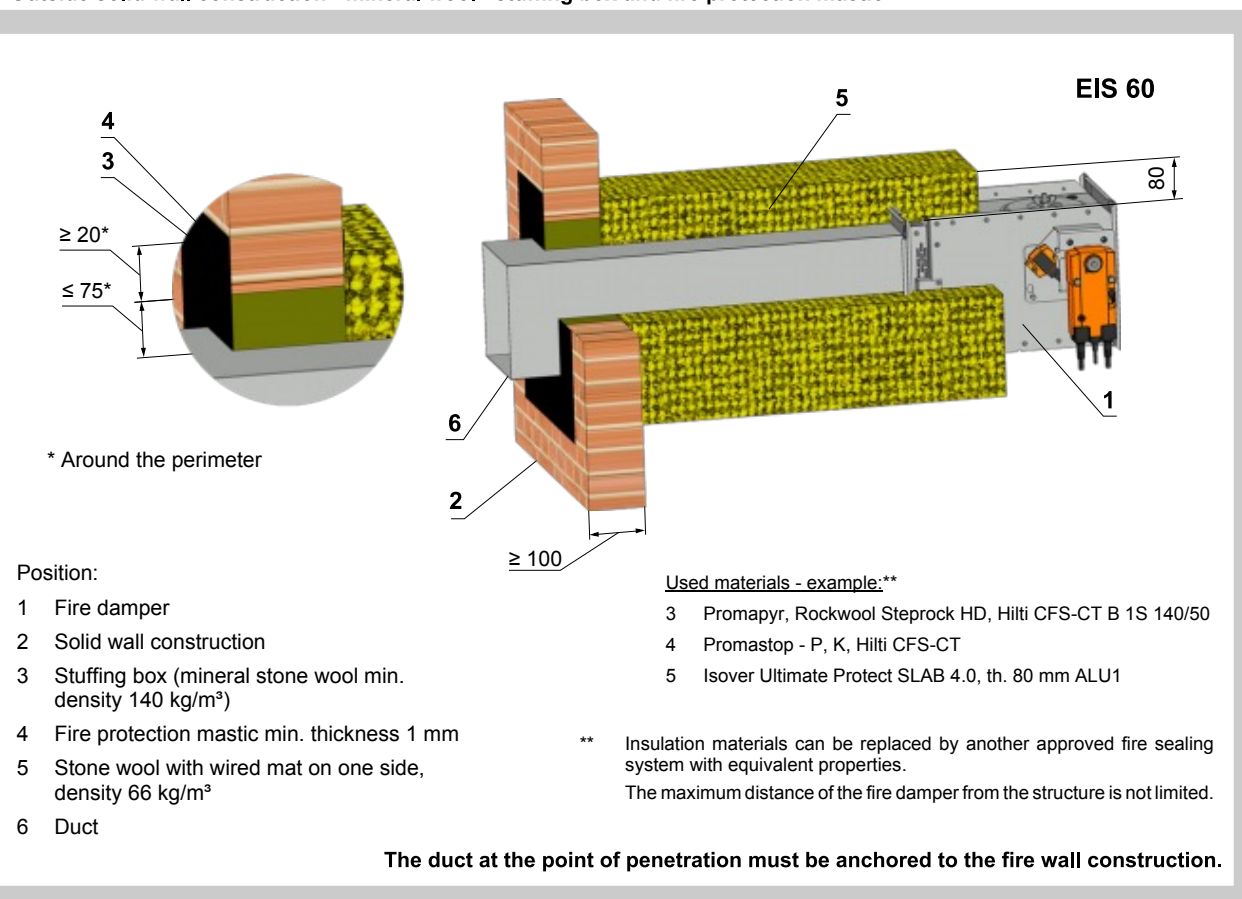
- 3 Hilti CFS-CT B 1S 140/50
- 4 Hilti CFS-CT

Installation outside solid wall construction

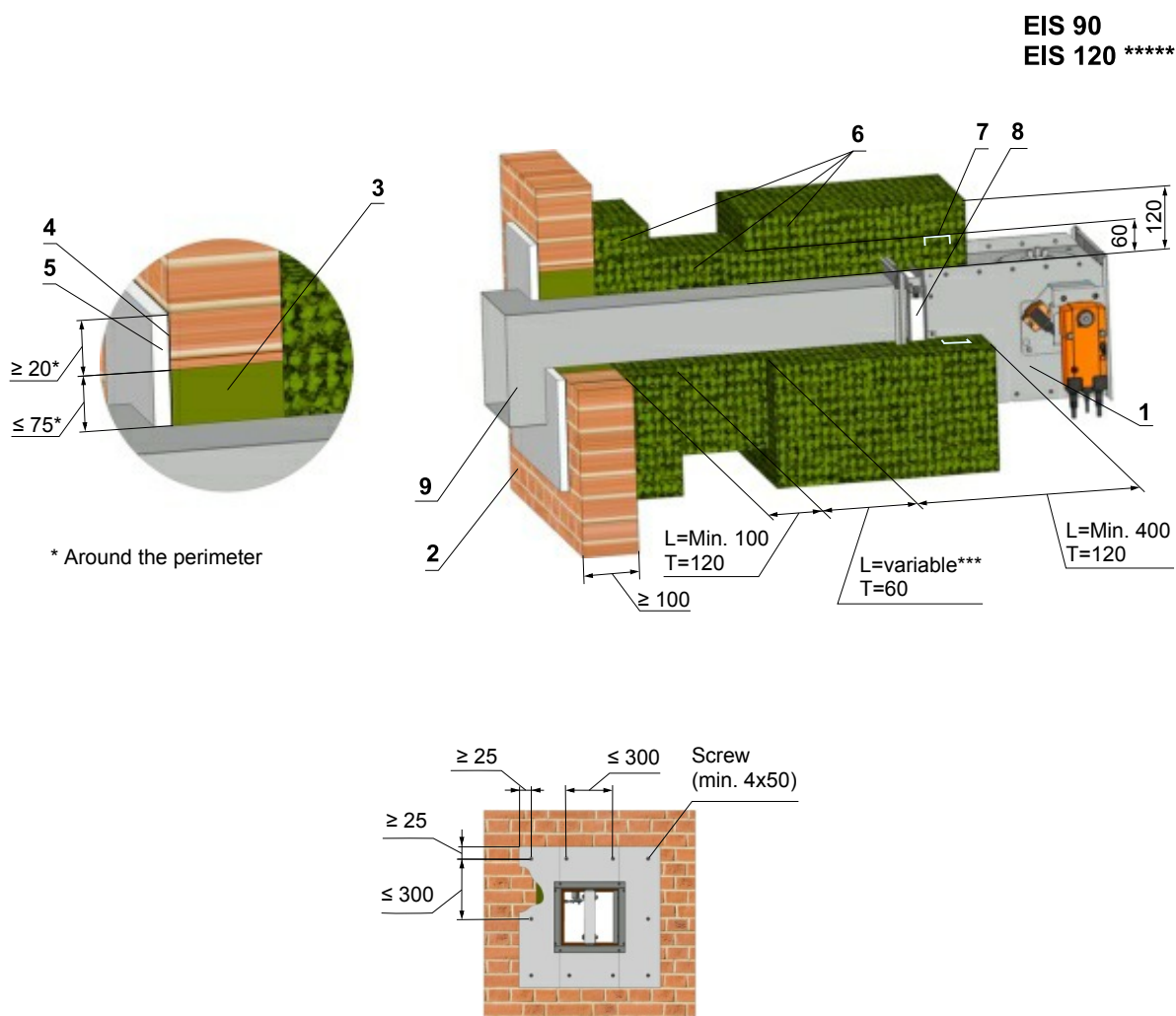
Outside solid wall construction - mineral wool - mortar or gypsum



Outside solid wall construction - mineral wool - stuffing box and fire protection mastic



Outside solid wall construction - mineral wool, stuffing box, fire protection mastic and cement lime plate



Screws has to be fixed in wall/ceiling construction.
(If it is needed use steel bracket).

Used materials - example:**

- 3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
- 4 Promastop - P, K, Hilti CFS-CT
- 5 Promatect - H
- 6 Rockwool Conlit Ductrock EIS 90, th. 60 mm

Position:

- 1 Fire damper
- 2 Solid wall construction
- 3 Mineral stone wool min. density 140 kg/m³
- 4 Fire protection mastic min. thickness 1 mm
- 5 Cement lime plate min. thickness 15 mm (min. density 870 kg/m³)
- 6 Stone wool bound with use of an organic resin with crushed stone as a refrigerant, min. density 300 kg/m³ and min. thickness 60 mm
- 7 Profil U25x40x25
- 8 VRM****
- 9 Duct

** Stuffing box, fire protection mastic, cement lime plate and insulation materials can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

*** Depends on the distance of the flap from the construction, when the maximum distance from the construct is not limited and according to EN 15882-2 must use the required number of hinges according to EN 1366-1:2014.

**** Reinforcement fixing VRM
Installation of profile U25x40x25

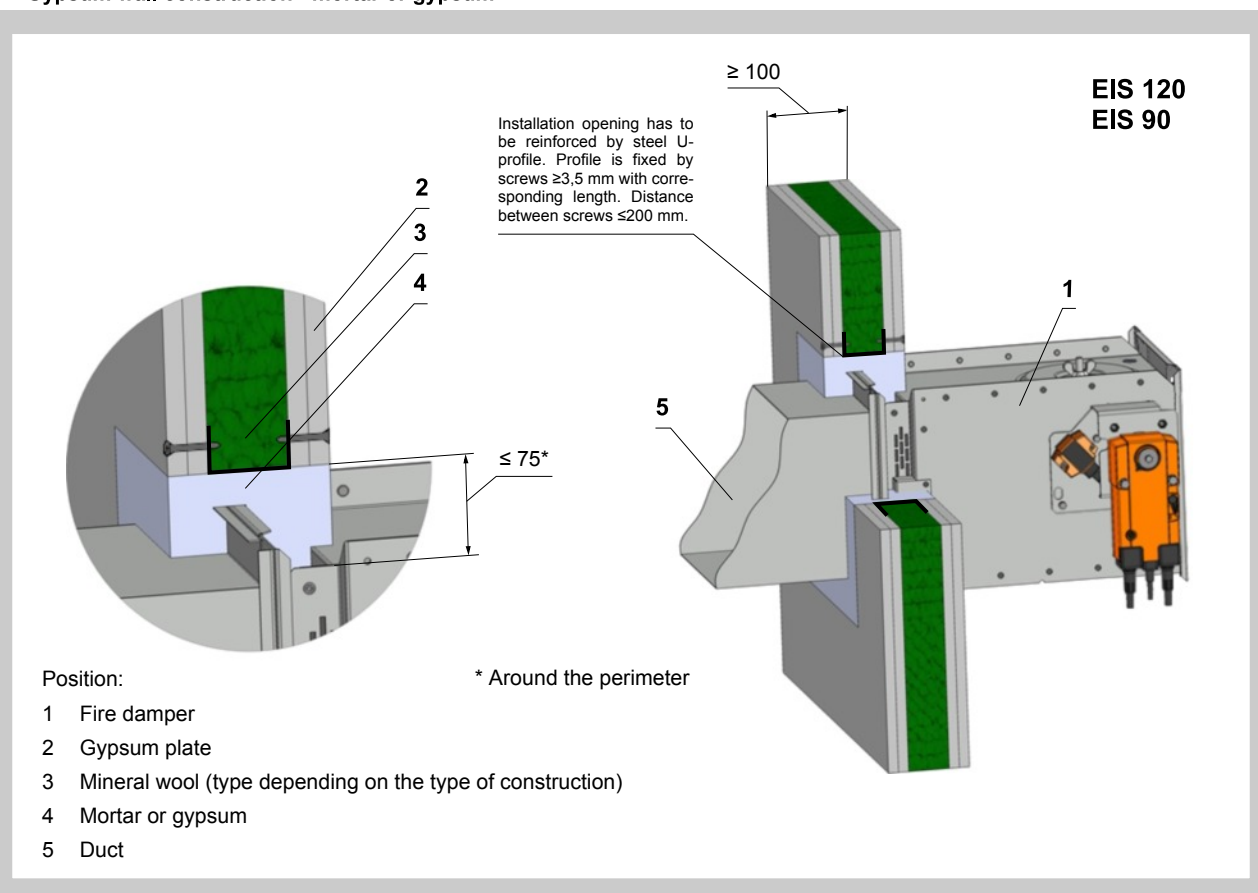
***** When using Rockwool Conlit Ductrock EIS 120, th. 60 mm, the overall fire resistance of the EIS 120 can be achieved.

T - thickness of the insulation (mm)

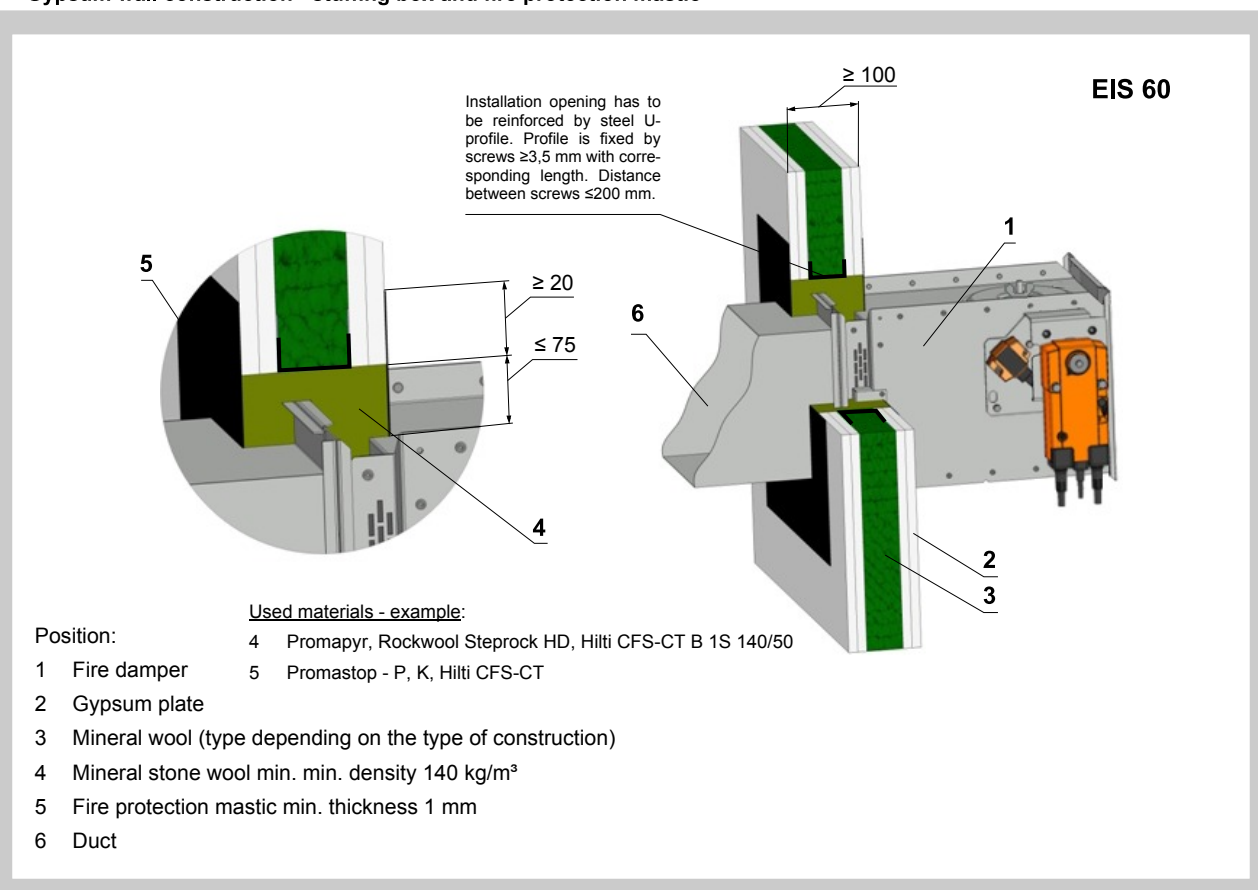
The duct at the point of penetration must be anchored to the fire wall construction.

Installation in gypsum wall construction

Gypsum wall construction - mortar or gypsum

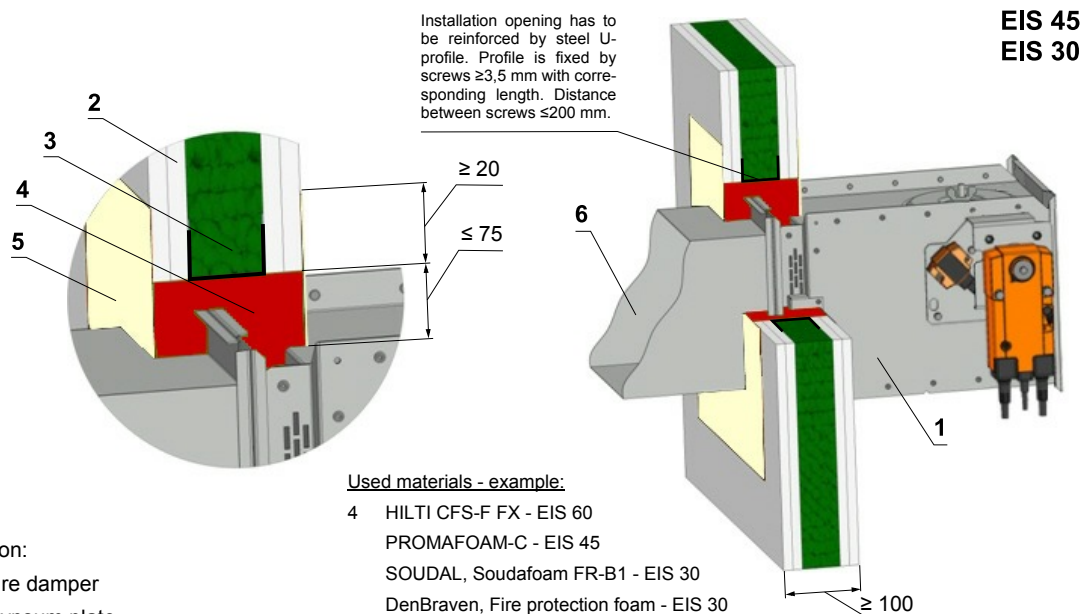


Gypsum wall construction - stuffing box and fire protection mastic



Gypsum wall construction - fire protection foam with stucco plaster

Maximal damper dimensions 400 x 400 mm

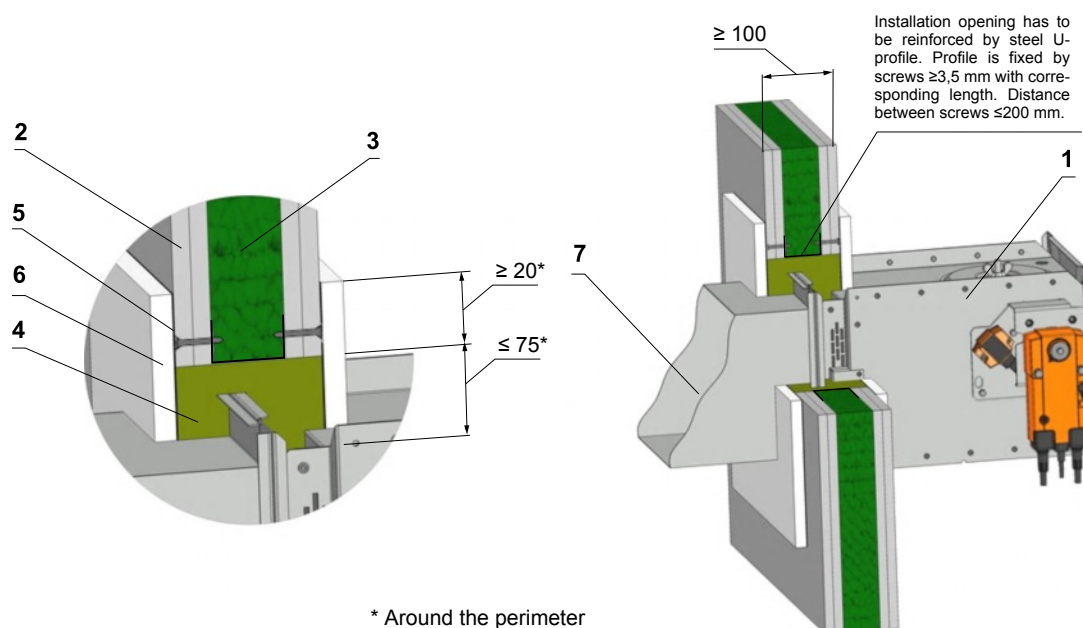


Position:

- 1 Fire damper
- 2 Gypsum plate
- 3 Mineral wool (type depending on the type of construction)
- 4 Fire protection foam
- 5 Stucco plaster
- 6 Duct

Gypsum wall construction - stuffing box, fire protection mastic and cement lime plate

EIS 90



Screws has to be fixed in wall/ceiling construction.
(If it is needed use steel bracket).

Used materials - example:

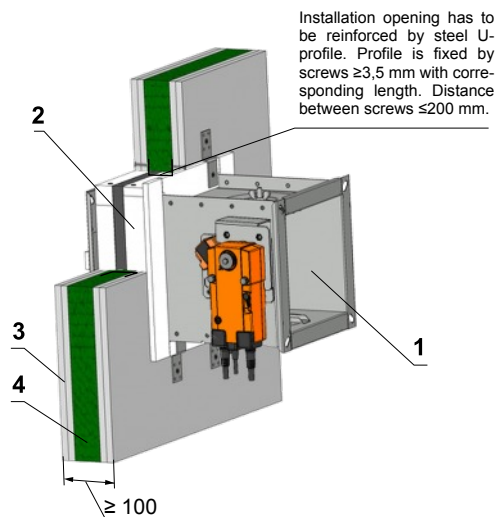
Position:

- 1 Fire damper
- 2 Gypsum plate
- 3 Mineral wool (type depending on the type of construction)
- 4 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
- 5 Promastop - P, K, Hilti CFS-CT
- 6 Promatect - H
- 7 Duct

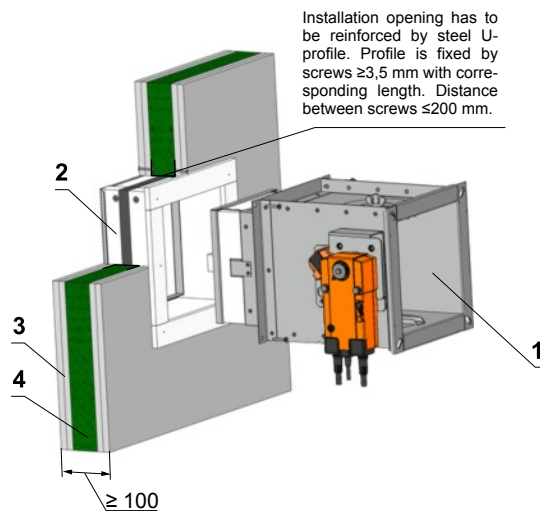
Gypsum wall construction - installation frame E1, E3, E4

EIS 90

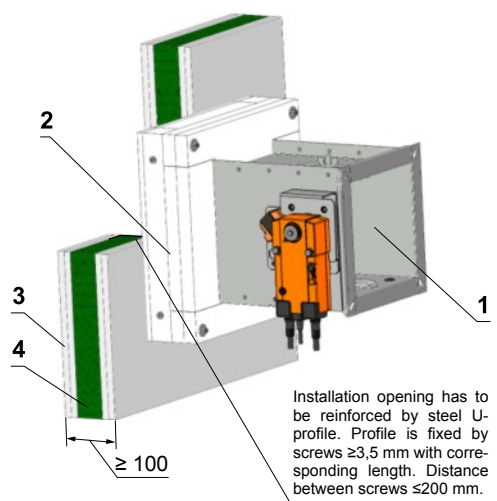
Installation frame E1



Installation frame E3



Installation frame E4

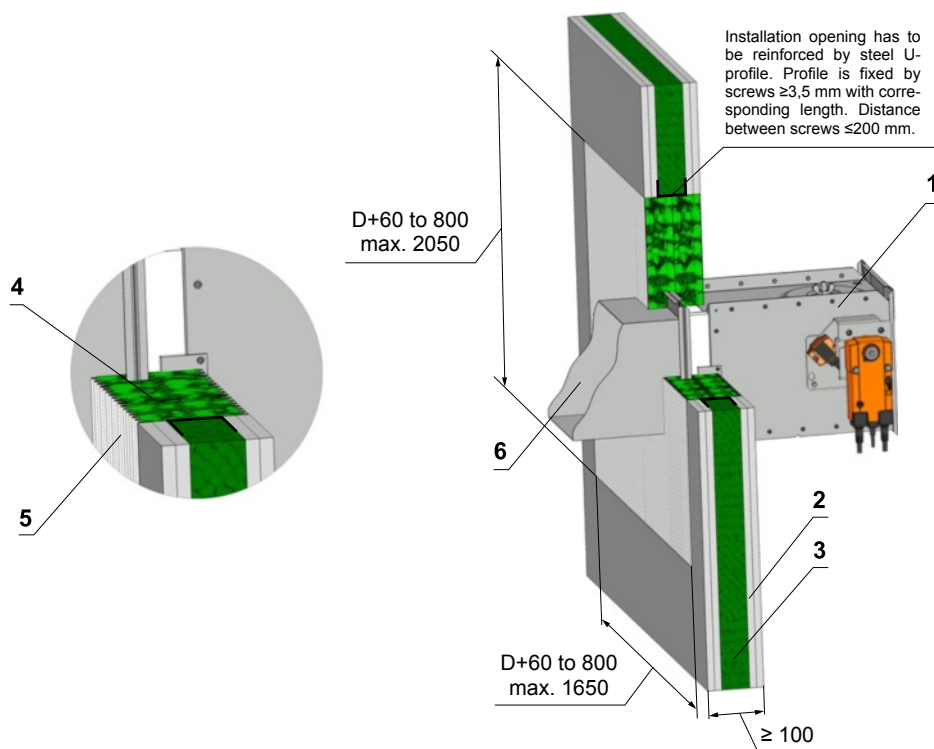


Position:

- 1 Fire damper
- 2 Installation frame
- 3 Gypsum plate
- 4 Mineral wool (type depending on the type of construction)

Gypsum wall construction - Weichschott

EIS 90



Position:

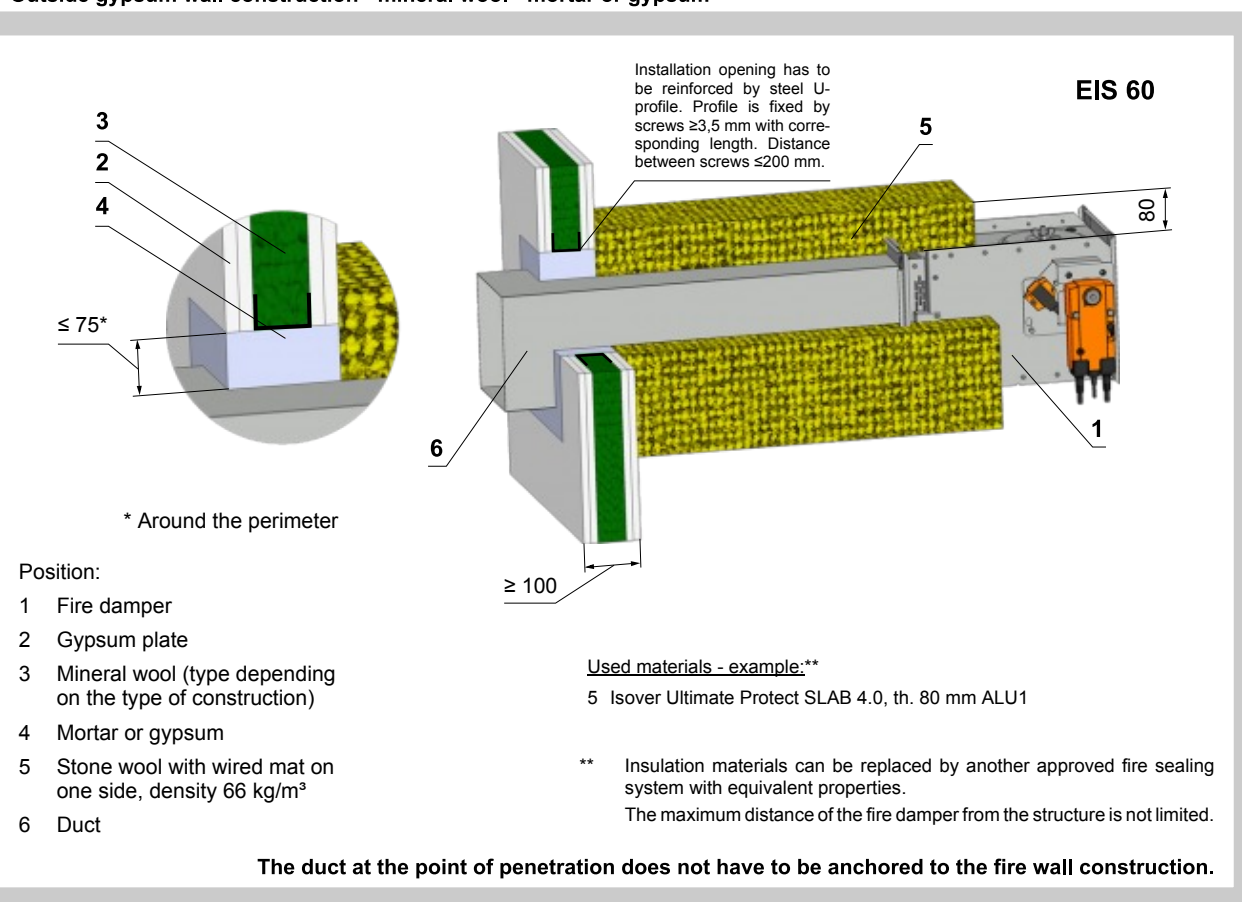
- 1 Fire damper
- 2 Gypsum plate
- 3 Mineral wool (type depending on the type of construction)
- 4 Fire resistant board
- 5 Fire stop coating thickness 1 mm
- 6 Duct

Used materials - example:

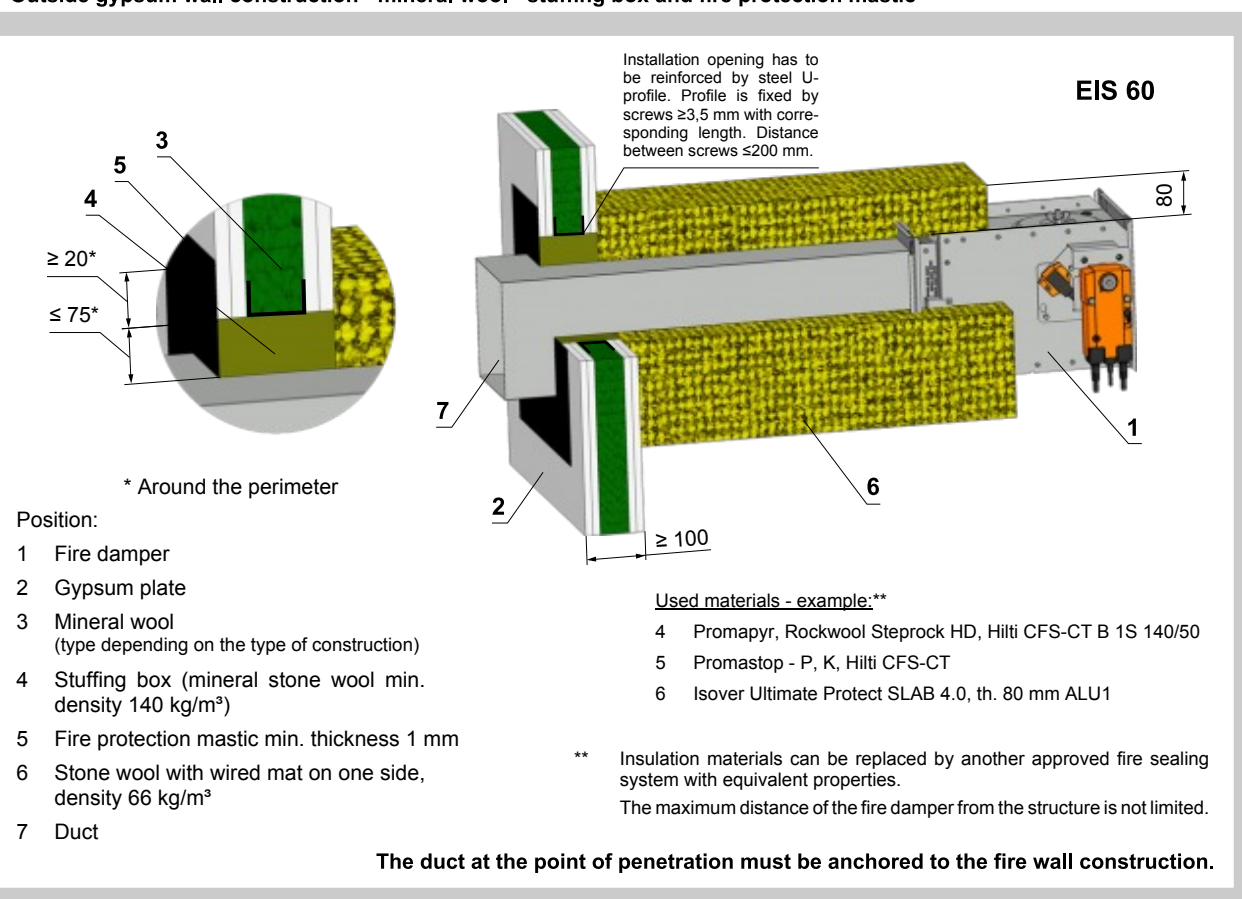
- 3 Hilti CFS-CT B 1S 140/50
- 4 Hilti CFS-CT

Installation outside gypsum wall construction

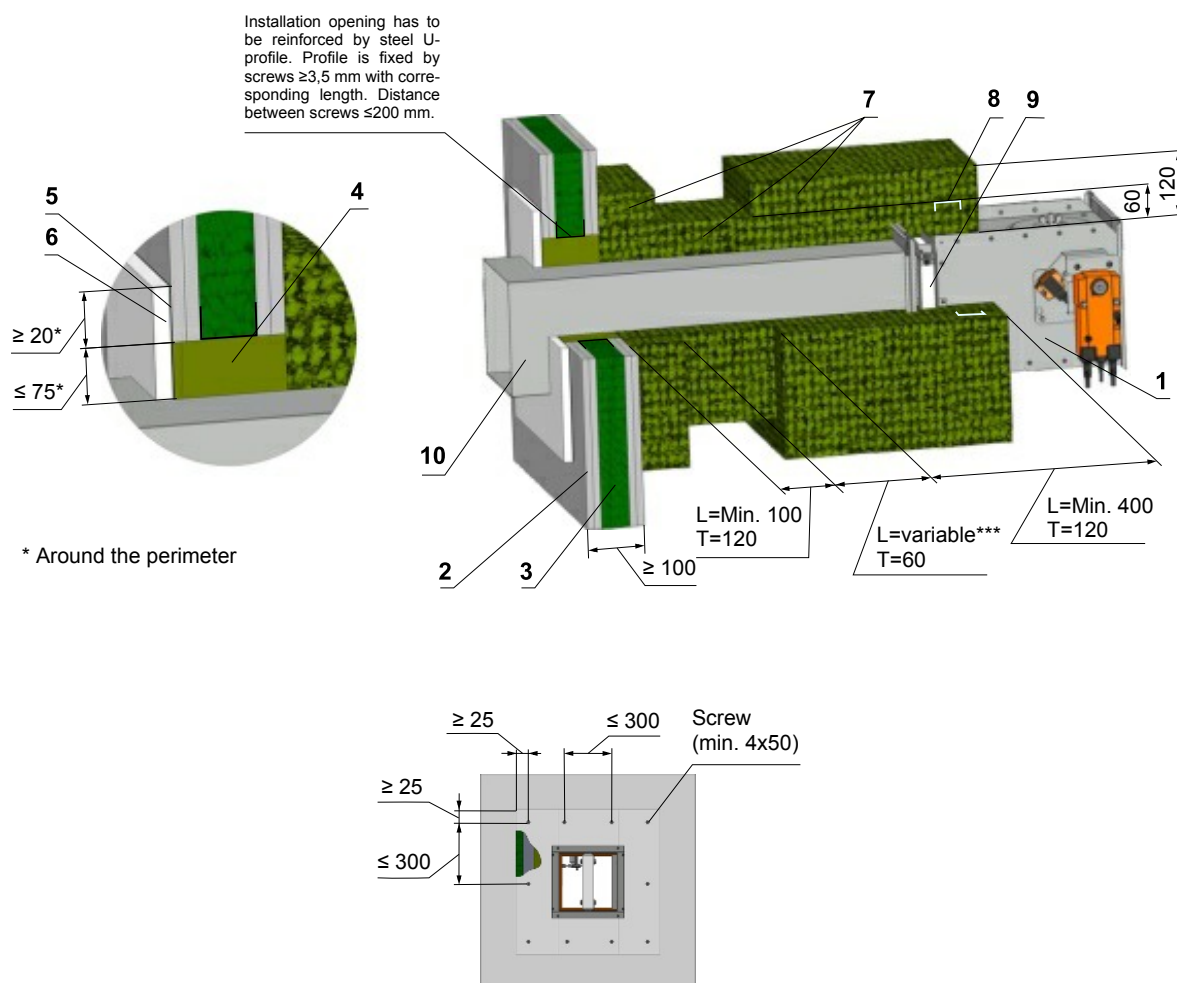
Outside gypsum wall construction - mineral wool - mortar or gypsum



Outside gypsum wall construction - mineral wool - stuffing box and fire protection mastic



Outside gypsum wall construction - mineral wool, stuffing box, fire protection mastic and cement lime plate

EIS 90
EIS 120 *****

Screws has to be fixed in wall/ceiling construction.
(If it is needed use steel bracket).

Used materials - example:**

- 4 Promapyr. Rockwool Steprock HD. Hilti CFS-CT C 1S 140/50
- 5 Promastop - P, K, Hilti CFS-CT
- 6 Promatect - H
- 7 Rockwool Conlit Ductrock EIS 90, th. 60 mm

Position:

- 1 Fire damper
- 2 Gypsum plate
- 3 Mineral wool (type depending on the type of construction)
- 4 Mineral stone wool min. density 140 kg/m^3
- 5 Fire protection mastic min. thickness 1 mm
- 6 Cement lime plate min. thickness 15 mm (min. density 870 kg/m^3)
- 7 Stone wool bound with use of an organic resin with crushed stone as a refrigerant, min. density 300 kg/m^3 and min. thickness 60 mm
- 8 Profil U25x40x25
- 9 VRM*****
- 10 Duct

** Stuffing box, fire protection mastic, cement lime plate and insulation materials can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

*** Depends on the distance of the flap from the construction, when the maximum distance from the construct is not limited and according to EN 15882-2 must use the required number of hinges according to EN 1366-1:2014.

**** Reinforcement fixing VRM
Installation of profile U25x40x25

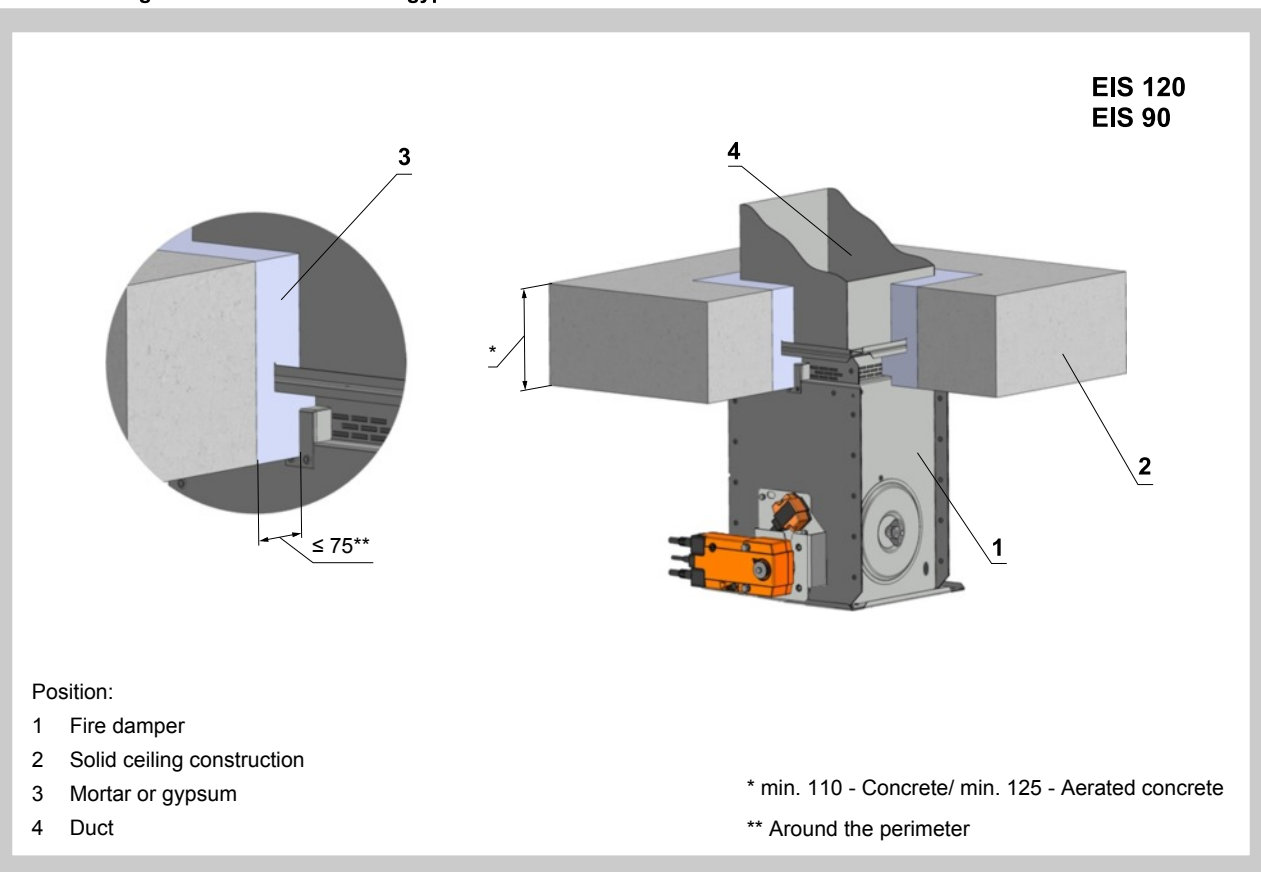
***** When using Rockwool Conlit Ductrock EIS 120, th. 60 mm, the overall fire resistance of the EIS 120 can be achieved.

T - thickness of the insulation (mm)

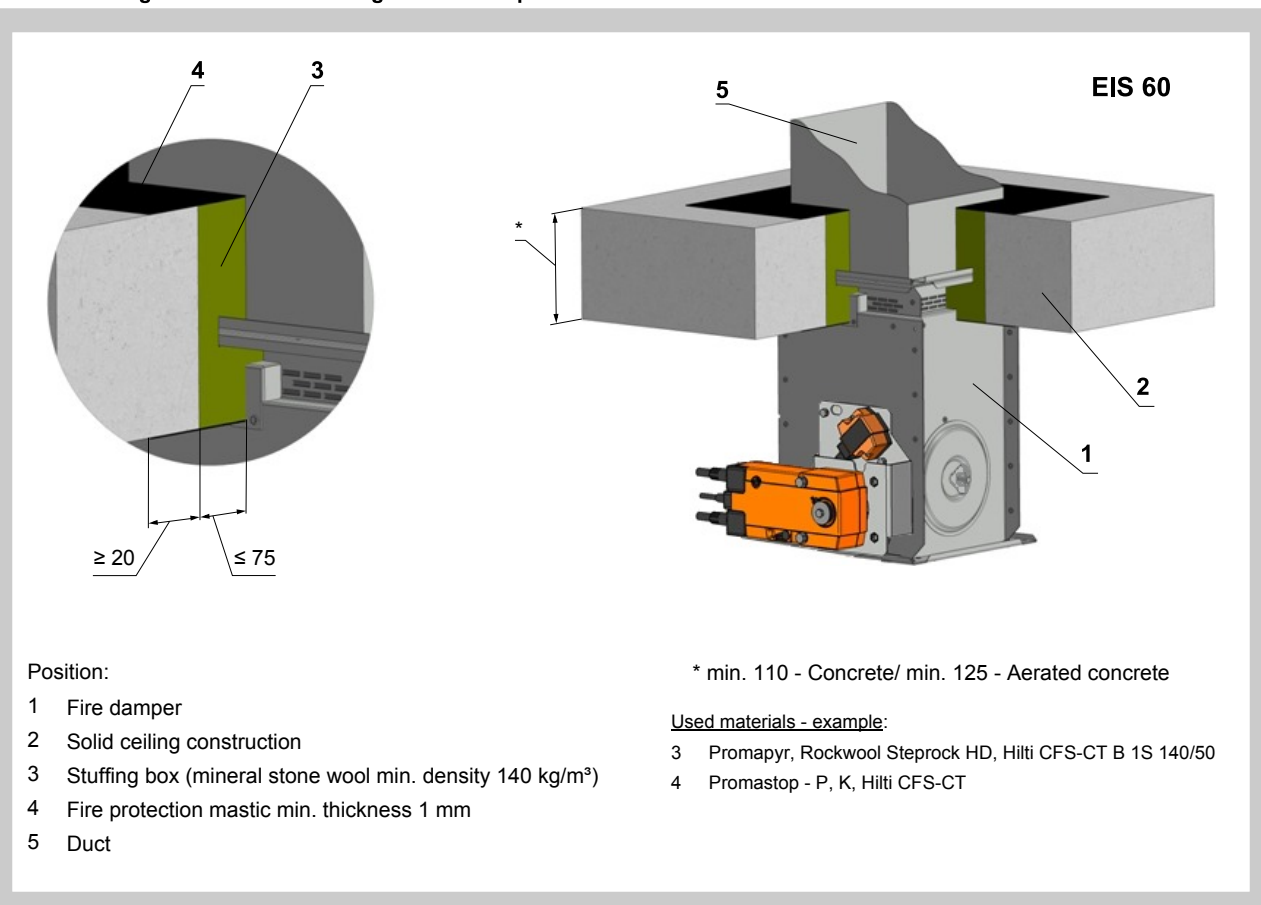
The duct at the point of penetration must be anchored to the fire wall construction.

Installation in solid ceiling construction

Solid ceiling construction - mortar or gypsum

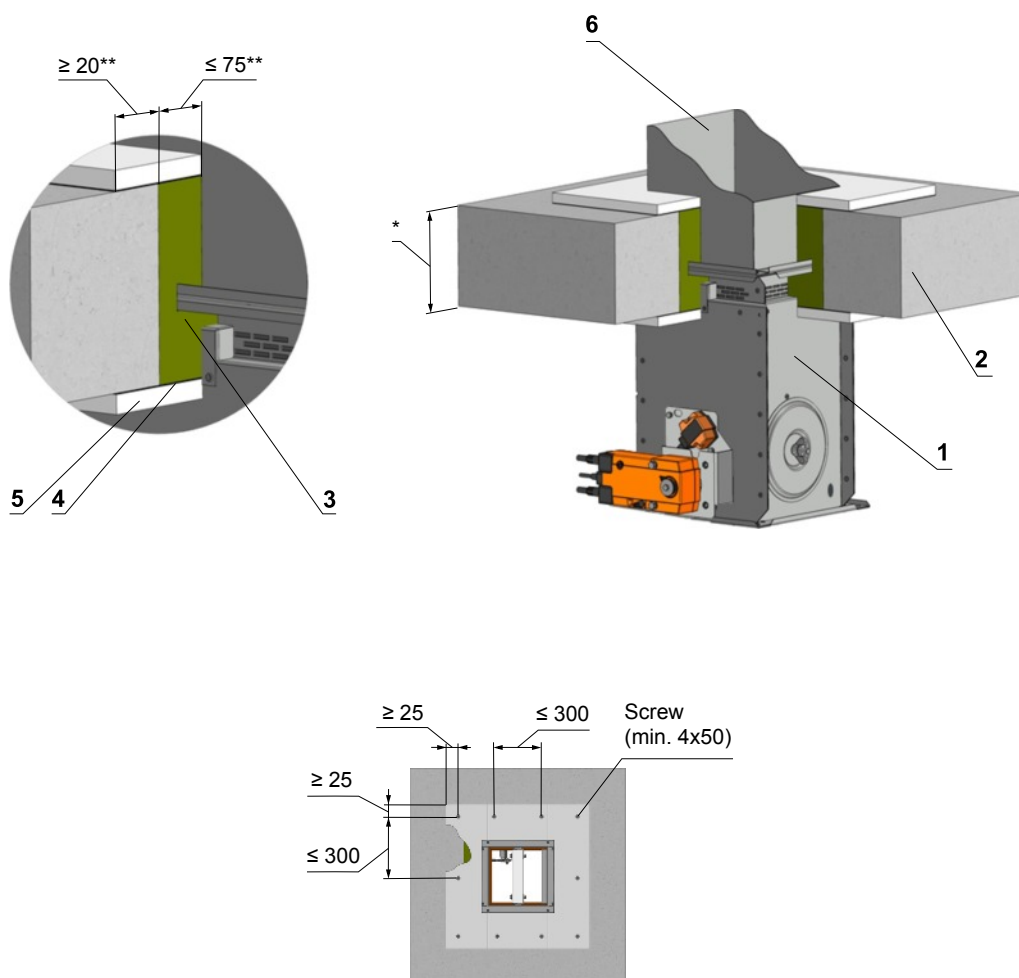


Solid ceiling construction - stuffing box and fire protection mastic



Solid ceiling construction - stuffing box, fire protection mastic and cement lime plate

EIS 90



Screws has to be fixed in wall/ceiling construction.
(If it is needed use steel bracket).

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

** Around the perimeter

Used materials - example:

- 3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
- 4 Promastop - P, K, Hilti CFS-CT
- 5 Promatect - H

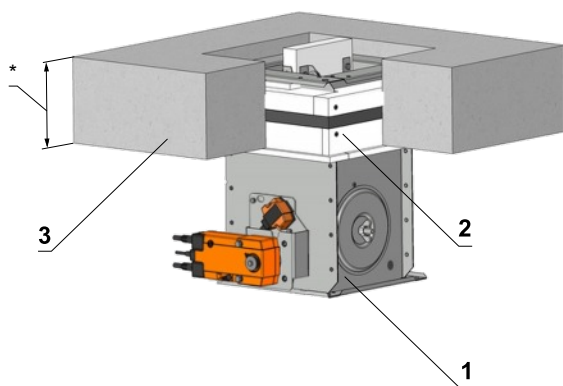
Position:

- 1 Fire damper
- 2 Solid ceiling construction
- 3 Stuffing box (mineral stone wool min. density 140 kg/m³)
- 4 Fire protection mastic min. thickness 1 mm
- 5 Cement lime plate min. thickness 15 mm, min. density 870 kg/m³
- 6 Duct

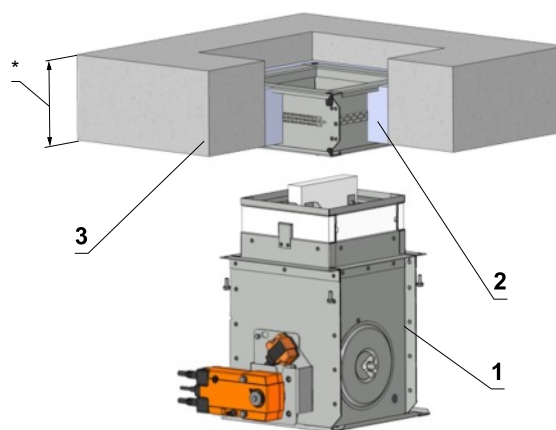
Solid ceiling construction - installation frame E1, E2, E4

EIS 90

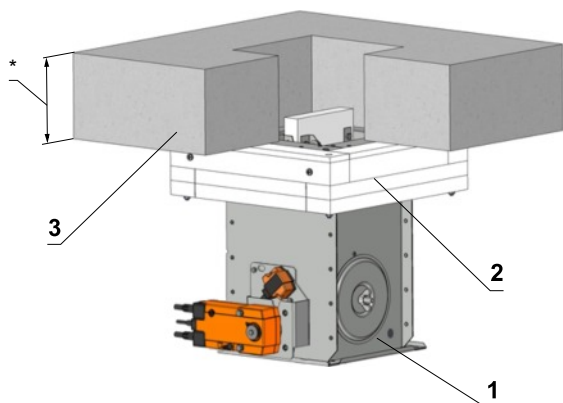
Installation frame E1



Installation frame E2



Installation frame E4



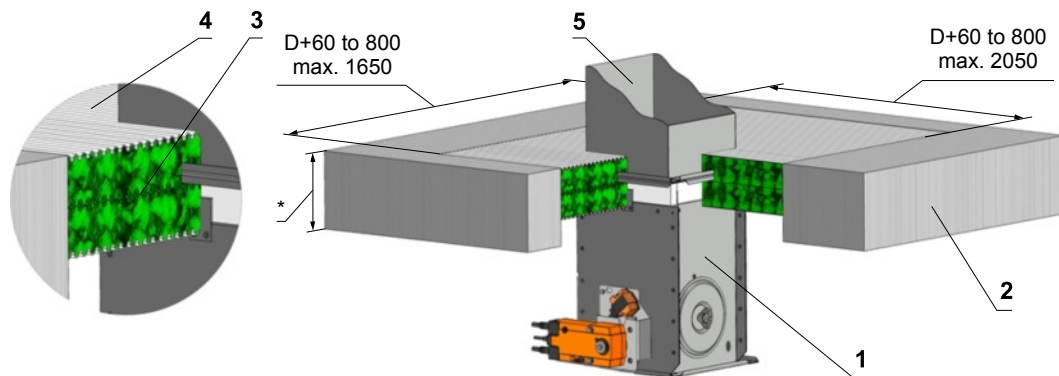
Position:

- 1 Fire damper
- 2 Installation frame
- 3 Solid ceiling construction

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

Solid ceiling construction - Weichschott

EIS 90



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

Position:

- 1 Fire damper
- 2 Solid ceiling construction
- 3 Fire resistant board
- 4 Fire stop coating thickness 1 mm
- 5 Duct

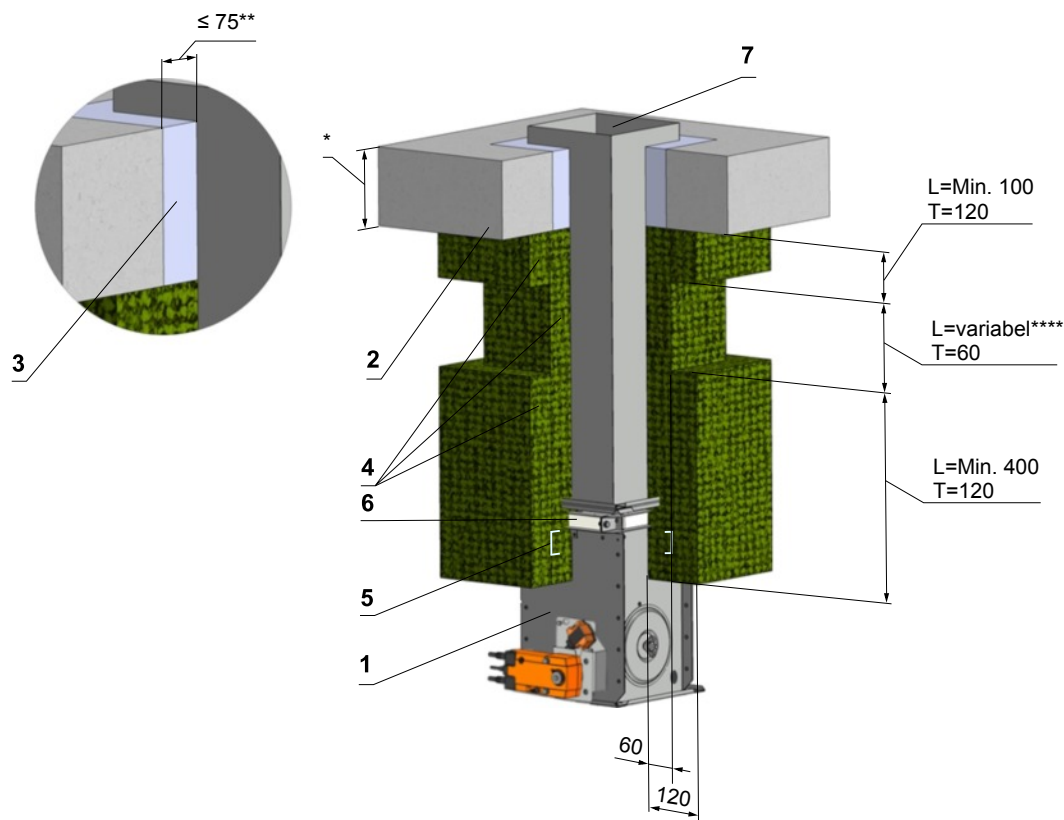
Used materials - example:

- 3 Hilti CFS-CT B 1S 140/50
- 4 Hilti CFS-CT

Installation outside solid ceiling construction

Outside solid ceiling construction - mineral wool - mortar or gypsum

EIS 90
EIS 120 *****



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

** Around the perimeter

Used materials - example:***

4 Rockwool Conlit Ductrock EIS 90, th. 60 mm

Position:

- 1 Fire damper
- 2 Solid ceiling construction
- 3 Mortar or gypsum
- 4 Stone wool bound with use of an organic resin with crushed stone as a refrigerant, min. density 300 kg/m³ and min. thickness 60 mm
- 5 Profil U25x40x25
- 6 VRM*****
- 7 Duct

*** Stuffing box, fire protection mastic, cement lime plate and insulation materials can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

**** Depends on the distance of the flap from the construction, when the maximum distance from the construct is not limited and according to EN 15882-2 must use the required number of hinges according to EN 1366-1:2014.

***** Reinforcement fixing VRM
Installation of profile U25x40x25

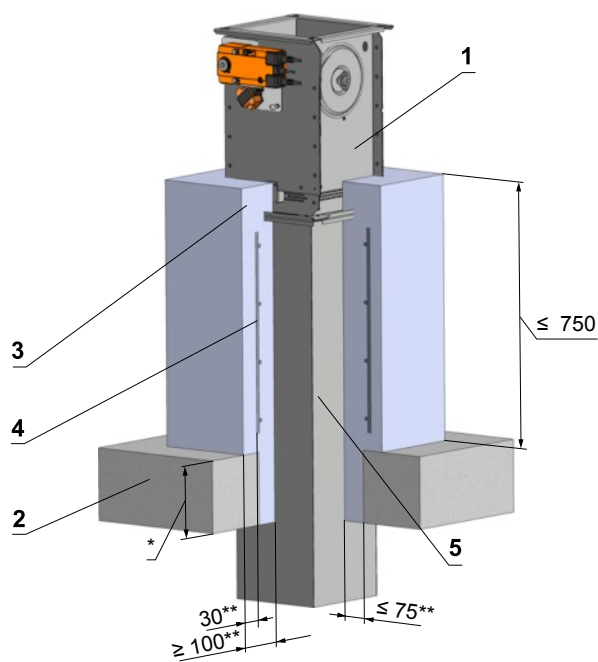
***** When using Rockwool Conlit Ductrock EIS 120, th. 60 mm, the overall fire resistance of the EIS 120 can be achieved.

T - thickness of the insulation (mm)

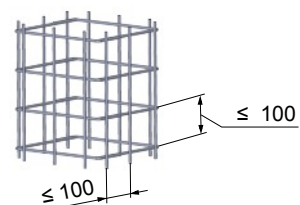
The duct at the point of penetration does not have to be anchored to the fire wall construction.

Outside solid ceiling construction - concrete

EIS 90



Rebar - Steel wire Ø 6 mm



Position:

- 1 Fire damper
- 2 Solid ceiling construction
- 3 Concrete B20
- 4 Rebar
- 5 Duct

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

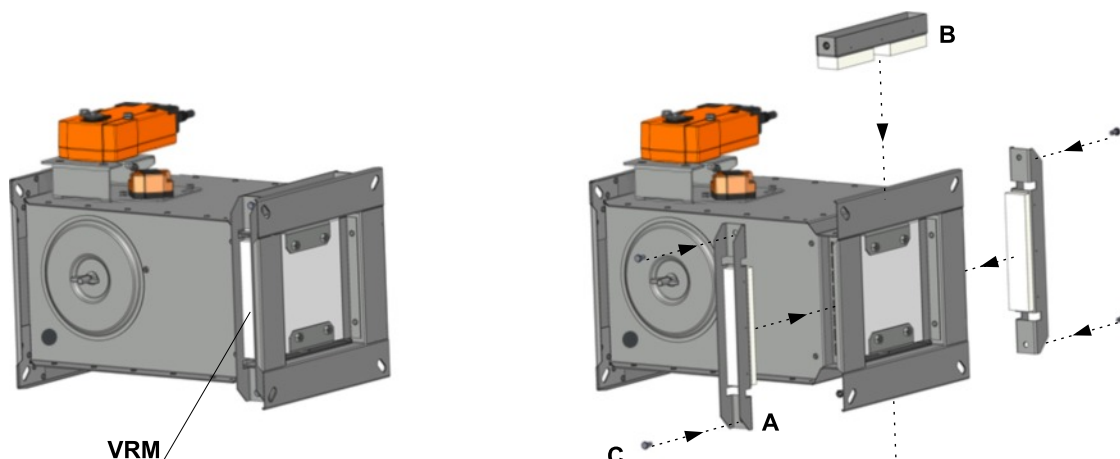
** Around the perimeter

VRM reinforcing frame

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

Fixing of reinforcement to damper body VRM

Important: For lower fire resistance than EI90 the reinforcement VRM is not necessary !!!

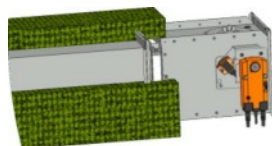


- 1.) Insert part A, B on body of fire damper in correct position
- 2.) Lock screw C
- 3.) It has to be done on each corner of VRM

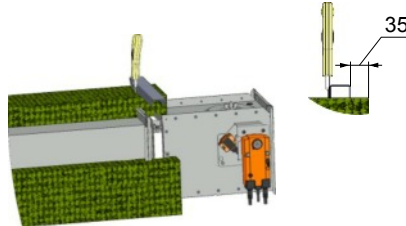
Installation procedure

1) Cut the groove for profil U25x40x25

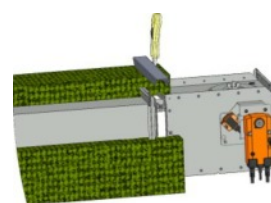
EIS 90
EIS 120



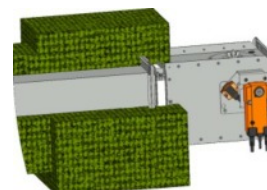
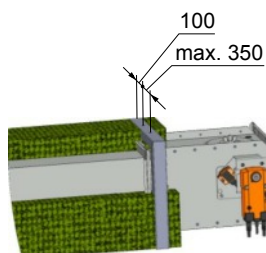
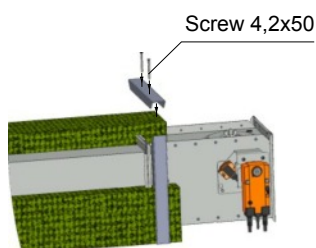
2) Insert profile into groove



3) Fix profile

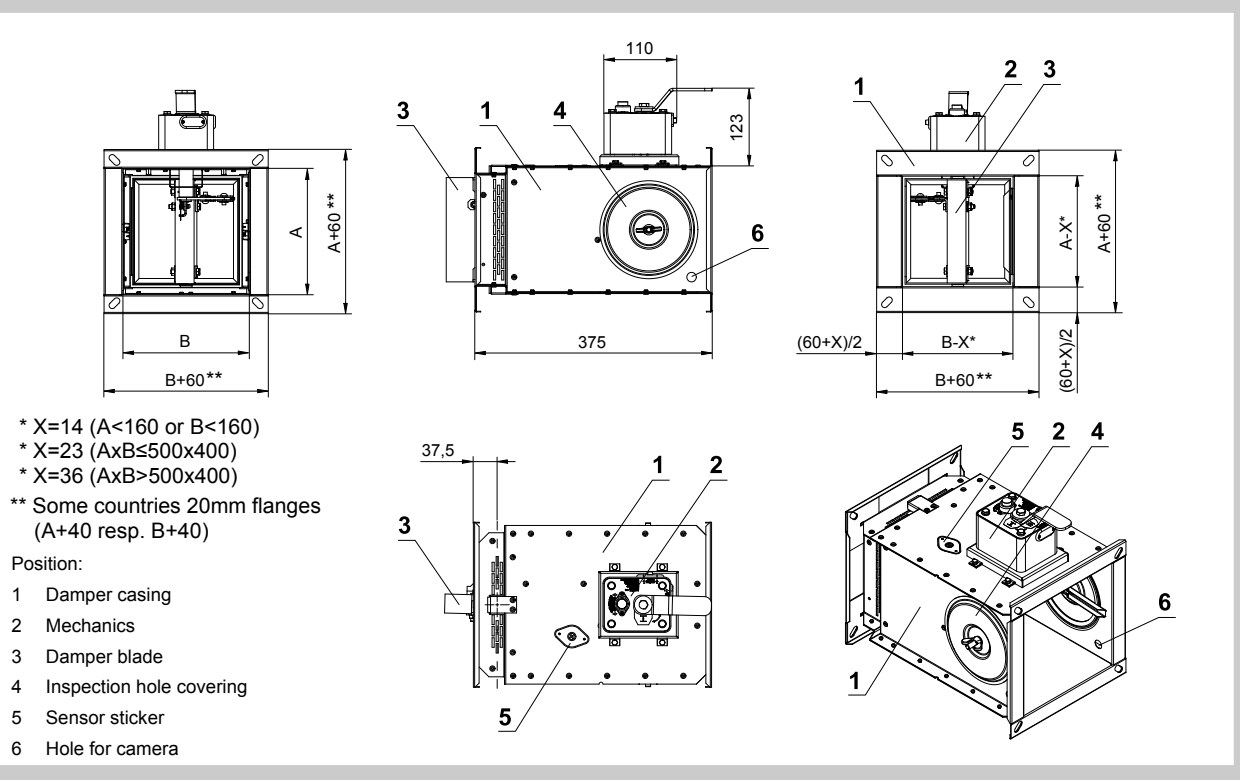


4) Fix second layer of insulation

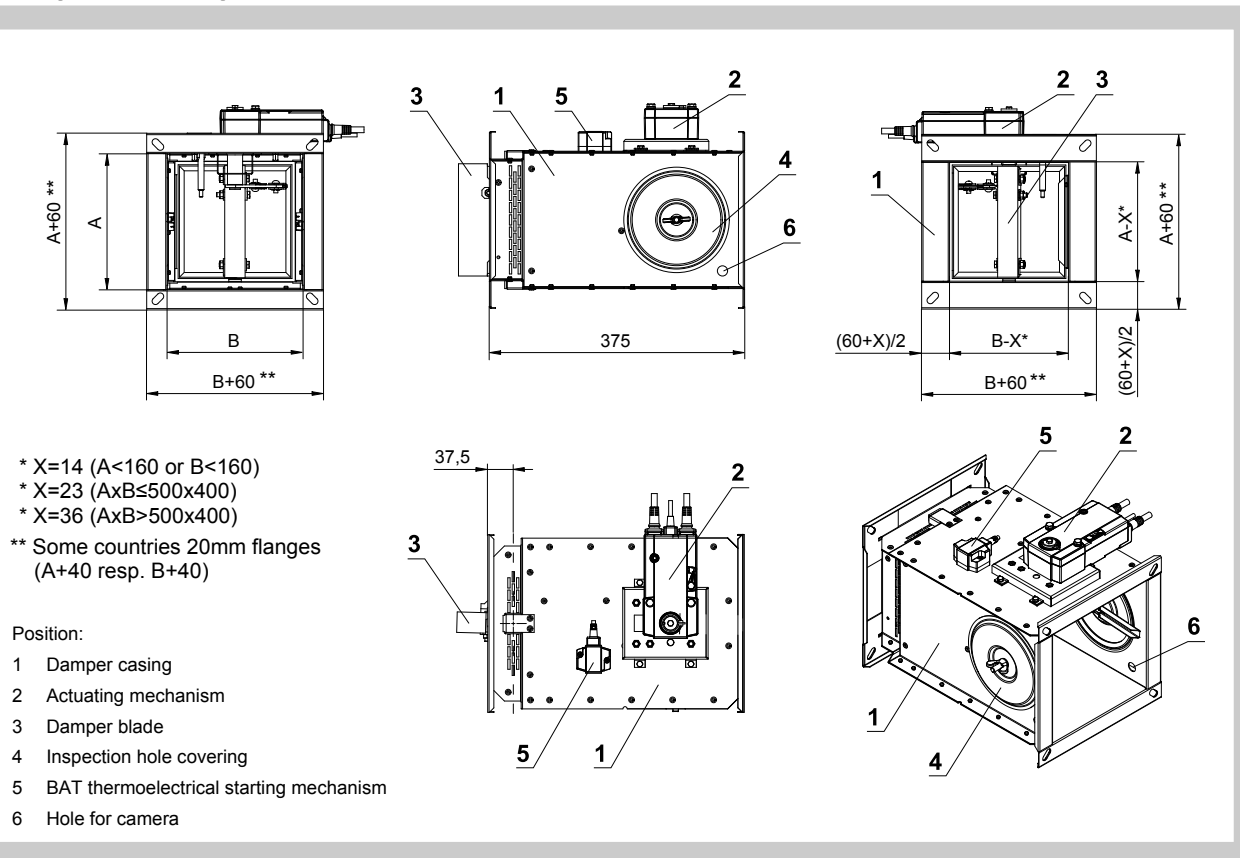


Dimensions

Design with mechanical control



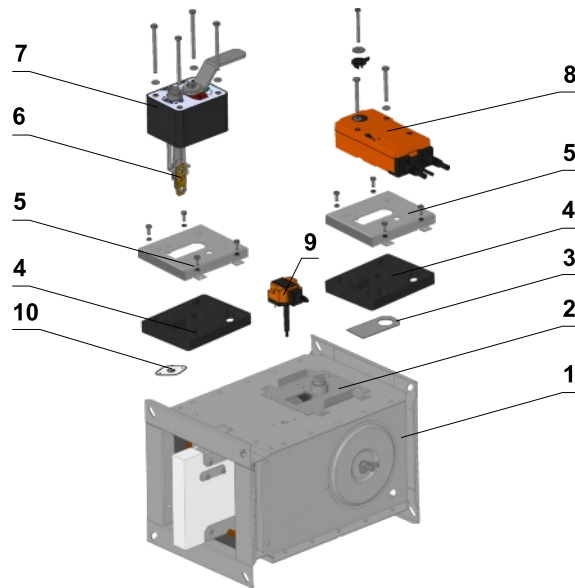
Design with actuating mechanism



Change of mechanical design for the motorised one or vice versa

Position:

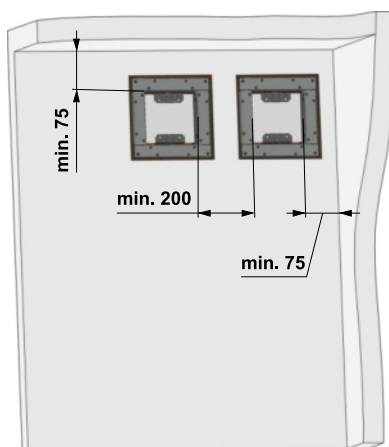
- 1 Damper
- 2 Mounting plate
- 3 Sealing cover
- 4 Seal plates
- 5 Mounting plate cover
- 6 Thermal fuse
- 7 Mechanics
- 8 Actuator
- 9 Temperature sensor
- 10 Sensor sticker



Installation instructions

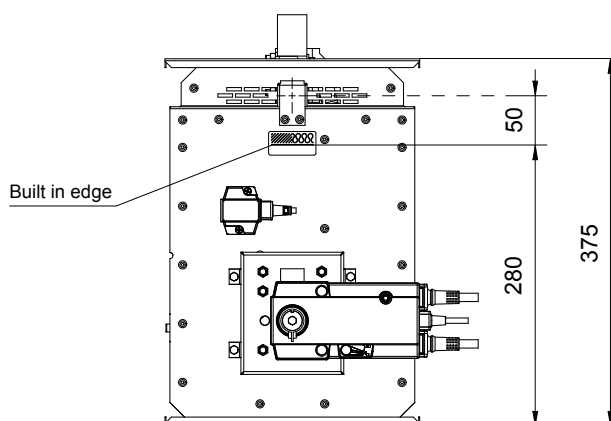
1. During the installation process, the blade position must be "CLOSED".
2. During the installation process, the control mechanism must be protected against pollution and damage.
3. Fire dampers are suitable for installation in any position in vertical and horizontal passages of fire separating structures.
4. The gap between the installed damper and structure must be completely filled with approved material.
5. The distance between the fire damper and structure (wall, ceiling) must be at least 75 mm. If two or more dampers are to be installed in one fire separating structure, the distance between the adjacent dampers must be at least 200 mm.

Installation of two and more dampers in one fire separating structure



6. The damper blade (in its closed position) must be inside of the fire separating structure. The fire damper may also be installed outside the wall structure. The piping and damper part between the wall structure and damper blade (marked with the BUILT-IN EDGE label on the damper body) must be protected by fire insulation.

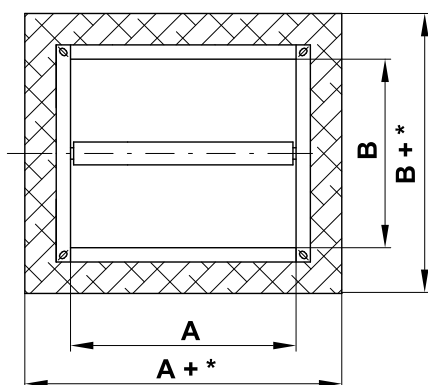
Built-in edge



"Wall edge sticker" indicates the recommended edge of installation of fire damper into the fire partition structure (wall). The damper must be installed so that the entire damper blade - in the closed position - is located inside the fire separating structure (wall) and at the same time the control mechanism and inspection openings are freely accessible.

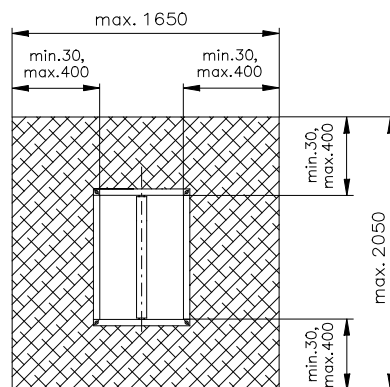
Installation opening dimensions

Installation opening



* min. $A(B)+50$ (flange 20mm)
 min. $A(B)+70$ (flange 30mm)
 max. $A(B)+150$

Installation opening - Weichschott system

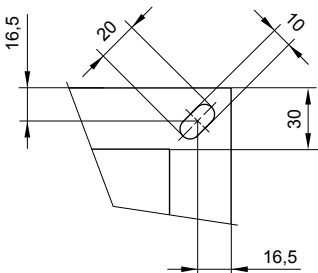


7. The damper body must not get deformed during its installation process. Once the damper is built installed, its blade must not grind on the damper body during its opening or closing.
8. To provide needed access space to the control device, all the other objects must be situated at least 350 mm away from the damper control parts. At least one inspection hole must be accessible.

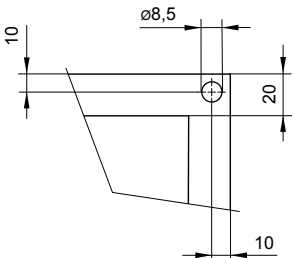
9. Flanges of dampers

Flange of Damper - OPERATORS SIDE

Flange 30mm

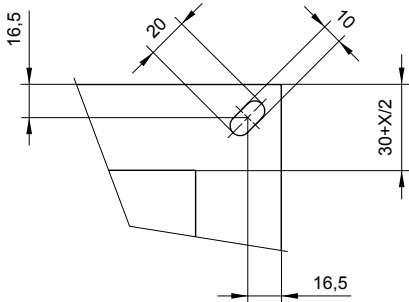


Flange 20mm

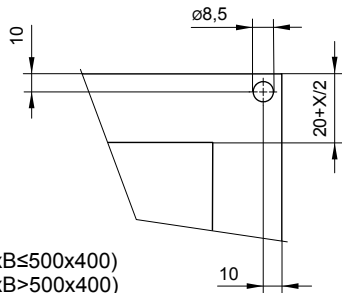


Flange of Damper - INSTALLATIONS SIDE

Flange 30mm



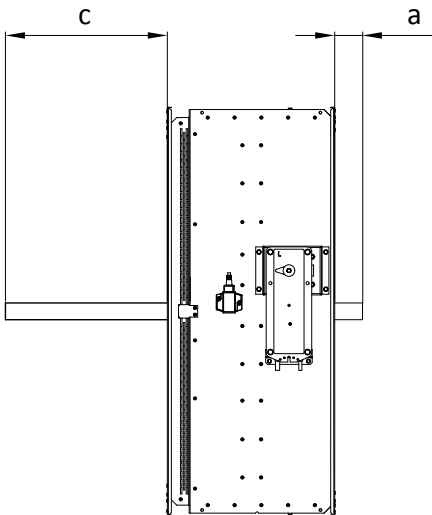
Flange 20mm



X=23 (AxB≤500x400)
X=36 (AxB>500x400)

10. Damper blade overlaps

Damper blade overlaps



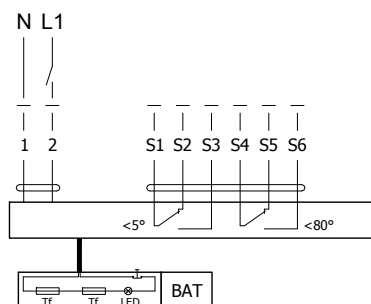
Damper blade overlaps

AxB	a [mm]	c [mm]	AxB	a [mm]	c [mm]
Ax100	-	-	Ax400	-	140
Ax110	-	-	Ax450	-	165
Ax125	-	-	Ax500	-	190
Ax140	-	5	Ax550	-	215
Ax150	-	15	Ax560	-	220
Ax160	-	20	Ax600	-	240
Ax180	-	30	Ax630	-	255
Ax200	-	40	Ax650	-	265
Ax225	-	52,5	Ax700	-	290
Ax250	-	65	Ax710	-	295
Ax280	-	80	Ax750	15	315
Ax300	-	90	Ax800	40	340
Ax315	-	97,5	Ax900	90	390
Ax355	-	117,5	Ax1000	140	440

11. Wiring diagrams

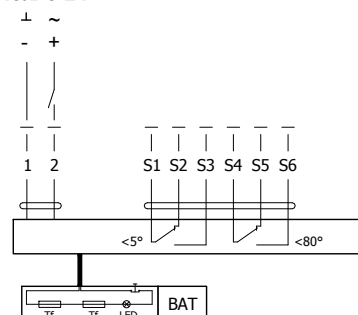
Actuator BELIMO BFL, BFN 230-T

AC230 V



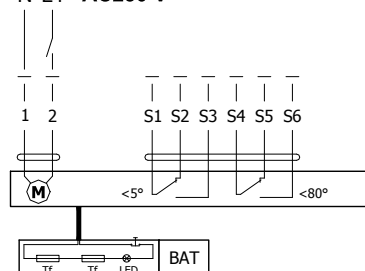
Actuator BELIMO BFL, BFN 24-T(-ST)

AC/DC 24

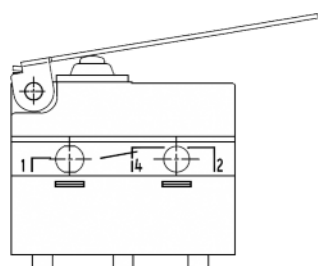


Actuator BELIMO BF 24-TN(-ST), BF 230-TN

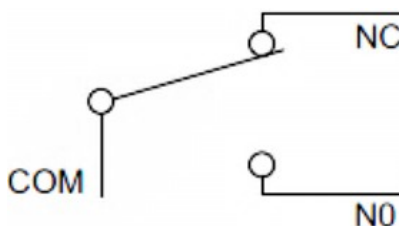
+ ~ AC 24 V
 - + DC 24 V
 N L1 AC230 V



Limit switch G905-300E03W1



Nominal voltage and maximal current	AC 230V / 5A
Class of protection	IP 67
Working temperature	-25°C ... +120°C



1(COM) - black wire
 2(NC) - gray wire
 4(NO) - blue wire

This limit switch is possible to connect in following two versions:

- CUT-OFF if the arm is moving ... connect wire 1+2
- SWITCH-ON if the arm is moving ... connect wire 1+4

12. Before commissioning the dampers and during their subsequent operational checks, it is necessary to check and functionally test all the designs, including the operation of any electronic elements. Upon commissioning, these operational checks must be completed at least twice a year. If no defect is found during two consecutive operational checks, then operational checks may be completed once a year.

13. Prior to the commissioning of the dampers and subsequent operational checks, the following checks must be completed with all the designs:

Visual inspection for proper damper installation, damper interior, damper blade, blade seating surfaces, and silicone seal.

Removing the inspection opening cover: Turn the wing nut to loosen the cover and move the cover left or right to release it from the locking bracket. Then tilt the lid back from its original position.

14. For dampers with mechanical control (designs .01, .11, .80), the following checks must be carried out:

Check of closing mechanism and thermal fuse

To check the function of the mechanism proceed as follows:

Move the damper blade to "CLOSED" position as follows:

- The damper is in "OPEN" position.
- Press the control button of the mechanism to move the damper to "CLOSED" position.
- Check the damper blade shift to "CLOSED" position.
- Damper closing shall be sharp, the control lever shall be in „CLOSED“ position.

Move the damper blade to "OPEN" position as follows:

- Turn the control lever by 90°.
- The lever will automatically lock in "OPEN" position.
- Check the damper blade shift to "OPEN" position.

Check of function and condition of the thermal fuse:

- To check the function and the status of the fuse is possible to remove whole mechanism from the body of fire damper - mechanism is attached to the dampers body with four screws M6.
- Removing the thermal fuse from the fuse holder of initiation device, check its correct functionality.
- The mechanism is identified as M1 to M4, depending on the closing spring strongness.

15. The actuator design must be checked as follows:

The blade turn to its breakdown "CLOSED" position may be checked upon cutting off the actuator power supply (e.g. by pressing the RESET button at the thermoelectric starting mechanism BAT or by cutting off the fire alarm power supply). The blade turn back to its "OPEN" operating position may be checked upon restoration of power supply (e.g. by releasing the RESET button or restoration of the fire alarm power supply).

16. Actuator control without electric voltage:

A special lever (part of the actuator) may be used to manually set the dampers to any position. When the lever is turned in the direction of the arrow, the damper blade turns to its open position. As the blade movement is stopped, in every position, the actuator will be locked. Unlocking is possible even manually as per instructions on the actuator, or by the activation of the supply voltage.

WARNING!

If the actuator is manually locked, the damper blade will not close in the event of a fire after the activation of the BAT thermoelectric trigger. To restore correct damper operation, the actuator must be unlocked (manually or by applying power supply)

17. Installation, maintenance, and operational checks of the dampers may only be completed by persons qualified for these activities, i.e. "AUTHORIZED PERSONS: trained by the manufacturer.

The dampers must be installed in compliance with all the applicable safety standards and regulations.

18. Actuator reset after the fuses activation:

If the thermal protection fuse Tf1 (for the temperature around the fire damper) is burned, it is necessary to replace the actuator, including the thermoelectric trigger.

If the thermal protection fuse Tf2 (for the temperature inside the piping) is burned, separate spare part ZBAT72 or ZBAT95 may be replaced (according to the starting temperature).

Material and Surface Finish

- The damper bodies are normally supplied in their galvanized sheet steel design (alternatively stainless steel) without any additional surface finish.
- The damper blades are made of asbestos-free fire-resistant mineral fibre boards.
- The damper control devices are made of galvanized materials (alternatively of stainless steel) without any additional surface finish.
- The springs are galvanized (alternatively made of stainless steel).
- The thermal protection fuses are made of brass sheet 0.5 mm thick.
- The connecting material is galvanized (alternatively made of stainless steel).

MANDÍK, a.s.
Dobříšská 550
26724 Hostomice
Czech Republic
Tel.: +420 311 706 706
E-Mail: mandik@mandik.cz
www.mandik.com

The producer reserves the right for innovations of the product. For actual product information see
www.mandik.com