NORDfire

FDMQ Fire Damper

- Square dampers from 150×150 mm to 1 500×800 mm
- CE certified acc. to EN15650
- Fire resistance up to EIS 120
- External Casig leakage class C, Internal leakage class 2 acc. to EN 1751
- Damper actuating mechanical, or electrical

ETS NORD

General information

1. Description

1.1 Fire dampers are shutters in ducts of air-conditioning devices that prevent spreading the fire and combustion products from one fire segment to the other one by means of closing the duct in the points of fire separating constructions.
Dampers blade automatically closes air duct using a shutting spring or an actuating mechanism back spring. The shutting spring is started by releasing an initiation lever. The impulse for releasing the lever can be either a manual one, a thermal one. The back spring of the actuating mechanism is started when the thermoelectrical starting mechanism BAT is activated, when a reset button on BAT is pushed or when a power supply of the actuating mechanism is stopped.
The damper is sealed with a silicon packing against smoke penetration after closing the blade. At the same time, the damper blade is bedded in a material which enlarges its capacity and air proofs the air duct.
Dampers have two inspection holes.

Fig.1 FDMQ with actuating mechanism

Fig. 2 FDMQ with mechanical control

1.2 Damper characteristics

- CE certified acc. to EN 15650
- Tested in accordance with EN 1366-2
- Classified acc. to EN 13501-3+A1
- Fire resistance EIS 120, EIS 90
- External Casing leakage class C, Internal leakage class 2 acc. to EN 1751
- Cycling test in class C 10000 acc. to EN 15650
- Corrosion resistant acc. to EN 15650
- ES Certificate of conformity No. 1391-CPR-2021/0144
- Declaration of Performance No. PM/FDMQ/01/21/3
- Hygienic assessment of fire dampers - Report No. 1.6/pos/19/19b

1.3 Working conditions

Right damper function is secured under the following conditions:

a) Maximum air circulation speed: 12 m/s
Maximum pressure difference: 1200 Pa

b) The air circulation in the whole damper section must be secured as steady on whole surface.

Operation of the dampers does not depend on the direction of air circulation. The dampers can be located in an arbitrary position.

Dampers are suitable for systems without abrasive, chemical and adhesive particles.

Dampers are designed for macroclimatic areas with mild climate according to EN 60 721-3-3.

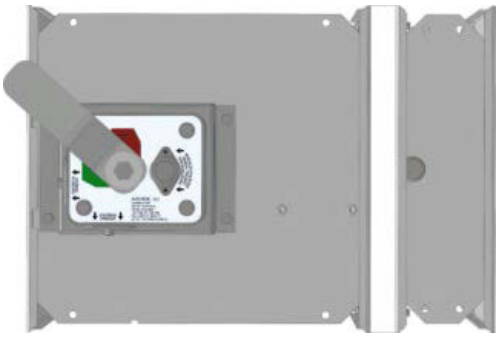
Temperature in the place of installation is permitted to range from -20°C to +50°C.

2. Design

2.1 Design with mechanical control

Design .01

Design with mechanical control with a thermal protective fuse which actuates the shutting device, after the nominal start temperature 72°C has been reached. Automatic initiation of the shutting device is not activated if the temperature does not exceed 70°C. In case that other start temperatures are required, thermal fuses with nominal start temperature +104°C or +147°C can be supplied (this requirement must be specified in the order).



ATTENTION:

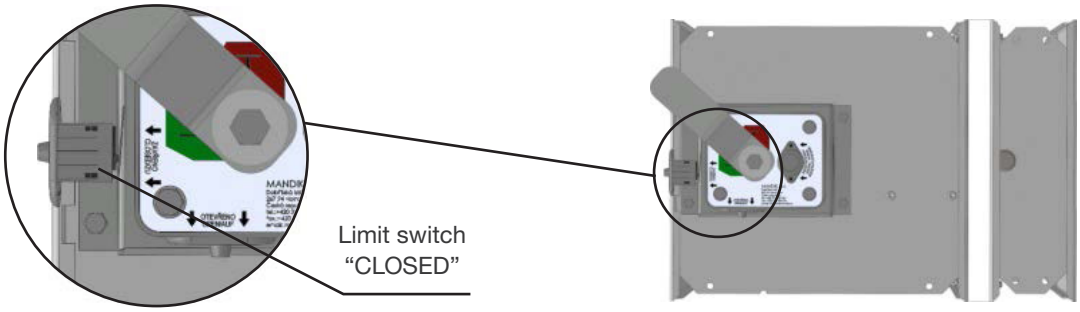
Mechanisms are produced in four designs **M1** to **M5**, difference is only in size of inner spring, which closes the fire damper. For the size of fire dampers is always assigned the size of mechanism - **Tab 4.2.1.** It is not recommended to use different size of mechanism, than given by the manufacturer, otherwise, there is a risk of fire damper destruction.

Fig. 3 Design .01

Design .11

Design .01 with mechanical control can be complemented with a limit switch signalling of the damper blade position "CLOSED". Cable is connected directly to limit switch.

Fig. 4 Design .11



Design .80

Design .01 with mechanical control can be complemented with a terminal switches signaling of the damper blade position “CLOSED” and “OPEN”. Limit switches are connected via damper casing, cables are connected directly to limit switches.

Fig. 5 Design .80

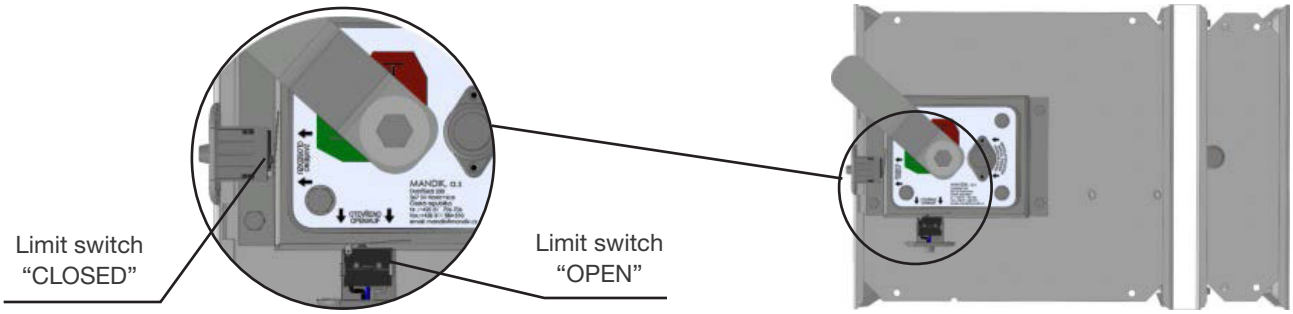
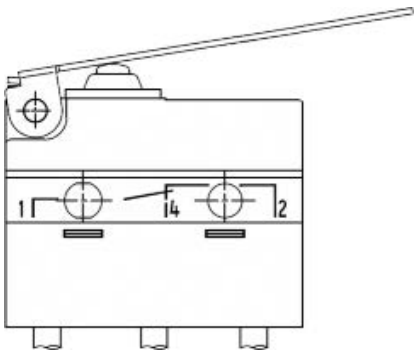
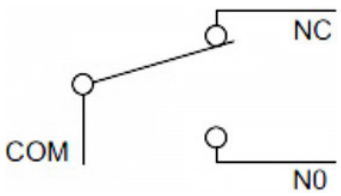


Fig. 6 Limit switch G905-300E03W1





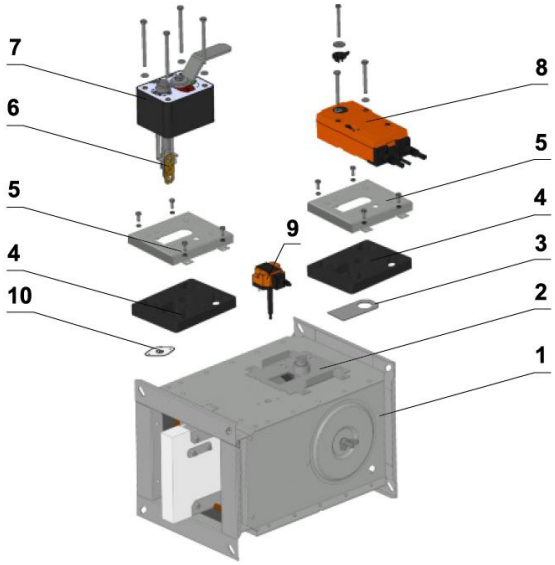
1- 1(COM) - **black wire**
2- 2(NC) - gray wire
3- 4(NO) - **blue wire**

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

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

a) **CUT-OFF** if the arm is moving … connect wire 1+2
b) **SWITCH-ON** if the arm is moving … connect wire 1+4

Fig. 7 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

2.2 Design with actuating mechanism

Design .40, .50

FDMQ is always equipped by electric actuating mechanism BFL, BFN, BF 230-TN or BFL, BFN, BF 230-TN (further only "actuating mechanism"). After being connected to power supply AC/DC 24V or 230V, the actuating mechanism displaces the damper blade into operation position "OPEN" and at the same time it pre-stretches its back spring. When the actuating mechanism is under voltage, the damper blade is in the position "OPEN" and the back spring is pre-stretched. Time needed for full opening of the flap blade from the position "CLOSED" to the position "OPEN" is maximum 120 sec. If the actuating power supply is cut off (due to loss of supply voltage, or pushing the reset button on the thermoelectrical starting mechanism BAT), the back spring displaces the damper blade into the breakdown position "CLOSED". The time of displacing the blade from the position "OPEN" to the position "CLOSED" takes maximum 20 sec. In case that the power supply is restored again (the blade can be in any position), the actuating mechanism starts to re-displace the damper blade into the position "OPEN".
A thermoelectrical starting mechanism BAT, which contains two thermal fuses Tf1 and Tf2, is a part of the actuating mechanism. These fuses are activated when temperature +72°C has been exceeded (the fuse Tf1 when the temperature around the damper and the fuses Tf2 when the temperature inside the air-conditioning piping has been exceeded). After the thermal fuse Tf1 or Tf2 has been activated, the power supply is permanently and irreversibly cut off and the actuating mechanism, by means of the pre-stretched spring, displaces the damper blade into the breakdown position "CLOSED".
Signalisation of damper blade position "OPEN" a "CLOSE" is provided by two limit switches.

Fig. 8 Design .40, .50

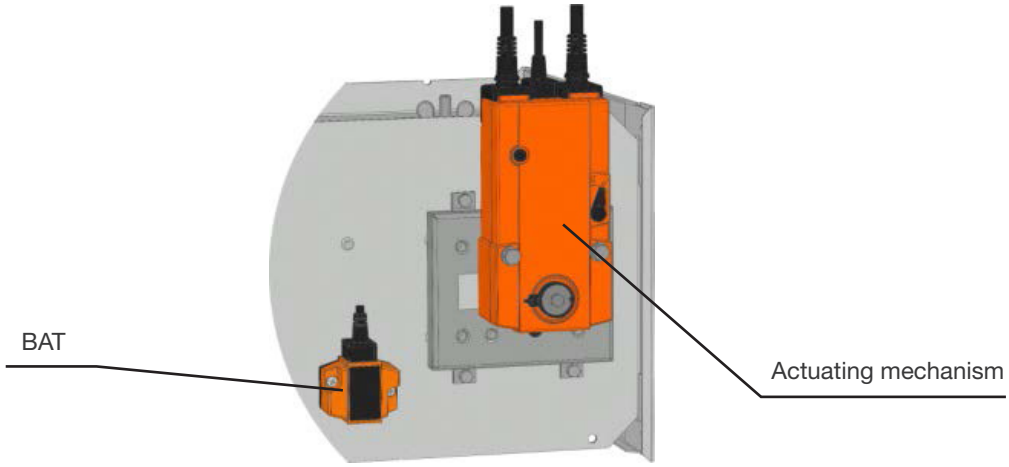


Fig. 9 Actuating mechanism BELIMO BFL BFL (BFN) 230-T

AC230 V

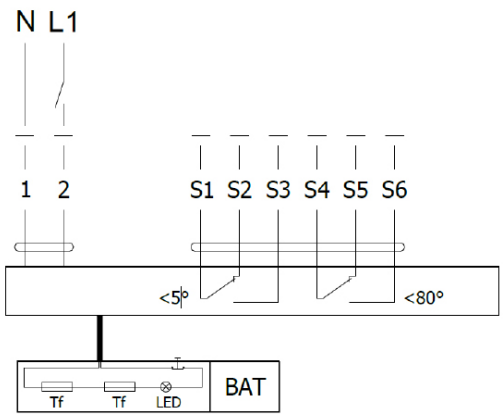
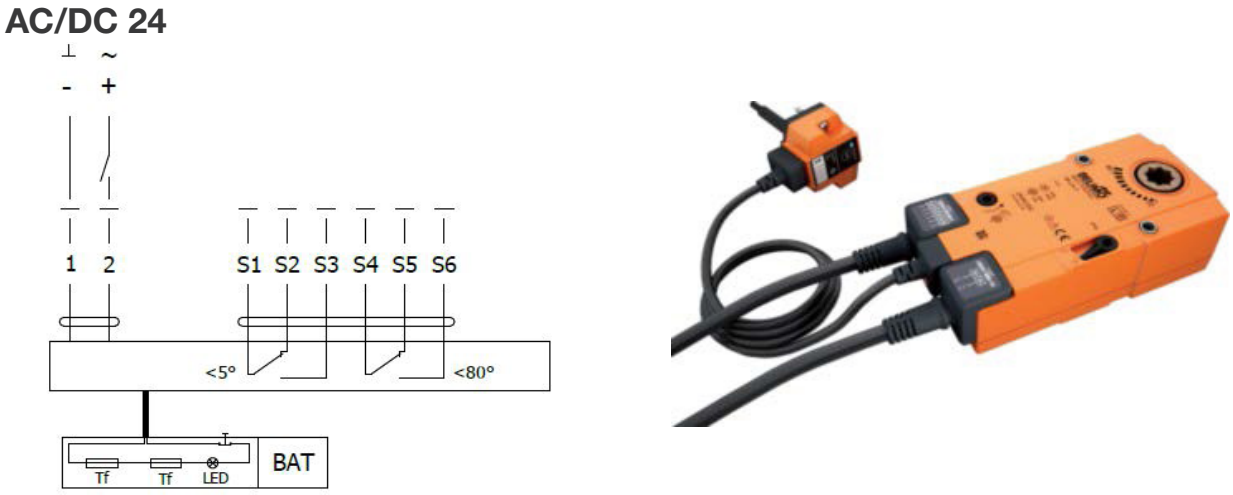


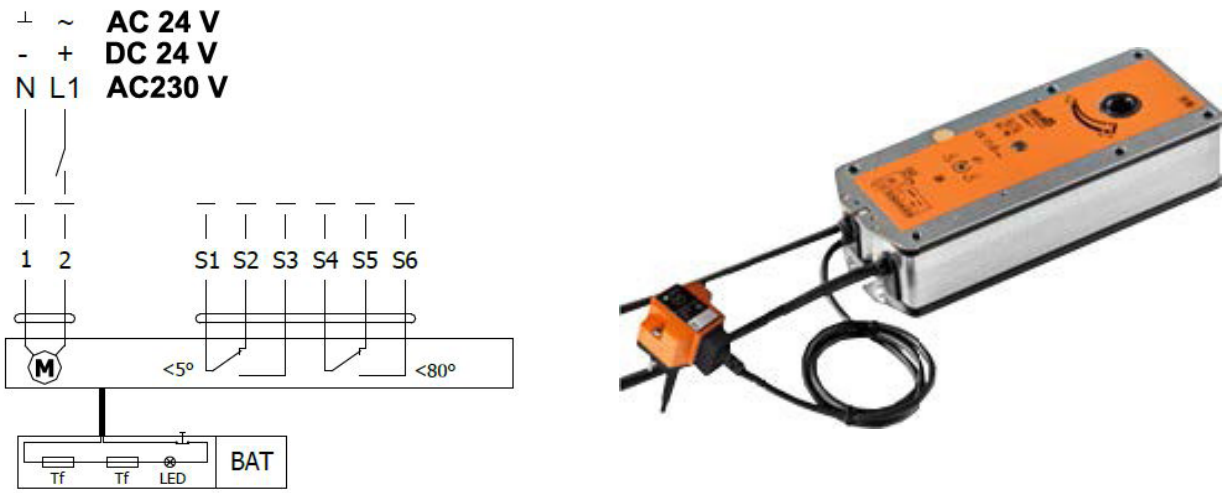
Fig. 10 Actuating mechanism BELIMO BFL,BFN 24-T(-ST)



Tab 2.2.1. Actuating mechanism BELIMO BFL 24-T(-ST), BFN 24-T(-ST), BFL 230-T a BFN 230-T

Actuating mechanism BELIMO	BFL, BFN 230-T	BFL, BFN 24-T(-ST)
Nominal voltage	AC 230 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V
Power consumption - motoring - holding	3,5/5 W 1,1/2,1 W	2,5/4 W 0,8/1,4 W
Dimensioning	6,5/10 VA (Imax 4 A @ 5 ms)	4/6 VA (Imax 8,3 A @ 5 ms)
Protection class	II	III
Degree of protection	IP 54	
Running time - motor - spring return	<60 s ~ 20 s	
Ambient temperature - normal duty - safety duty - non-operating temperature	- 30°C … +55°C The safe position will be attained up to max. +75°C - 40°C … +55°C	
Connecting - motor - auxiliary switch	cable 1 m, 2 x 0,75 mm² (BFL/BFN 24-T-ST) with 3-pin plug-in connectors cable 1 m, 6 x 0,75 mm² (BFL/BFN 24-T-ST) with 6-pin plug-in connectors	
Thermal trips	duct outside temperature +72°C duct inside temperature +72°C	

Fig. 11 Actuating mechanism BELIMO BF 230-TN, BF 24-(ST)



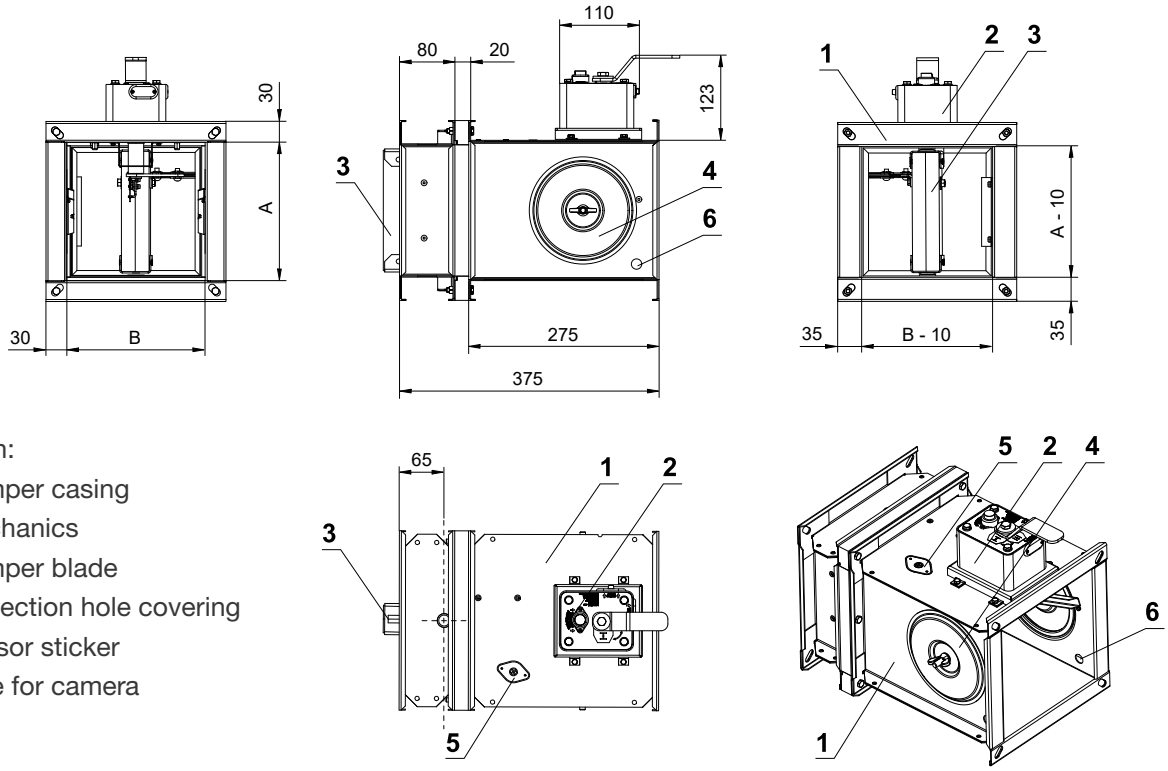
Tab 2.2.2. Actuating mechanism BELIMO BF 24-TN(-ST), BF 230-TN

Actuating mechanism BELIMO	BF 24-TN(-ST)	BF 230-TN
Nominal voltage	AC 24 V 50/60 Hz DC 24 V	AC 230 V 50/60 Hz
Power consumption - motoring - holding	7 W 2 W	8 W 3 W
Dimensioning	10 VA (Imax 8,3 A @ 5 ms)	12,5 VA (Imax 500 mA @ 5 ms)
Protection class	III	II
Degree of protection	IP 54	
Running time - motor - spring return	120 sec ~ 16 sec	
Ambient temperature - normal duty - safety duty - non-operating temperature	- 30°C … +55°C The safe position will be attained up to max. +75°C - 40°C … +55°C	
Connecting - motor - auxiliary switch	cable 1 m, 2 x 0,75 mm^2 cable 1 m, 6 x 0,75 mm^2 (BF 24-T-ST) with plug-in connectors	
Thermal trips	Tf1: duct outside temperature Duct +72°C Tf2/Tf3: duct intside temperature Duct +72°C	

3. Dimensions, weighs and effective area

3.1 Dimensions

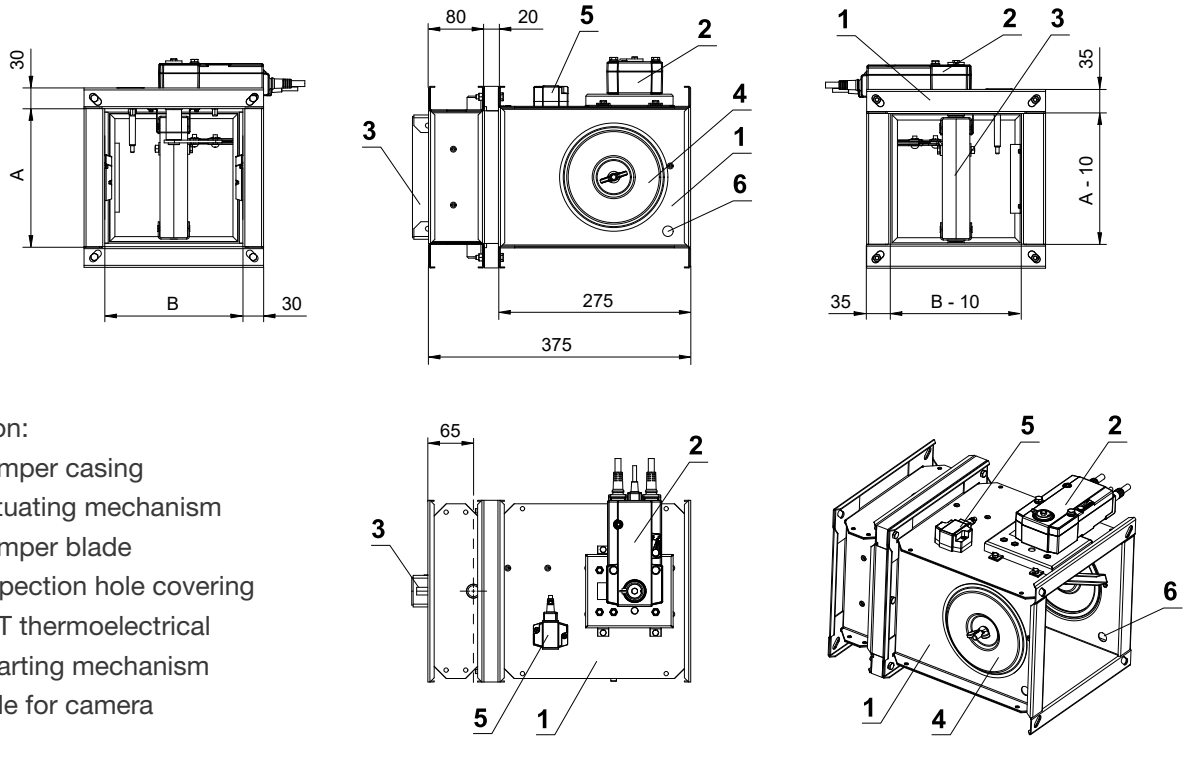
Fig. 12 Design with mechanical control



Position:

1 Damper casing
2 Mechanics
3 Damper blade
4 Inspection hole covering
5 Sensor sticker
6 Hole for camera

Fig. 13 Design with actuating mechanism



Position:

1 Damper casing
2 Actuating mechanism
3 Damper blade
4 Inspection hole covering
5 BAT thermoelectrical starting mechanism
6 Hole for camera

3.2 Dimensions, weights and effective area

Tab 3.2.1. Dimensions, weights and effective area

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
150x150	-	-	8,0	8,1	0,0106	BFL	M1
x180	-	13	8,5	8,6	0,0144	BFL	M1
x200	-	23	8,9	9,0	0,0169	BFL	M1
x225	-	35,5	9,4	9,5	0,0200	BFL	M1
x250	-	48	9,9	10,0	0,0231	BFL	M1
x280	-	63	10,5	10,6	0,0269	BFL	M1
x300	-	73,0	11,1	11,2	0,0294	BFL	M1
x315	-	80,5	11,4	11,5	0,0313	BFL	M1
x355	-	100,5	12,4	12,6	0,0363	BFL	M1
x400	-	123	13,5	13,6	0,0419	BFL	M1
x450	-	148	14,5	14,6	0,0481	BFL	M1
x500	-	173	15,5	15,6	0,0544	BFL	M1
x550	-	198	16,4	16,6	0,0606	BFL	M1
x560	-	203	16,6	16,8	0,0619	BFL	M2
x600	-	223	17,4	17,5	0,0669	BFL	M2
x630	-	238	18,0	18,1	0,0706	BFL	M2
180x150	-	-	8,8	8,9	0,0132	BFL	M1
x180	-	13	9,0	10,5	0,0178	BFL	M1
x200	-	23	9,5	11,0	0,0209	BFL	M1
x225	-	36	10,0	11,5	0,0248	BFL	M1
x250	-	48	10,5	12,0	0,0287	BFL	M1
x280	-	63	11,0	12,5	0,0333	BFL	M1
x300	-	73	11,5	13,0	0,0364	BFL	M1
x315	-	80,5	12,0	13,5	0,0388	BFL	M1
x355	-	100,5	13,0	14,5	0,0450	BFL	M1
x400	-	123	14,0	15,5	0,0519	BFL	M1
x450	-	148	15,0	16,5	0,0597	BFL	M1
x500	-	173	16,0	17,5	0,0674	BFL	M2
x550	-	198	17,0	18,5	0,0752	BFL	M2
x560	-	203	17,0	18,5	0,0767	BFL	M2
x600	-	223	18,0	19,5	0,0829	BFL	M2
x630	-	238	18,5	20,0	0,0876	BFL	M2
x650	3	248	19,0	20,5	0,0907	BFL	M2
x700	28	273	20,0	21,5	0,0984	BFN	M2
x710	33	278	20,0	21,5	0,1000	BFN	M2
x750	53	298	21,0	22,5	0,1062	BFN	M2
x800	78	323	22,0	23,5	0,1139	BFN	M2
250x150	-	-	9,1	9,2	0,0149	BFL	M1
x180	-	13	9,5	11,0	0,0201	BFL	M1
x200	-	23	10,0	11,5	0,0236	BFL	M1
x225	-	36	10,5	13,5	0,0280	BFL	M1
x250	-	48	11,0	12,5	0,0324	BFL	M1
x280	-	63	11,5	14,5	0,0376	BFL	M1
x300	-	73	12,0	13,5	0,0411	BFL	M1
x315	-	80,5	12,5	14,0	0,0438	BFL	M1
x355	-	100,5	13,0	15,0	0,0508	BFL	M1
x400	-	123	14,0	16,0	0,0586	BFL	M1
x450	-	148	15,0	18,0	0,0674	BFL	M1
x500	-	173	16,5	18,0	0,0761	BFL	M2
x550	-	198	17,5	20,5	0,0849	BFL	M2
x560	-	203	17,5	20,5	0,0866	BFL	M2
x600	-	223	18,5	23,0	0,0936	BFL	M2

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x630	-	238	19,0	22,0	0,0989	BFL	M2
x650	3	248	19,5	22,5	0,1024	BFL	M2
250x700	28	273	20,5	25,0	0,1111	BFN	M2
x710	33	278	21,0	24,0	0,1129	BFN	M2
x750	53	298	21,5	24,5	0,1199	BFN	M2
x800	78	323	23,0	26,0	0,1286	BFN	M2
225x150	-	-	9,5	9,7	0,0170	BFL	M1
x180	-	13	10,0	11,5	0,0230	BFL	M1
x200	-	23	10,5	12,0	0,0270	BFL	M1
x225	-	36	11,0	12,5	0,0320	BFL	M1
x250	-	48	11,5	13,0	0,0370	BFL	M1
x280	-	63	12,0	13,5	0,0430	BFL	M1
x300	-	73	12,5	14,0	0,0470	BFL	M1
x315	-	80,5	13,0	14,5	0,0500	BFL	M1
x355	-	100,5	14,0	15,5	0,0580	BFL	M1
x400	-	123	15,0	16,5	0,0670	BFL	M1
x450	-	148	16,0	17,5	0,0770	BFL	M1
x500	-	173	17,0	18,5	0,0870	BFL	M2
x550	-	198	18,0	19,5	0,0970	BFL	M2
x560	-	203	18,0	19,5	0,0990	BFL	M2
x600	-	223	19,0	20,5	0,1070	BFL	M2
x630	-	238	19,5	21,0	0,1130	BFN	M2
x650	3	248	20,0	21,5	0,1170	BFN	M2
x700	28	273	21,0	22,5	0,1270	BFN	M2
x710	33	278	21,0	22,5	0,1290	BFN	M2
x750	53	298	22,0	23,5	0,1370	BFN	M2
x800	78	323	23,0	24,5	0,1470	BFN	M2
250x150	-	-	10,0	10,1	0,0191	BFL	M1
x180	-	13	10,5	12,0	0,0259	BFL	M1
x200	-	23	10,5	12,5	0,0304	BFL	M1
x225	-	36	11,0	13,0	0,0360	BFL	M1
x250	-	48	12,0	13,5	0,0416	BFL	M1
x280	-	63	13,0	14,5	0,0484	BFL	M1
x300	-	73	13,0	15,0	0,0529	BFL	M1
x315	-	80,5	13,5	15,0	0,0563	BFL	M1
x355	-	100,5	14,5	16,0	0,0653	BFL	M1
x400	-	123	15,5	17,0	0,0754	BFL	M1
x450	-	148	16,5	19,5	0,0866	BFL	M1
x500	-	173	18,0	21,0	0,0979	BFL	M2
x550	-	198	19,0	22,0	0,1091	BFL	M2
x560	-	203	19,0	22,0	0,1114	BFL	M2
x600	-	223	20,0	23,0	0,1204	BFN	M2
x630	-	238	21,0	24,0	0,1271	BFN	M2
x650	3	248	21,5	24,5	0,1316	BFN	M2
x700	28	273	22,5	25,5	0,1429	BFN	M2
x710	33	278	23,0	26,0	0,1451	BFN	M2
x750	53	298	23,5	26,5	0,1541	BFN	M3
x800	78	323	25,0	28,0	0,1654	BFN	M3
280x150	-	-	10,5	10,6	0,0217	BFL	M1
x180	-	13	11,0	12,5	0,0293	BFL	M1
x200	-	23	11,5	13,5	0,0344	BFL	M1
x225	-	36	12,0	14,0	0,0408	BFL	M1

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x250	-	48	13,0	14,5	0,0472	BFL	M1
x280	-	63	14,0	15,5	0,0548	BFL	M1
x300	-	73	14,0	16,0	0,0599	BFL	M1
x315	-	80,5	14,5	16,5	0,0638	BFL	M1
280x355	-	100,5	15,5	17,5	0,0740	BFL	M1
x400	-	123	17,0	18,5	0,0854	BFL	M1
x450	-	148	18,0	21,0	0,0982	BFL	M1
x500	-	173	19,5	22,5	0,1109	BFL	M2
x550	-	198	20,5	23,5	0,1237	BFL	M2
x560	-	203	21,0	24,0	0,1262	BFN	M2
x600	-	223	22,0	25,0	0,1364	BFN	M2
x630	-	238	22,5	25,5	0,1441	BFN	M2
x650	3	248	23,0	26,0	0,1492	BFN	M2
x700	28	273	24,5	27,5	0,1619	BFN	M2
x710	33	278	24,5	27,5	0,1645	BFN	M2
x750	53	298	25,5	28,5	0,1747	BFN	M3
x800	78	323	27,0	30,0	0,1874	BFN	M3
300x150	-	-	10,8	11,0	0,0234	BFL	M1
x180	-	13	11,5	13,0	0,0316	BFL	M1
x200	-	23	11,5	13,5	0,0371	BFL	M1
x225	-	36	12,0	14,0	0,0440	BFL	M1
x250	-	48	13,0	14,5	0,0509	BFL	M1
x280	-	63	14,0	15,5	0,0591	BFL	M1
x300	-	73	14,0	16,0	0,0646	BFL	M1
x315	-	80,5	14,5	16,5	0,0688	BFL	M1
x355	-	100,5	15,5	17,5	0,0798	BFL	M1
x400	-	123	17,0	18,5	0,0921	BFL	M1
x450	-	148	18,0	21,0	0,1059	BFL	M1
x500	-	173	19,5	22,5	0,1196	BFL	M2
x550	-	198	20,5	23,5	0,1334	BFN	M2
x560	-	203	21,0	24,0	0,1361	BFN	M2
x600	-	223	22,0	25,0	0,1471	BFN	M2
x630	-	238	22,5	25,5	0,1554	BFN	M2
x650	3	248	23,0	26,0	0,1609	BFN	M2
x700	28	273	24,5	27,5	0,1746	BFN	M2
x710	33	278	24,5	27,5	0,1774	BFN	M2
x750	53	298	25,5	28,5	0,1884	BFN	M3
x800	78	323	27,0	30,0	0,2021	BFN	M3
315x150	-	-	11,8	11,9	0,0281	BFL	M1
x180	-	13	12,0	13,5	0,0334	BFL	M1
x200	-	23	12,0	13,5	0,0392	BFL	M1
x225	-	36	12,5	14,0	0,0464	BFL	M1
x250	-	48	13,5	15,0	0,0537	BFL	M1
x280	-	63	14,5	16,0	0,0624	BFL	M1
x300	-	73	14,5	16,5	0,0682	BFL	M1
x315	-	80,5	15,0	16,5	0,0725	BFL	M1
x355	-	100,5	16,0	17,5	0,0841	BFL	M1
x400	-	123	17,0	19,0	0,0972	BFL	M1
x450	-	148	18,5	21,5	0,1117	BFL	M1
x500	-	173	19,5	22,5	0,1262	BFL	M2
x550	-	198	21,0	24,0	0,1407	BFN	M2
x560	-	203	21,5	24,5	0,1436	BFN	M2
x600	-	223	22,5	25,5	0,1639	BFN	M2
x630	-	238	23,0	26,0	0,1697	BFN	M2

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x650	3	248	23,5	26,5	0,1712	BFN	M2
x700	28	273	25,0	28,0	0,1842	BFN	M2
x710	33	278	25,0	28,0	0,1871	BFN	M2
x750	53	298	26,0	29,0	0,1987	BFN	M3
315x800	78	323	27,5	30,5	0,2132	BFN	M3
355x150	-	-	11,8	11,9	0,0281	BFL	M1
x180	-	13	13,0	14,5	0,0380	BFL	M1
x200	-	23	13,0	14,5	0,0446	BFL	M1
x225	-	36	13,5	15,0	0,0528	BFL	M1
x250	-	48	14,0	16,0	0,0611	BFL	M1
x280	-	63	15,0	17,0	0,0710	BFL	M1
x300	-	73	15,5	17,0	0,0776	BFL	M1
x315	-	80,5	16,0	17,5	0,0825	BFL	M1
x355	-	100,5	17,0	18,5	0,0957	BFL	M1
x400	-	123	18,0	20,0	0,1106	BFL	M1
x450	-	148	19,5	22,5	0,1271	BFL	M1
x500	-	173	21,0	24,0	0,1436	BFN	M2
x550	-	198	22,5	25,5	0,1601	BFN	M2
x560	-	203	22,5	25,5	0,1634	BFN	M2
x600	-	223	23,5	26,5	0,1766	BFN	M2
x630	-	238	24,5	27,5	0,1865	BFN	M2
x650	3	248	25,0	28,0	0,1931	BFN	M2
x700	28	273	26,5	29,5	0,2096	BFN	M2
x710	33	278	26,5	29,0	0,2129	BFN	M2
x750	53	298	27,5	30,5	0,2261	BFN	M3
x800	78	323	29,0	32,0	0,2426	BF	M3
400x150	-	-	12,6	12,7	0,0319	BFL	M1
x180	-	13	13,5	15,5	0,0431	BFL	M1
x200	-	23	14,0	15,5	0,0506	BFL	M1
x225	-	36	14,5	16,5	0,0600	BFL	M1
x250	-	48	15,0	17,0	0,0694	BFL	M1
x280	-	63	16,0	18,0	0,0806	BFL	M1
x300	-	73	16,5	18,0	0,0881	BFL	M1
x315	-	80,5	17,0	18,5	0,0938	BFL	M1
x355	-	100,5	18,0	20,0	0,1088	BFL	M1
x400	-	123	19,5	21,0	0,1256	BFL	M1
x450	-	148	21,0	24,0	0,1444	BFL	M1
x500	-	173	22,5	25,5	0,1631	BFN	M2
x550	-	198	23,5	26,5	0,1819	BFN	M2
x560	-	203	24,0	27,0	0,1856	BFN	M2
x600	-	223	25,5	28,5	0,2006	BFN	M2
x630	-	238	26,0	29,0	0,2119	BFN	M2
x650	3	248	26,5	29,5	0,2194	BFN	M2
x700	28	273	28,0	31,5	0,2381	BFN	M2
x710	33	278	28,5	31,5	0,2419	BFN	M2
x750	53	298	29,5	32,5	0,2569	BF	M3
x800	78	323	31,0	34,0	0,2756	BF	M3
450x150	-	-	13,5	13,6	0,0361	BFL	M1
x180	-	13	14,5	16,5	0,0489	BFL	M1
x200	-	23	15,0	16,5	0,0574	BFL	M1
x225	-	36	15,5	17,5	0,0680	BFL	M1
x250	-	48	16,0	18,0	0,0786	BFL	M1
x280	-	63	17,0	19,0	0,0914	BFL	M1
x300	-	73	17,5	19,5	0,0999	BFL	M1

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x315	-	80,5	18,0	20,0	0,1063	BFL	M1
x355	-	100,5	19,5	21,0	0,1233	BFL	M1
x400	-	123	20,5	22,5	0,1424	BFL	M1
x450	-	148	22,0	25,0	0,1636	BFN	M2
x500	-	173	24,0	27,0	0,1849	BFN	M2
x550	-	198	25,5	28,5	0,2061	BFN	M2
x560	-	203	25,5	28,5	0,2104	BFN	M2
x600	-	223	27,0	30,0	0,2274	BFN	M2
x630	-	238	27,5	30,5	0,2401	BFN	M2
x650	3	248	28,5	31,5	0,2486	BFN	M2
x700	28	273	30,0	33,0	0,2699	BF	M2
x710	33	278	30,0	33,0	0,2741	BF	M2
x750	53	298	31,5	34,5	0,2911	BF	M3
x800	78	323	33,0	36,0	0,3124	BF	M3
500x150	-	-	14,3	14,5	0,0404	BFL	M1
x180	-	13	15,5	17,0	0,0546	BFL	M1
x200	-	23	16,0	17,5	0,0641	BFL	M1
x225	-	36	16,5	18,0	0,0760	BFL	M1
x250	-	48	17,0	19,0	0,0879	BFL	M1
x280	-	63	18,0	20,0	0,1021	BFL	M1
x300	-	73	19,0	20,5	0,1116	BFL	M1
x315	-	80,5	19,5	21,0	0,1188	BFL	M1
x355	-	100,5	20,5	22,5	0,1378	BFL	M1
x400	-	123	22,0	23,5	0,1591	BFL	M2
x450	-	148	23,5	26,5	0,1829	BFN	M2
x500	-	173	25,5	28,5	0,2066	BFN	M2
x550	-	198	27,0	30,0	0,2304	BFN	M2
x560	-	203	27,0	30,0	0,2351	BFN	M2
x600	-	223	28,5	31,5	0,2541	BFN	M2
x630	-	238	29,5	32,5	0,2684	BFN	M2
x650	3	248	30,0	33,0	0,2779	BF	M2
x700	28	273	32,0	35,0	0,3016	BF	M2
x710	33	278	32,0	35,0	0,3064	BF	M2
x750	53	298	33,5	36,5	0,3254	BF	M3
x800	78	323	35,0	38,0	0,3491	BF	M3
550x150	-	-	15,2	15,3	0,0446	BFL	M1
x180	-	13	16,5	18,0	0,0604	BFL	M1
x200	-	23	17,0	18,5	0,0709	BFL	M1
x225	-	36	17,5	19,0	0,0840	BFL	M1
x250	-	48	18,0	20,0	0,0971	BFL	M1
x280	-	63	19,0	21,0	0,1129	BFL	M1
x300	-	73	20,0	21,5	0,1234	BFL	M1
x315	-	80,5	20,5	22,0	0,1313	BFL	M1
x355	-	100,5	22,0	23,5	0,1523	BFL	M1
x400	-	123	23,5	25,0	0,1759	BFN	M2
x450	-	148	25,0	28,0	0,2021	BFN	M2
x500	-	173	27,0	30,0	0,2284	BFN	M2
x550	-	198	28,5	31,5	0,2546	BFN	M2
x560	-	203	29,0	32,0	0,2599	BFN	M2
x600	-	223	30,5	33,5	0,2809	BFN	M2
x630	-	238	31,0	34,0	0,2966	BF	M2
x650	3	248	32,0	35,0	0,3071	BF	M2
x700	28	273	34,0	37,0	0,3334	BF	M2
x710	33	278	34,0	37,0	0,3386	BF	M2

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x750	53	298	35,5	38,5	0,3596	BF	M3
x800	78	323	37,0	40,0	0,3859	BF	M3
560x150	-	-	15,4	15,5	0,0455	BFL	M1
x180	-	13	16,5	18,5	0,0615	BFL	M1
x200	-	23	17,0	18,5	0,0722	BFL	M1
x225	-	36	17,5	19,5	0,0856	BFL	M1
x250	-	48	18,5	20,0	0,0990	BFL	M1
x280	-	63	19,5	21,0	0,1150	BFL	M1
x300	-	73	20,0	22,0	0,1257	BFL	M1
x315	-	80,5	20,5	22,5	0,1338	BFL	M1
x355	-	100,5	22,0	23,5	0,1552	BFL	M1
x400	-	123	23,5	25,5	0,1792	BFN	M2
x450	-	148	25,5	28,5	0,2060	BFN	M2
x500	-	173	27,0	30,0	0,2327	BFN	M2
x550	-	198	29,0	32,0	0,2595	BFN	M2
x560	-	203	29,5	32,5	0,2648	BFN	M2
x600	-	223	31,0	34,0	0,2862	BFN	M2
x630	-	238	31,5	34,5	0,3023	BF	M2
x650	3	248	32,0	35,0	0,3130	BF	M2
x700	28	273	34,0	37,0	0,3397	BF	M2
x710	33	278	34,5	37,5	0,3451	BF	M2
x750	53	298	35,5	38,5	0,3665	BF	M3
x800	78	323	37,5	40,5	0,3932	BF	M3
600x150	-	-	16,1	16,2	0,0489	BFL	M1
x180	-	13	17,5	19,5	0,0661	BFL	M1
x200	-	23	18,0	20,5	0,0776	BFL	M1
x225	-	36	18,5	21,5	0,0920	BFL	M1
x250	-	48	19,0	22,0	0,1064	BFL	M1
x280	-	63	20,0	23,0	0,1236	BFL	M1
x300	-	73	21,0	24,0	0,1351	BFL	M1
x315	-	80,5	21,5	24,5	0,1438	BFL	M1
x355	-	100,5	23,0	26,0	0,1668	BFL	M2
x400	-	123	24,5	27,5	0,1926	BFN	M2
x450	-	148	26,5	29,5	0,2214	BFN	M2
x500	-	173	28,5	31,5	0,2501	BFN	M2
x550	-	198	30,0	33,0	0,2789	BFN	M2
x560	-	203	30,5	33,5	0,2846	BFN	M2
x600	-	223	32,0	35,0	0,3076	BF	M2
x630	-	238	33,0	36,0	0,3249	BF	M2
x650	3	248	33,5	36,5	0,3364	BF	M2
x700	28	273	35,5	38,5	0,3651	BF	M2
x710	33	278	36,0	39,0	0,3709	BF	M2
x750	53	298	37,5	40,5	0,3939	BF	M3
x800	78	323	39,0	42,0	0,4226	BF	M3
630x150	-	-	16,6	16,7	0,0514	BFL	M1
x180	-	13	18,0	20,0	0,0696	BFL	M1
x200	-	23	18,5	21,0	0,0817	BFL	M1
x225	-	36	19,0	22,0	0,0968	BFL	M1
x250	-	48	20,0	23,0	0,1119	BFL	M1
x280	-	63	21,0	24,0	0,1301	BFL	M1
x300	-	73	21,5	24,5	0,1422	BFL	M1
x315	-	80,5	22,5	25,5	0,1513	BFL	M1
x355	-	100,5	24,0	27,0	0,1755	BFL	M2
x400	-	123	25,5	28,5	0,2027	BFN	M2

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x450	-	148	27,5	30,5	0,2329	BFN	M2
x500	-	173	29,0	32,0	0,2632	BFN	M2
x550	-	198	31,0	34,0	0,2934	BFN	M2
x560	-	203	31,5	34,5	0,2995	BFN	M2
x600	-	223	33,0	36,0	0,3237	BF	M2
x630	-	238	34,0	37,0	0,3418	BF	M2
x650	3	248	34,5	37,5	0,3539	BF	M2
x700	28	273	36,5	39,5	0,3842	BF	M2
x710	33	278	37,0	40,0	0,3902	BF	M2
x750	53	298	38,5	41,5	0,4144	BF	M3
x800	78	323	40,5	43,5	0,4447	BF	M4
650x150	-	-	17,0	17,1	0,0531	BFL	M1
x180	-	13	19,0	20,5	0,0719	BFL	M1
x200	-	23	20,0	21,5	0,0844	BFL	M1
x225	-	36	21,0	22,5	0,1000	BFL	M1
x250	-	48	22,0	23,5	0,1156	BFL	M1
x280	-	63	23,0	24,5	0,1344	BFL	M1
x300	-	73	24,0	25,5	0,1469	BFL	M1
x315	-	80,5	24,5	26,0	0,1563	BFL	M2
x355	-	100,5	26,0	27,5	0,1813	BFL	M2
x400	-	123	28,0	29,5	0,2094	BFN	M2
x450	-	148	30,0	31,5	0,2406	BFN	M2
x500	-	173	32,0	33,5	0,2719	BFN	M2
x550	-	198	34,0	35,5	0,3031	BFN	M2
x560	-	203	34,5	37,5	0,3094	BF	M2
x600	-	223	36,0	39,0	0,3344	BF	M2
x630	-	238	37,0	40,0	0,3531	BF	M2
x650	3	248	38,0	41,0	0,3656	BF	M2
x700	28	273	40,0	43,0	0,3969	BF	M2
x710	33	278	40,5	43,5	0,4031	BF	M2
x750	53	298	42,0	45,0	0,4281	BF	M3
x800	78	323	44,0	47,0	0,4594	BF	M4
700x150	-	-	17,8	18,0	0,0574	BFL	M1
x180	-	13	20,0	21,5	0,0776	BFL	M1
x200	-	23	21,0	22,5	0,0911	BFL	M1
x225	-	36	22,0	23,5	0,1080	BFL	M1
x250	-	48	23,0	24,5	0,1249	BFL	M1
x280	-	63	24,5	26,0	0,1451	BFL	M1
x300	-	73	25,5	27,0	0,1586	BFL	M2
x315	-	80,5	26,0	27,5	0,1688	BFL	M2
x355	-	100,5	27,5	29,0	0,1958	BFN	M2
x400	-	123	29,5	31,0	0,2261	BFN	M2
x450	-	148	31,5	33,0	0,2599	BFN	M2
x500	-	173	33,5	35,0	0,2936	BFN	M2
x550	-	198	35,5	38,5	0,3274	BF	M2
x560	-	203	36,0	39,0	0,3341	BF	M2
x600	-	223	37,5	40,5	0,3611	BF	M2
x630	-	238	39,0	42,0	0,3814	BF	M2
x650	3	248	40,0	43,0	0,3949	BF	M2
x700	28	273	42,0	45,0	0,4286	BF	M2
x710	33	278	42,5	45,5	0,4354	BF	M2
x750	53	298	44,0	47,0	0,4624	BF	M3
x800	78	323	46,0	49,0	0,4961	BF	M4
710x150	-	-	18,0	18,1	0,0582	BFL	M1

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x180	-	13	20,0	21,5	0,0788	BFL	M1
x200	-	23	21,0	22,5	0,0925	BFL	M1
x225	-	36	21,5	23,5	0,1096	BFL	M1
x250	-	48	22,0	24,5	0,1267	BFL	M1
x280	-	63	23,0	26,0	0,1473	BFL	M1
x300	-	73	23,5	26,5	0,1610	BFL	M2
x315	-	80,5	24,0	27,0	0,1713	BFL	M2
x355	-	100,5	25,5	28,5	0,1987	BFN	M2
x400	-	123	27,5	30,5	0,2295	BFN	M2
x450	-	148	29,5	32,5	0,2637	BFN	M2
x500	-	173	31,5	34,5	0,2980	BFN	M2
x550	-	198	33,5	36,5	0,3322	BF	M2
x560	-	203	34,0	37,0	0,3391	BF	M2
x600	-	223	35,5	38,5	0,3665	BF	M2
x630	-	238	36,5	39,5	0,3870	BF	M2
x650	3	248	37,5	40,5	0,4007	BF	M2
x700	28	273	39,5	42,5	0,4350	BF	M2
x710	33	278	40,0	43,0	0,4418	BF	M3
x750	53	298	41,5	44,5	0,4692	BF	M3
x800	78	323	43,5	46,5	0,5035	BF	M4
750x150	-	-	18,7	18,8	0,0616	BFL	M1
x180	-	13	21,0	22,5	0,0834	BFL	M1
x200	-	23	22,0	23,5	0,0979	BFL	M1
x225	-	36	22,5	24,5	0,1160	BFL	M1
x250	-	48	23,0	25,5	0,1341	BFL	M1
x280	-	63	24,0	27,0	0,1559	BFL	M2
x300	-	73	24,5	27,5	0,1704	BFL	M2
x315	-	80,5	25,0	28,0	0,1813	BFL	M2
x355	-	100,5	26,5	29,5	0,2103	BFN	M2
x400	-	123	28,5	31,5	0,2429	BFN	M2
x450	-	148	30,5	33,5	0,2791	BFN	M2
x500	-	173	32,5	35,5	0,3154	BFN	M2
x550	-	198	35,0	38,0	0,3516	BF	M2
x560	-	203	35,0	38,5	0,3589	BF	M2
x600	-	223	37,0	40,5	0,3879	BF	M2
x630	-	238	38,0	41,0	0,4096	BF	M2
x650	3	248	39,0	42,0	0,4241	BF	M2
x700	28	273	41,5	44,5	0,4604	BF	M3
x710	33	278	41,5	44,5	0,4676	BF	M3
x750	53	298	43,0	46,0	0,4966	BF	M3
x800	78	323	45,0	48,0	0,5329	BF	M4
800x150	-	-	19,6	19,7	0,0659	BFL	M1
x180	-	13	22,0	23,5	0,0891	BFL	M1
x200	-	23	23,0	24,5	0,1046	BFL	M1
x225	-	36	23,5	25,5	0,1240	BFL	M1
x250	-	48	24,0	26,5	0,1434	BFL	M2
x280	-	63	25,0	28,0	0,1666	BFL	M2
x300	-	73	25,5	28,5	0,1821	BFL	M2
x315	-	80,5	26,5	29,5	0,1938	BFL	M2
x355	-	100,5	28,0	31,0	0,2248	BFN	M2
x400	-	123	30,0	33,0	0,2596	BFN	M2
x450	-	148	32,0	35,0	0,2984	BFN	M2
x500	-	173	34,0	37,0	0,3371	BFN	M2
x550	-	198	36,5	39,5	0,3759	BF	M2

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x560	-	203	37,0	40,0	0,3836	BF	M2
x600	-	223	39,0	42,0	0,4146	BF	M2
x630	-	238	40,0	43,0	0,4379	BF	M3
x650	3	248	40,5	43,5	0,4534	BF	M3
x700	28	273	43,0	46,0	0,4921	BF	M3
x710	33	278	43,5	46,5	0,4999	BF	M3
x750	53	298	45,0	48,0	0,5309	BF	M3
x800	78	323	47,0	50,0	0,5696	BF	M4
900x150	-	-	21,3	21,5	0,0744	BFL	M1
x180	-	13	24,0	25,5	0,1006	BFL	M1
x200	-	23	25,0	26,5	0,1181	BFL	M1
x225	-	36	26,5	28,0	0,1400	BFL	M2
x250	-	48	28,0	29,5	0,1619	BFL	M2
x280	-	63	29,5	31,0	0,1881	BFL	M2
x300	-	73	30,0	31,5	0,2056	BFL	M2
x315	-	80,5	30,5	32,0	0,2188	BFN	M2
x355	-	100,5	31,0	33,5	0,2538	BFN	M2
x400	-	123	32,5	35,5	0,2931	BFN	M2
x450	-	148	35,0	38,0	0,3369	BFN	M2
x500	-	173	37,0	40,0	0,3806	BF	M2
x550	-	198	39,5	42,5	0,4244	BF	M2
x560	-	203	40,0	43,0	0,4331	BF	M3
x600	-	223	42,0	45,0	0,4681	BF	M3
x630	-	238	43,5	46,5	0,4944	BF	M3
x650	3	248	44,5	47,5	0,5119	BF	M3
x700	28	273	47,0	50,0	0,5556	BF	M3
x710	33	278	47,0	50,0	0,5644	BF	M3
x750	53	298	49,0	52,0	0,5994	BF	M3
x800	78	323	51,5	54,5	0,6431	BF	M4
1000x150	-	-	23,1	23,2	0,0829	BFL	M1
x180	-	13	26,0	27,5	0,1121	BFL	M1
x200	-	23	27,0	28,5	0,1316	BFL	M2
x225	-	36	28,5	30,0	0,1560	BFL	M2
x250	-	48	30,0	31,5	0,1804	BFL	M2
x280	-	63	31,5	33,0	0,2096	BFL	M2
x300	-	73	32,5	34,0	0,2291	BFN	M2
x315	-	80,5	33,5	35,0	0,2438	BFN	M2
x355	-	100,5	35,5	37,0	0,2828	BFN	M2
x400	-	123	35,0	38,0	0,3266	BFN	M2
x450	-	148	37,5	40,5	0,3754	BFN	M2
x500	-	173	40,0	43,0	0,4241	BF	M2
x550	-	198	42,5	45,5	0,4729	BF	M3
x560	-	203	43,0	46,0	0,4826	BF	M3
x600	-	223	45,0	48,0	0,5216	BF	M3
x630	-	238	47,0	50,0	0,5509	BF	M3
x650	3	248	48,0	51,0	0,5704	BF	M3
x700	28	273	51,0	54,0	0,6191	BF	M3
x710	33	278	51,0	54,0	0,6289	BF	M3
x750	53	298	53,0	56,0	0,6679	BF	M3
x800	78	323	55,5	58,5	0,7166	BF	M4
1100x180	-	13	28,0	29,5	0,1236	BFL	M1
x200	-	23	29,0	30,5	0,1451	BFL	M2
x225	-	36	30,5	32,0	0,1720	BFL	M2
x250	-	48	32,0	33,5	0,1989	BFL	M2

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x280	-	63	34,0	35,5	0,2311	BFL	M2
x300	-	73	35,0	36,5	0,2526	BFN	M2
x315	-	80,5	36,0	37,5	0,2688	BFN	M2
x355	-	100,5	38,0	40,0	0,3118	BFN	M2
x400	-	123	38,5	41,0	0,3601	BFN	M2
x450	-	148	40,5	43,5	0,4139	BF	M2
x500	-	173	43,0	46,0	0,4676	BF	M3
x550	-	198	46,0	49,0	0,5214	BF	M3
x560	-	203	46,5	49,5	0,5321	BF	M3
x600	-	223	49,0	52,0	0,5751	BF	M3
x630	-	238	50,0	53,0	0,6074	BF	M3
x650	3	248	51,5	54,5	0,6289	BF	M3
x700	28	273	54,5	57,5	0,6826	BF	M3
x710	33	278	54,5	57,5	0,6934	BF	M3
x750	53	298	56,5	59,5	0,7364	BF	M3
x800	78	323	59,5	62,5	0,7901	BF	M4
1250x180	-	13	31,0	32,5	0,1409	BFL	M2
x200	-	23	32,5	34,0	0,1654	BFL	M2
x225	-	36	34,0	35,5	0,1960	BFL	M2
x250	-	48	35,5	37,0	0,2266	BFL	M2
x280	-	63	37,5	39,0	0,2634	BFN	M2
x300	-	73	39,0	40,5	0,2879	BFN	M2
x315	-	80,5	40,0	41,5	0,3063	BFN	M2
x355	-	100,5	42,5	45,5	0,3553	BFN	M2
x400	-	123	45,5	48,5	0,4104	BFN	M2
x450	-	148	49,0	52,0	0,4716	BF	M3
x500	-	173	47,5	50,5	0,5329	BF	M3
x550	-	198	50,5	53,5	0,5941	BF	M3
x560	-	203	51,5	54,5	0,6064	BF	M3
x600	-	223	54,0	57,0	0,6554	BF	M3
x630	-	238	55,5	58,5	0,6921	BF	M3
x650	3	248	56,5	59,5	0,7166	BF	M3
x700	28	273	60,0	63,0	0,7779	BF	M4
x710	33	278	60,0	63,0	0,7901	BF	M4
x750	53	298	62,5	65,5	0,8391	BF	M5
x800	78	323	65,5	68,5	0,9004	BF	M5
1400x180	-	13	34,0	35,5	0,1581	BFL	M2
x200	-	23	35,5	37,0	0,1856	BFL	M2
x225	-	36	37,5	39,0	0,2200	BFL	M2
x250	-	48	39,5	41,0	0,2544	BFN	M2
x280	-	63	41,5	43,0	0,2956	BFN	M2
x300	-	73	43,0	44,5	0,3231	BFN	M2
x315	-	80,5	44,0	47,0	0,3438	BFN	M2
x355	-	100,5	47,0	50,0	0,3988	BFN	M2
x400	-	123	50,0	53,0	0,4606	BF	M3
x450	-	148	53,5	56,5	0,5294	BF	M3
x500	-	173	52,0	55,0	0,5981	BF	M3
x550	-	198	55,5	58,5	0,6669	BF	M3
x560	-	203	56,0	59,0	0,6806	BF	M3
x600	-	223	59,0	62,0	0,7356	BF	M3
x630	-	238	60,5	63,5	0,7769	BF	M4
x650	3	248	62,0	65,0	0,8044	BF	M5
x700	28	273	65,5	68,5	0,8731	BF	M5
x710	33	278	66,0	69,0	0,8869	BF	M5

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x750	53	298	68,5	71,5	0,9419	BF	M5
x800	78	323	71,5	74,5	1,0106	BF	M5
1500x180	-	13	36,0	37,5	0,1696	BFL	M2
x200	-	23	37,5	39,0	0,1991	BFL	M2
1500x225	-	36	39,5	41,0	0,2360	BFL	M2
x250	-	48	41,5	43,0	0,2729	BFN	M2
x280	-	63	44,0	45,5	0,3171	BFN	M2
x300	-	73	45,5	48,5	0,3466	BFN	M2
x315	-	80,5	46,5	49,5	0,3688	BFN	M2
x355	-	100,5	49,5	52,5	0,4278	BFN	M3
x400	-	123	53,0	56,0	0,4941	BF	M3
x450	-	148	55,0	58,0	0,5679	BF	M3

AxB	a	c	Kaal		Vaba pind (m^2)	Ajami tüüp	Mehh. kontr.
			Manu-aalne	Ajamiga			
x500	-	173	57,0	60,0	0,6416	BF	M3
x550	-	198	58,5	61,5	0,7154	BF	M3
1500x560	-	203	59,5	62,5	0,7301	BF	M3
x600	-	223	62,5	65,5	0,7891	BF	M4
x630	-	238	64,0	67,0	0,8334	BF	M5
x650	3	248	65,5	68,5	0,8629	BF	M5
x700	28	273	69,5	72,5	0,9366	BF	M5
x710	33	278	69,5	79,5	0,9514	BF	M5
x750	53	298	72,5	75,5	1,0104	BF	M5
x800	78	323	75,5	78,5	1,0841	BF	M5

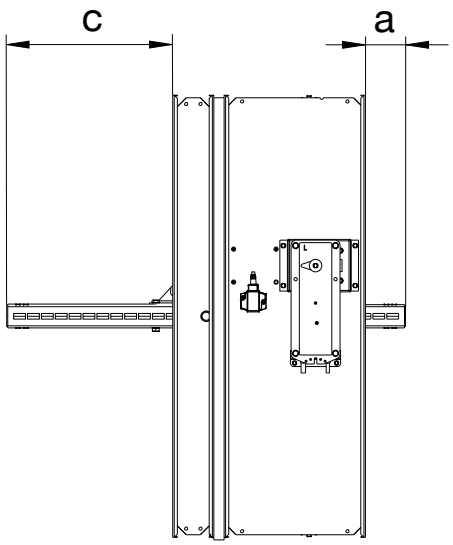
3.3 Blades overlaps

Tab 3.3.1. Blades overlaps

Blades overlaps		Dimension	Overlaps
DAMPER OVERLAPS Fig.28	Act. mechanism side	”a”	Tab. 4.2.1
	Side without act. mechanism	”c”	Tab. 4.2.1

These values have to respected when projecting related air-conditioning ducts

Fig. 14 Damper overlaps



3.4 Dampers can be supplied on the customer´s demands in all subdimension of the above mentioned range.

3.5 Flanges of rectangular fire dampers are 30 mm wide with oval hole

Fig. 15 Flange of Damper- OPERATORS SIDE

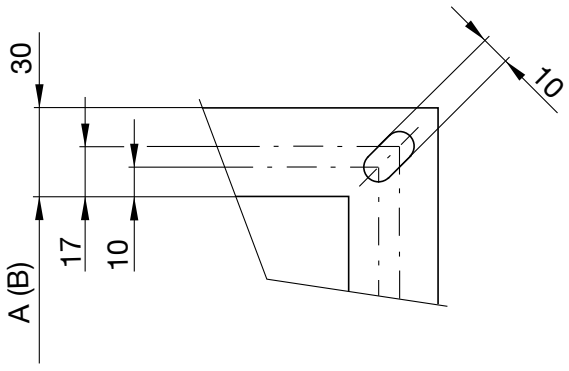
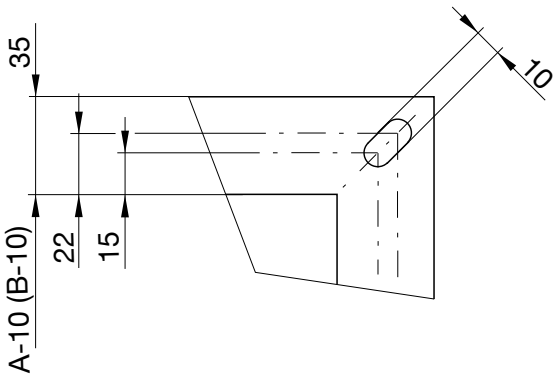


Fig. 16 Flange of Damper- INSTALLATIONS SIDE



4. Placement and Assembly

4.1 Fire dampers are suitable for installation in arbitrary position in vertical and horizontal passages of fire separating structures. The damper assembly procedures must be done so that all load transfer from the fire separating constructions to the damper body is absolutely excluded.

The back-to-back air-conditioning piping must be suspended or supported so that all load transfer from the back-to-back piping to the damper flanges is absolutely excluded. The gap between the installed damper and the building structure must be perfectly filled with approved material all over its volume.

To provide the necessary space for access to the control device, all other items must be situated at least 350 mm from the control parts of the damper. At least one inspection hole must be accessible.

The damper must be installed so that the damper blade (in closed position) is situated in the fire separating structure - marked by the label BUILD-IN EDGE on the damper body. If such solution is not possible, the piping between the fire separating structure and the damper blade must be protected according to the certified installation method, see Section 6.

During the installation and plastering process, the control mechanism must be protected (covered) against damage and pollution. The damper body should not be deformed during bricking in. Once the damper is built in, the damper blade should not grind on the damper body during opening or closing.

The distance between the fire damper and the structure (wall, ceiling) must be 75 mm at the minimum. If two or more dampers are to be installed in one fire separating structure, the distance between adjacent dampers must be 200 mm at the minimum, according to EN 1366-2 paragraph 13.5. For admissible exceptions see Section 6.

Fig. 17 The distance between the fire damper and the construction

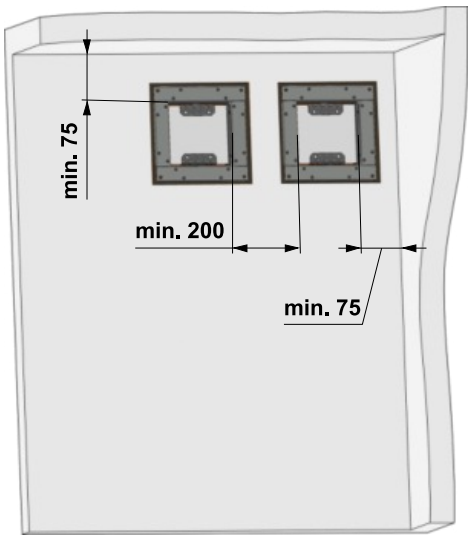
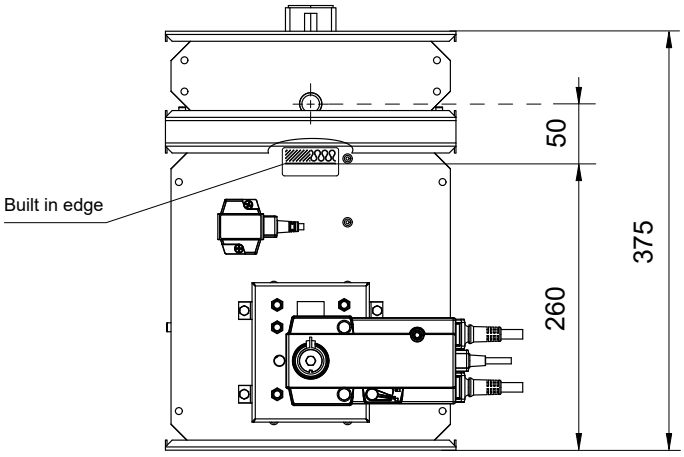


Fig. 18 Built in edge

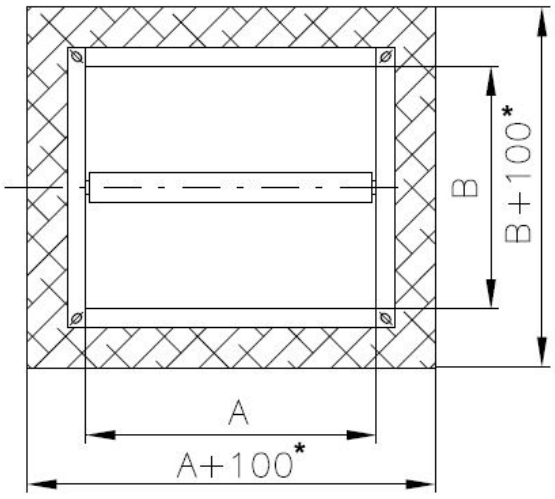


"Wall edge sticker" indicates the recommended edge of installation of fire damper into the fire partition structure (wall). The damper must be installed so that the entire damper blade - in the closed position - is located inside the fire separating structure (wall) and at the same time the control mechanism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

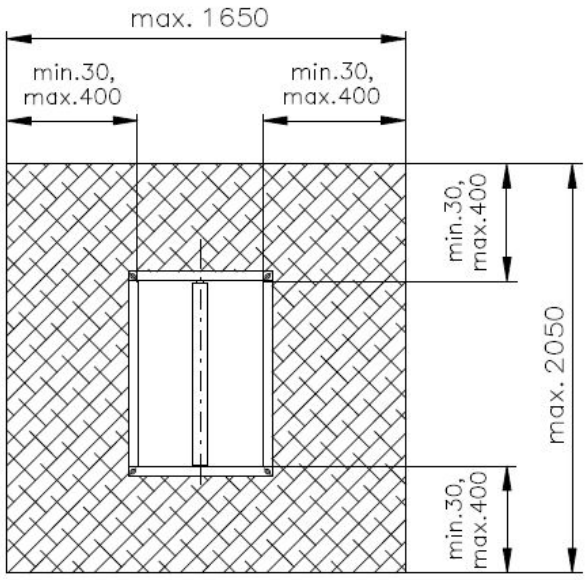
4.2 Installation opening dimensions

Fig. 19 Installation opening dimensions

Installation opening



Installation opening-Weichschott system



* The recommended dimension of the installation opening is from 25 mm to 50 mm on the both sides (it means from A+50 to A+100 or B+50 to B+100)

4.3 Examples of fire damper installing

The fire damper can be integrated into a solid wall construction made e.g. of normal concrete/ masonry, porous concrete with minimum thickness 100 mm or into solid ceiling construction made e.g. of normal concrete with minimum thickness 110 mm or porous concrete with minimum thickness 125 mm. The fire damper can be integrated into a gypsum wall construction with fire classification EI 120 or EI 90.
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.
If is damper installed outside a construction it is necessary to use reinforcement VRM.

5. Statement of installations

5.1 Installation method list

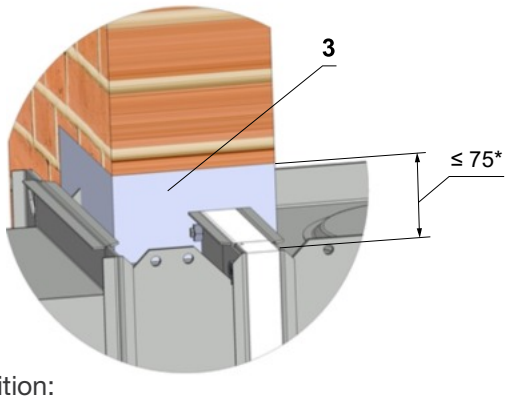
Tab 5.1.1. Installation method list

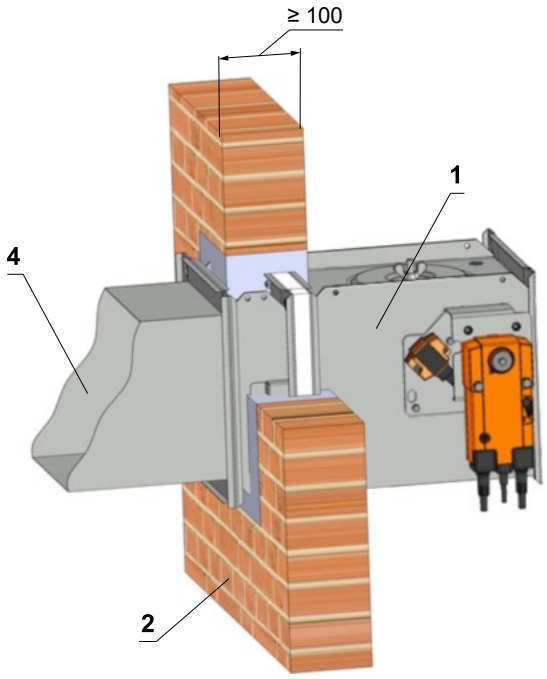
Fire separating constru.	Wall/Ceiling Min.thickness [mm]	Installation	Fire resist.	Page
Solid wall construction	100	Mortar or gypsum	EIS 120 EIS 90	19
	100	Fire protection foam with stucco plaster	EIS 60 EIS 45 EIS 30	19
	100	Battery - mortar or gypsum	EIS 90	20
	100	Installation next to wall - mortar or gypsum and mineral wool	EIS 90	21
	100	Stuffing box with fire protection mastic and cement lime plate	EIS 90	22
	100	Weichschott	EIS 90	23
Outside solid wall construction	100	Mineral wool - mortar or gypsum	EIS 60	24
	100	Mineral wool - stuffing box, fire protection mastic and cement plate	EIS 60	25
	100	Mineral wool - stuffing box and fire protection mastic	EIS 90	26
Gypsum wall construction	100	Mortar or gypsum	EIS 120 EIS 90	27
	100	Fire protection foam with stucco plaster	EIS 60 EIS 45 EIS 30	28
	100	Battery - mortar or gypsum	EIS 90	29
	100	Installation next to wall - mortar or gypsum and mineral wool	EIS 90	30
	100	Stuffing box with fire protection mastic and cement lime plate	EIS 90	31
	100	Weichschott	EIS 90	32
Outside gypsum wall construction	100	Mineral wool - mortar or gypsum	EIS 60	33
	100	Mineral wool - stuffing box and fire protection mastic	EIS 60	34
	100	Mineral wool, stuffing box, fire protection mastic and cement lime plate	EIS 90	35
Solid ceiling construction	110 - Concrete 125 - Aerated concrete	Mortar or gypsum	EIS 60	36
		Battery - mortar or gypsum	EIS 90	37
		Stuffing box with fire protection mastic and cement lime plate	EIS 90	38
		Weichschott	EIS 90	39
Outside solid ceiling construction	110 - Concrete 125 - Aerated concrete	Mineral wool - mortar or gypsum	EIS 90	40
		Concrete	EIS 90	41

5.2 Installation in solid wall construction

Fig. 20 Solid wall construction- mortar or gypsum

EIS 120
EIS 90



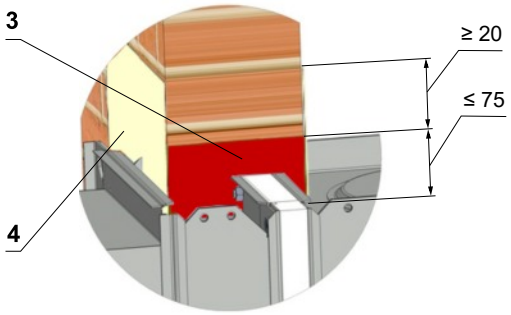


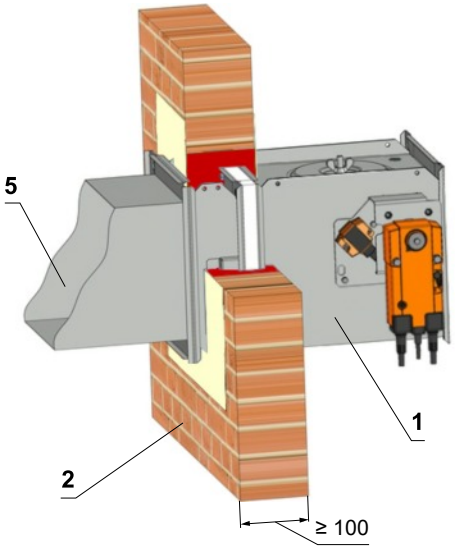
Position:
1 Fire damper
2 Solid wall construction
3 Mortar or gypsum
4 Duct

Shown schemes of incorporation and damper are illustrative only!

Fig. 21 Solid wall construction- fire protection foam with stucco plaster

EIS 60
EIS 45
EIS 30





Position:
1 Fire damper
2 Solid wall constructior
3 Fire protection foam
4 Stucco plaster
5 Duct

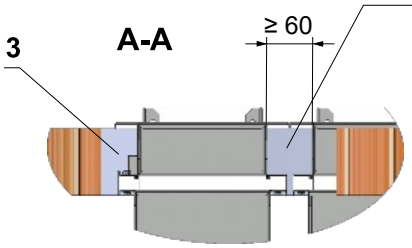
Used materials - example:*
3 HILTI CFS-F FX - EIS 60
PROMAFOAM-C - EIS 45
SOUDAL, Soudafoam FR-B1 - EIS 30
DenBraven, Fire protection foam - EIS 30

The damper must be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

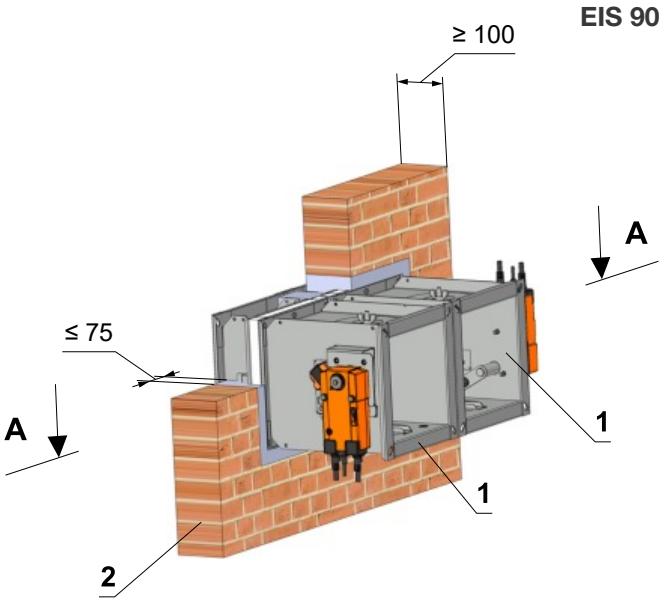
Fig. 22 Solid wall construction- battery- mortar or gypsum

EIS 90

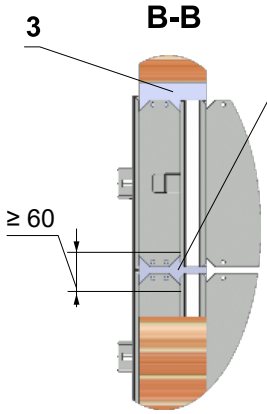
The gap 67 mm between dampers can be filled by mineral stone wool min. density 140 kg/m^3. Wool is fixed to damper body by fire protection mastic.

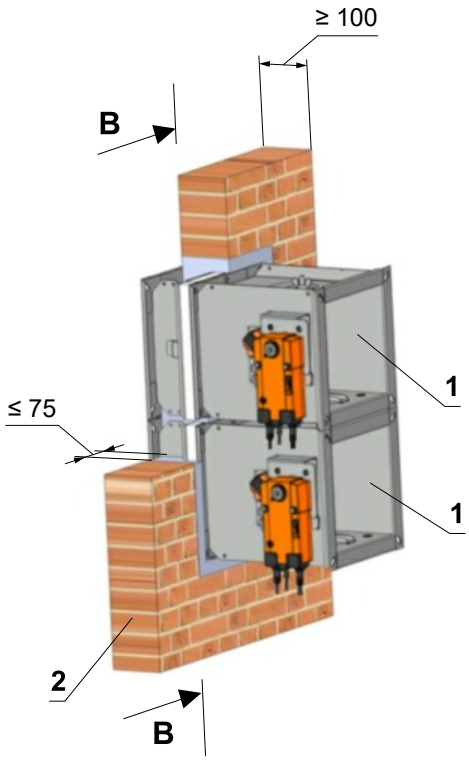


EIS 90



The gap 67 mm between dampers can be filled by mineral stone wool min. density 140 kg/m^3. Wool is fixed to damper body by fire protection mastic.





Position:

1. Fire damper
2. Solid wall construction
3. Mortar or gypsum

Notice:

Installation opening for each damper has minimal dimensions

a x b = (A+100) x (2xB +100) mm or (2xA+100) x (B +100) mm

Gap between damper and construction is filled by mortar or gypsum

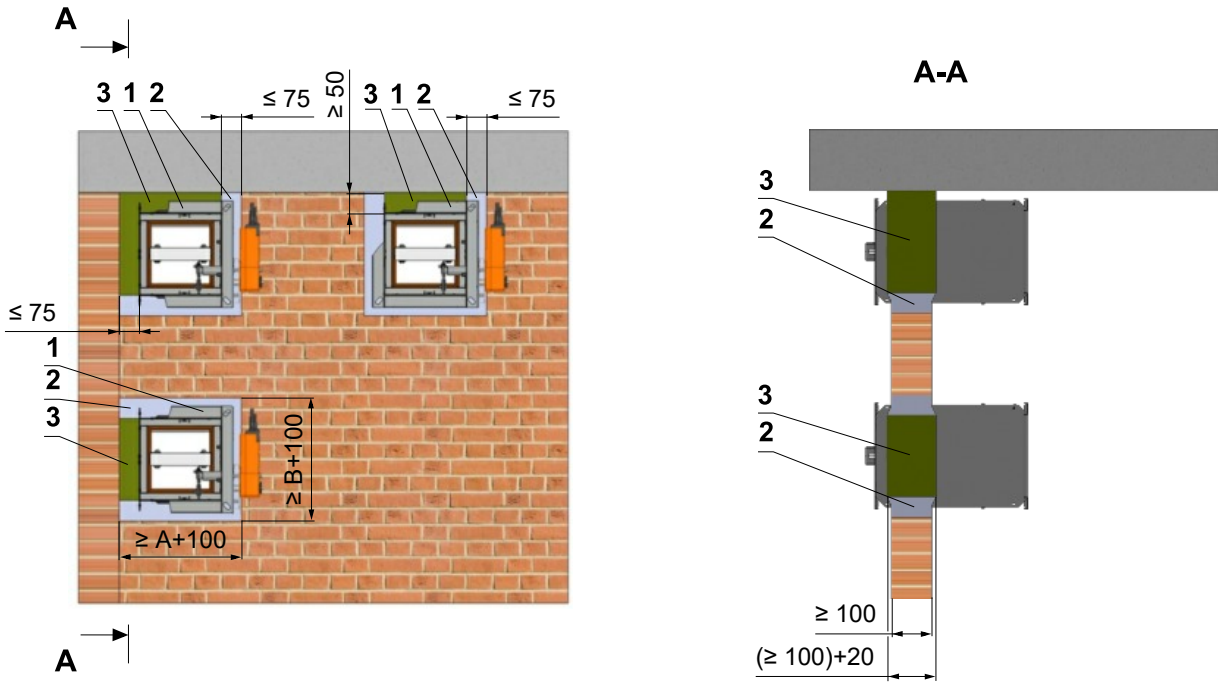
Distance between dampers 60 mm

Flange to flange connection - Up to 4 dampers can be installed.

Up to 4 dampers can be installed **Shown schemes of incorporation and damper are illustrative only!**

Fig. 23 Solid wall construction- installation next to wall, ceiling- mortar or gypsum and mineral wool

EIS 90



Position:

1 Fire damper
2 Mortar or gypsum
3 Stuffing box (mineral stone wool min. density 140 kg/m^3)

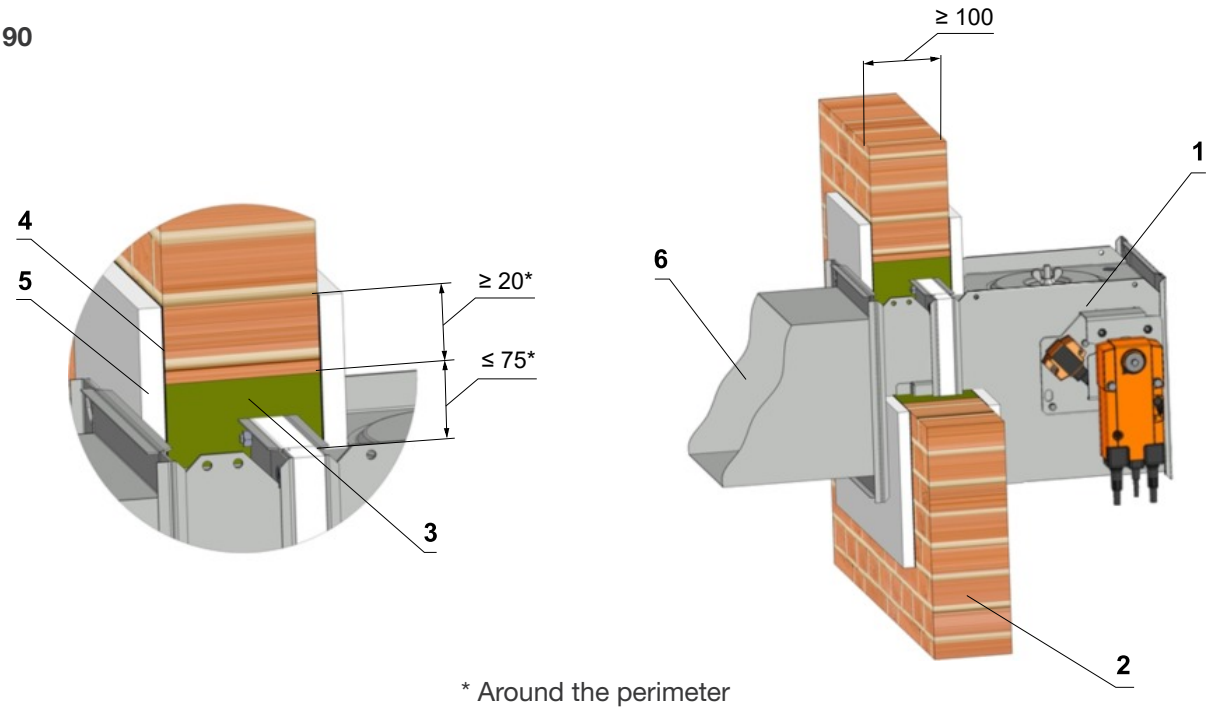
Notice:

- Gap between damper and construction is filled by mortar or gypsum and mineral wool
- Wool is fixed to damper body and construction by fire protection mastic
- Mineral wool thickness = construction thickness + 20 mm or 50 mm
- Installation is valid for ceiling construction

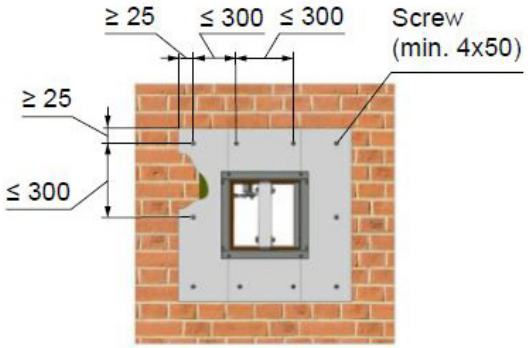
Shown schemes of incorporation and damper are illustrative only!

Fig. 24 Solid wall construction- stuffing box, fire protection mastic and cement lime plate

EIS 90



* Around the perimeter



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

Position:

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

Used materials - example:*

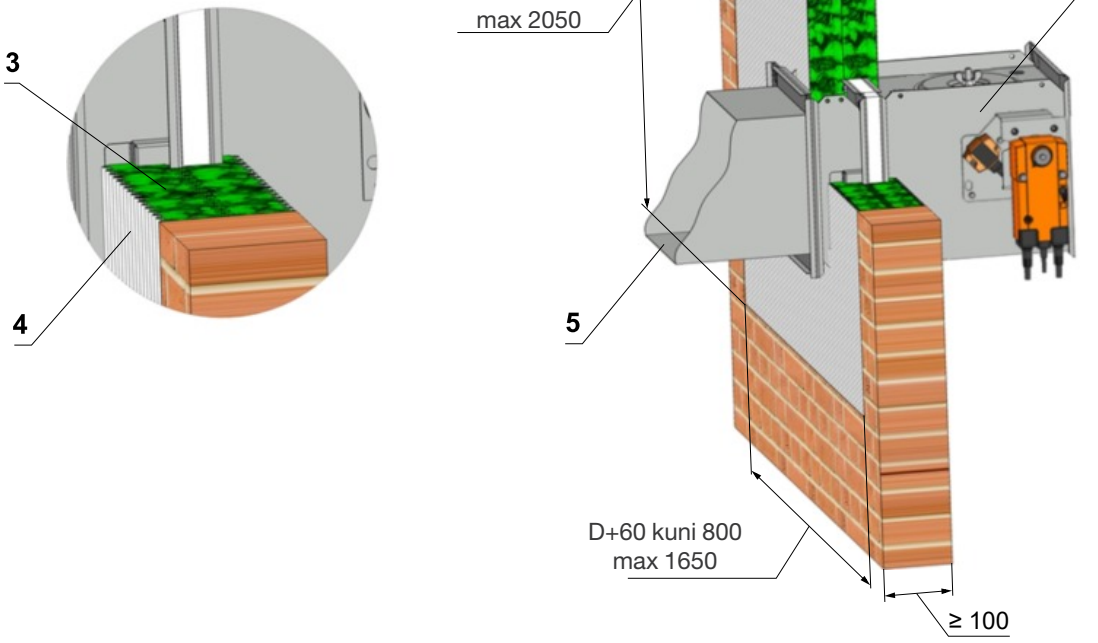
3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
4 Promastop - P, K, Hilti CFS-CT
5 Promatect - H

** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

The damper must be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 25 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

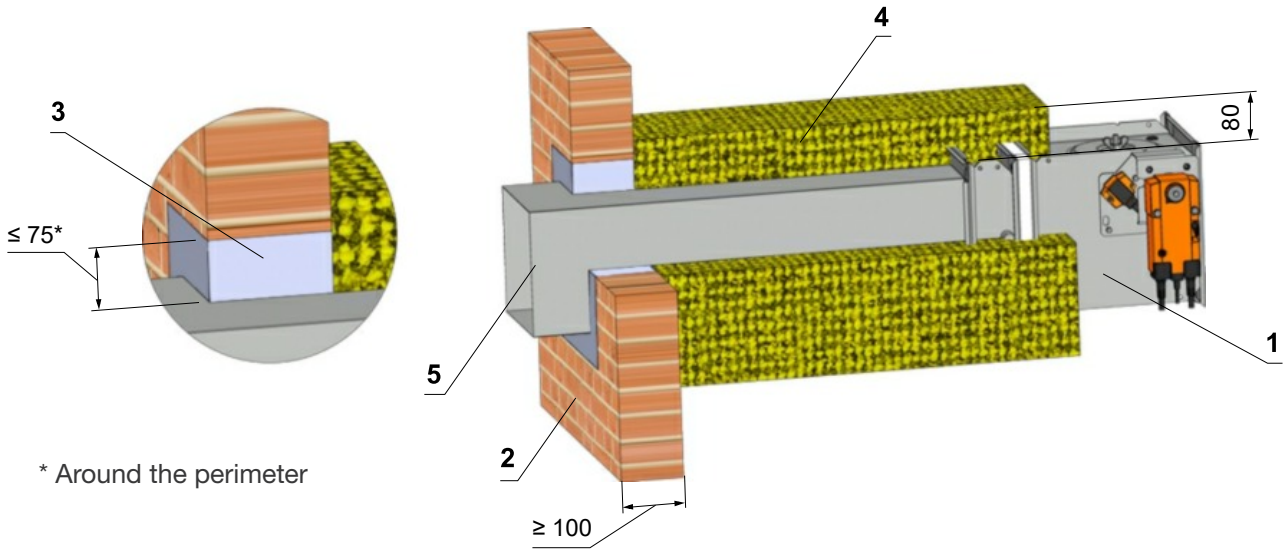
** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

Shown schemes of incorporation and damper are illustrative only!

5.3 Installation outside solid wall construction

Fig. 26 Outside solid wall construction- mineral wool- mortar or gypsum

EIS 60



* Around the perimeter

Position:

1 Fire damper
2 Solid wall construction
3 Mortar or gypsum
4 Stone wool with wired mat on one side, density 66 kg/m^3
5 Duct

Used materials - example:**

4 Isover Ultimate Protect SLAB 4.0, th. 80 mm ALU1

** The materials for stuffing box, fire protection mastic, lining and insulation materials can be replaced by another approved fire sealing system with equivalent properties.

The maximum distance of the fire damper from the structure is not limited and according to EN 15882-2, the required number of suspensions acc. to EN 1366-1:2014 must be used.

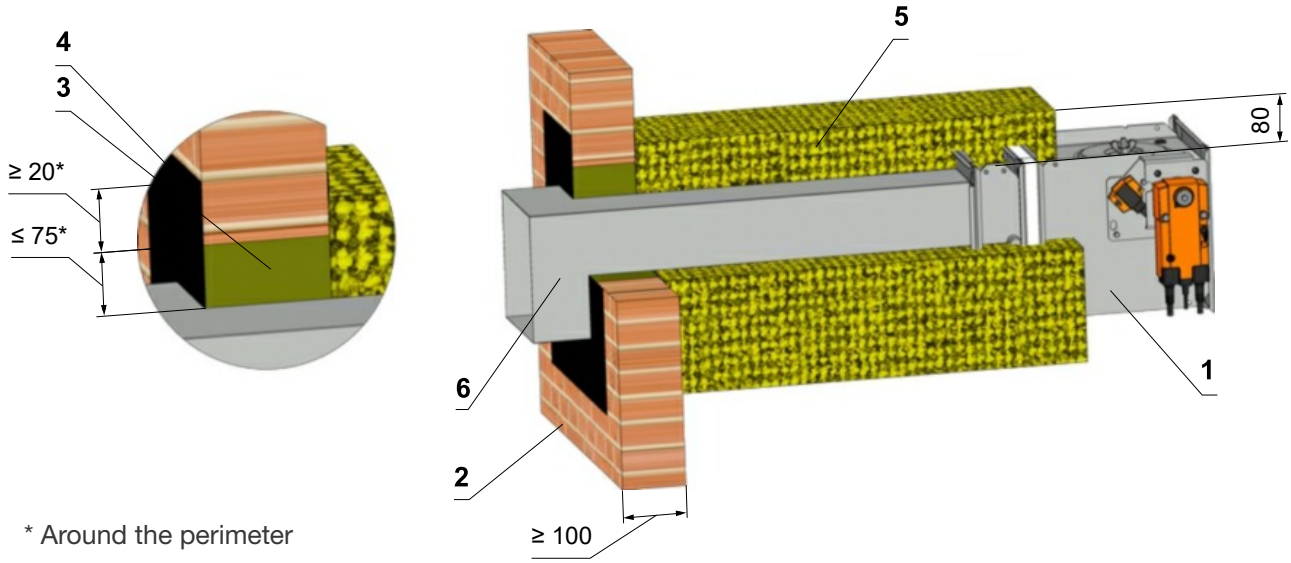
The duct at the point of penetration can be anchored to the fire wall construction!

Shown schemes of incorporation and damper are illustrative only!

Fig. 27 Outside solid wall construction- mineral wool- stuffing box and protection mastic

EIS 60

EIS 90



* Around the perimeter

Position:

1 Fire damper
2 Solid wall construction
3 Stuffing box (mineral stone wool min. density 150 kg/m^3)
4 Fire protection mastic min. thickness 1 mm
5 Stone wool with wired mat on one side, density 66 kg/m^3
6 Duct

Used materials - example:**

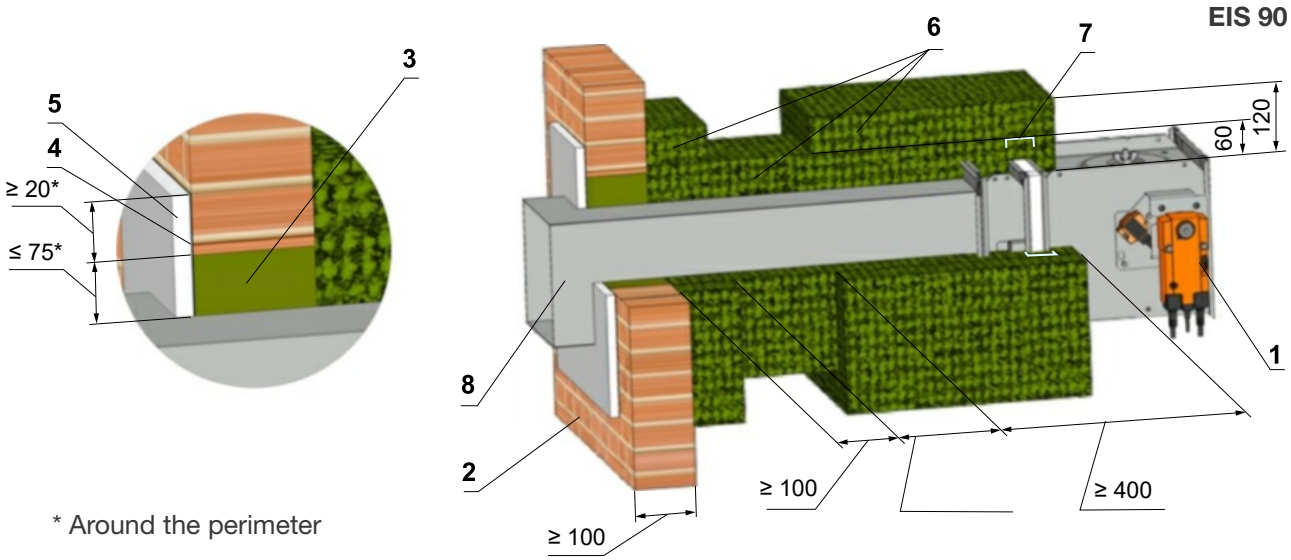
3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
4 Promastop - P, K, Hilti CFS-CT
5 Isover Ultimate Protect SLAB 4.0, th. 80 mm ALU1

** The materials for stuffing box, fire protection mastic, lining and insulation materials can be replaced by another approved fire sealing system with equivalent properties.

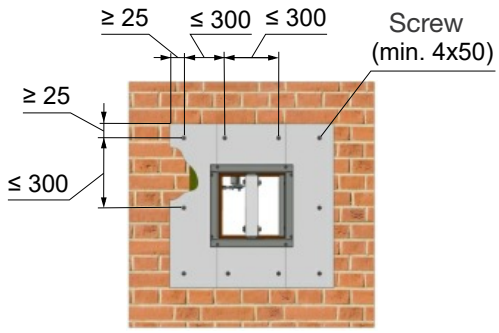
The maximum distance of the fire damper from the structure is not limited and according to EN 15882-2, the required number of suspensions acc. to EN 1366-1:2014 must be used.

The duct at the point of penetration can be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 28 Outside solid wall construction- mineral wool, stuffing box, fire protection mastic and cement lime plate.



* Around the perimeter



Screws has to be fixed in wall/ceiling construction.

(If it is needed use steel bracket).

Position:

1 Fire damper
2 Solid wall construction
3 Stuffing box (mineral stone wool min. density 140 kg/m^3)
4 Fire protection mastic min. thickness 1 mm
5 Cement lime plate min. thickness 15 mm (min. density 870 kg/m^3)
6 Stone wool with one side stitched wire fencing (min. density 105 kg/m^3), thickness 60 mm
7 Profil U25x40x25

** 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 see Fig. 81 Installation of profile U25x40x25 see Fig. 82

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

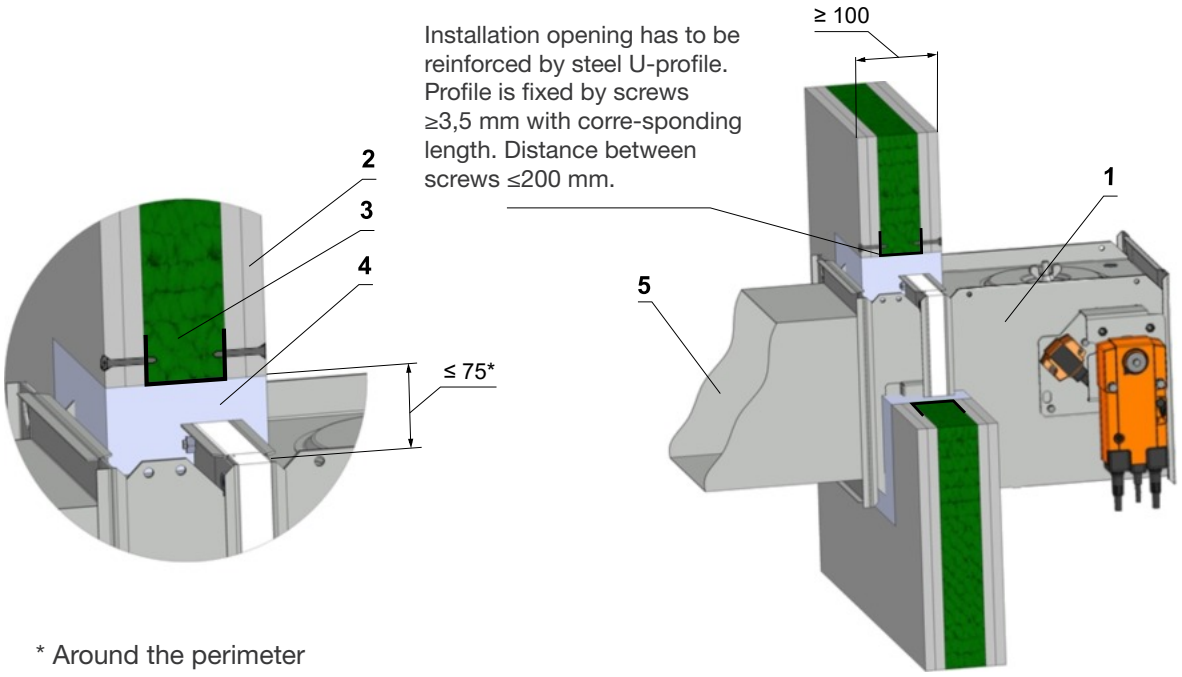
T - thickness of the insulation (mm)

The duct at the point of penetration can be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

5.4 Installation in gypsum wall construction

Fig. 29 Gypsum wall construction- mortar or gypsum

EIS 120
EIS 90



* Around the perimeter

Position:

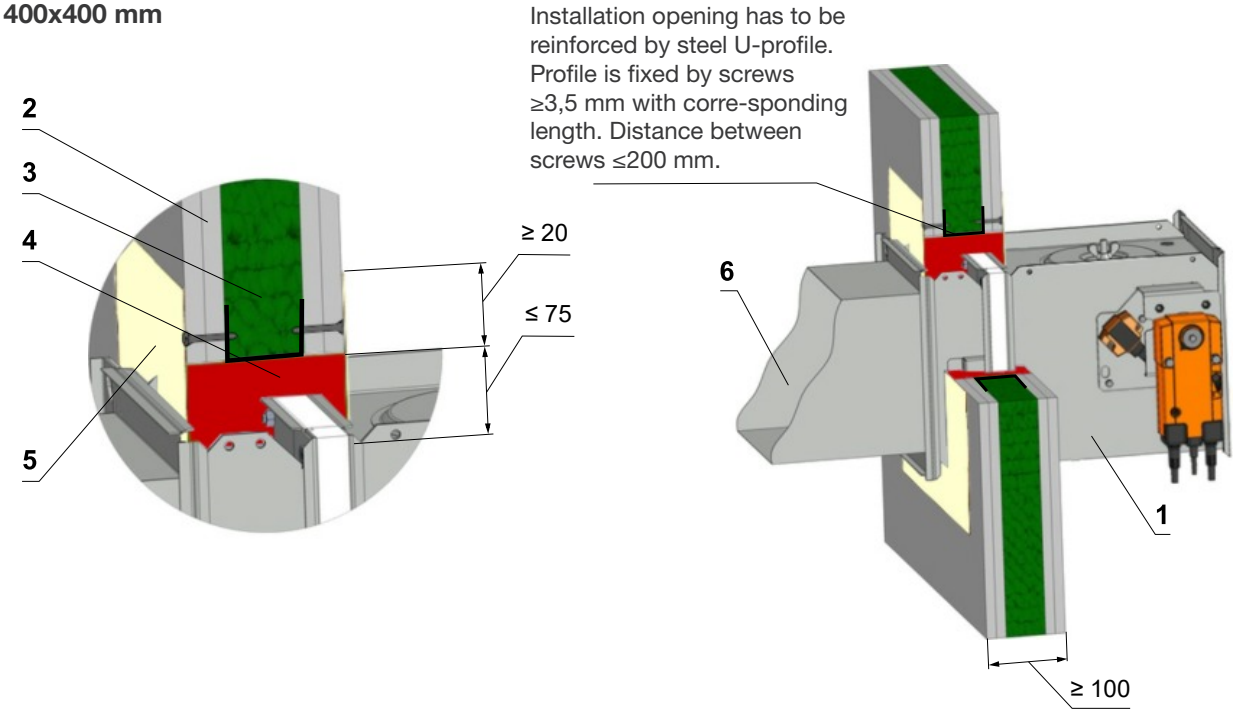
1 Fire damper
2 Gypsum plate
3 Mineral wool (type depending on the type of construction)
4 Mortar or gypsum
5 Duct

Shown schemes of incorporation and damper are illustrative only! Installation in gypsum wall construction!

Fig. 30 Gypsum wall construction- fire protection foam with stucco plaster

EIS 60
EIS 45
EIS 30

Maximal damper dimensions
400x400 mm



Position:

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

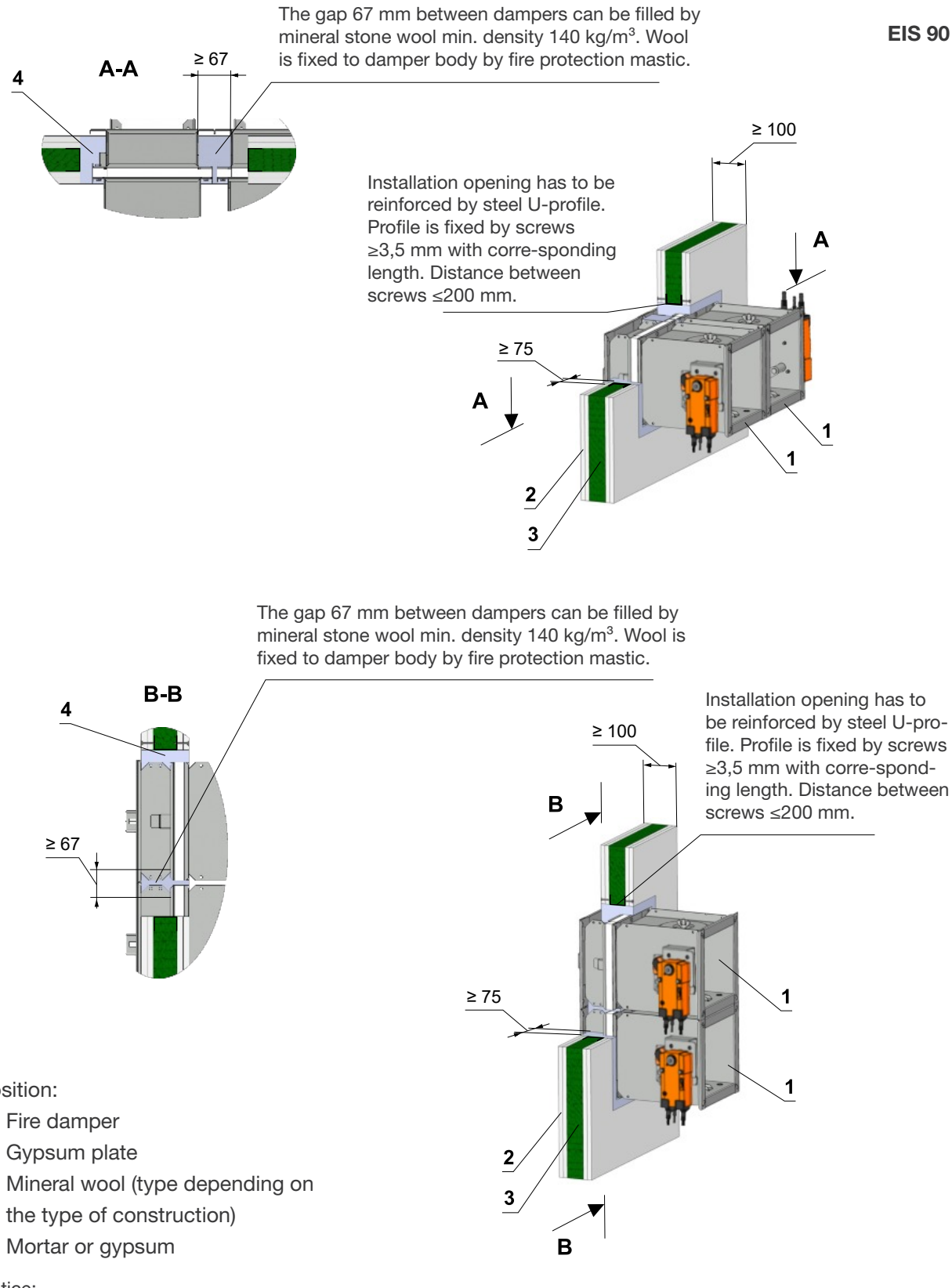
Used materials - example:*

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

The damper must be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 31 Gypsum wall construction- battery- mortar or gypsum

EIS 90



Position:

1 Fire damper
2 Gypsum plate
3 Mineral wool (type depending on the type of construction)
4 Mortar or gypsum

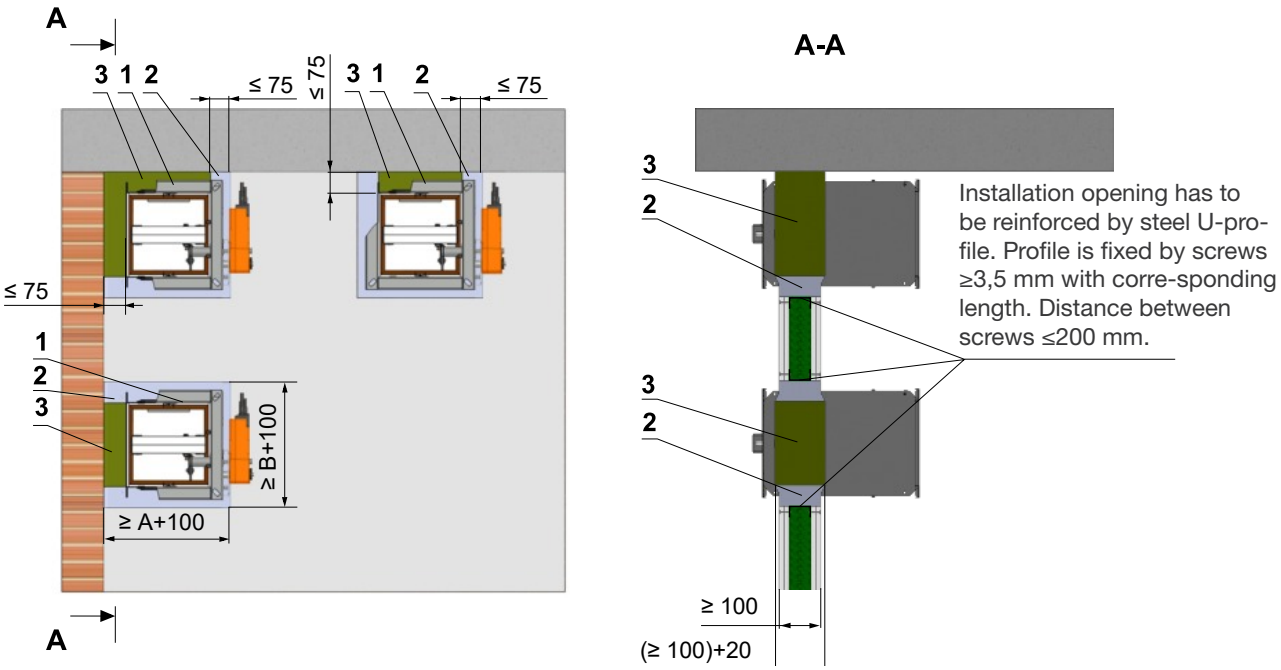
Notice:

Installation opening for each damper has minimal dimensions
a x b = (A+100) x (2xB +100) mm or (2xA+100) x (B +100) mm
Gap between damper and construction is filled by mortar or gypsum
Distance between dampers 60 mm
Flange to flange connection - Up to four dampers can be installed

Shown schemes of incorporation and damper are illustrative only!hown schemes of incorporation

Fig. 32 Gypsum wall construction- installation next to wall, ceiling- mortar or gypsum and mineral wool

EIS 90



Position:

1 Fire damper
2 Mortar or gypsum
3 Mineral stone wool min. density 140 kg/m^3

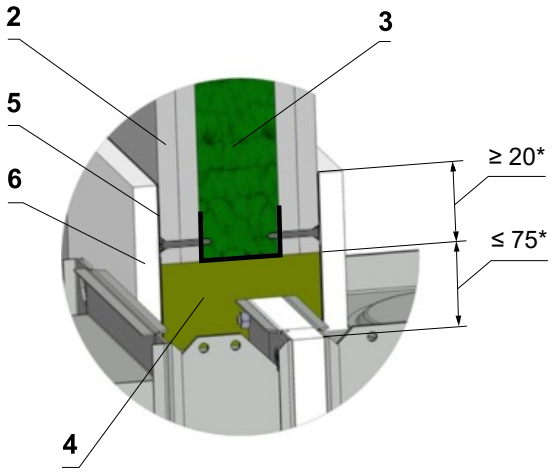
Notice:

- Gap between damper and construction is filled by mortar or gypsum and mineral wool
- Wool is fixed to damper body and construction by fire protection mastic
- Mineral wool thickness = construction thickness + 20 mm or 50 mm
- Installation is valid for ceiling construction

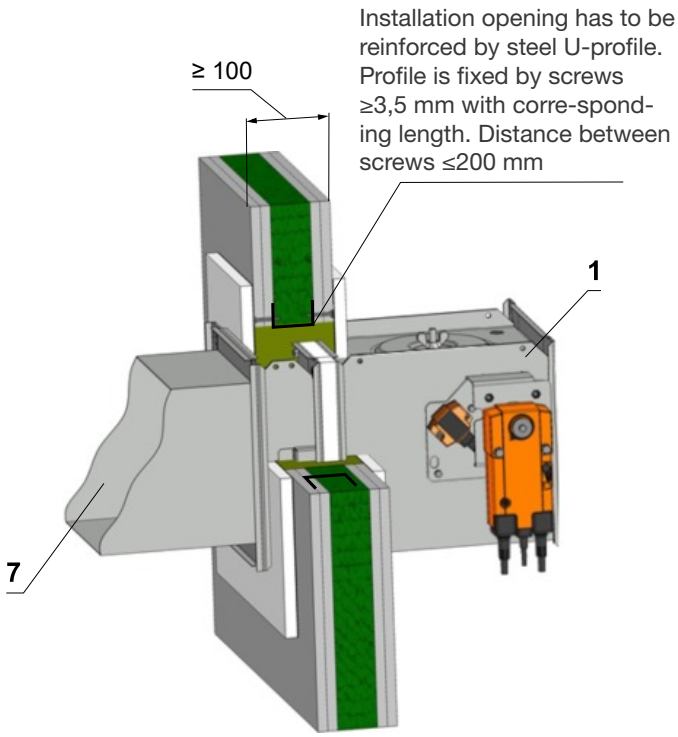
Shown schemes of incorporation and damper are illustrative only!

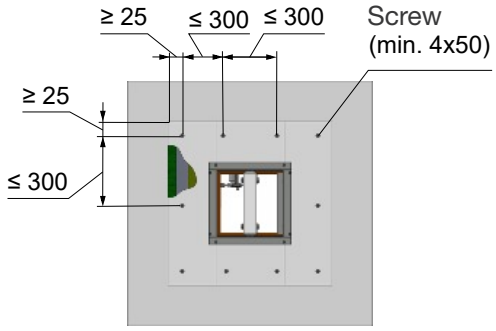
Fig. 33 Gypsum wall construction- stuffing box, fire protection mastic and cement lime plate

EIS 90



* Around the perimeter





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

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 Duct

Used materials - example:**

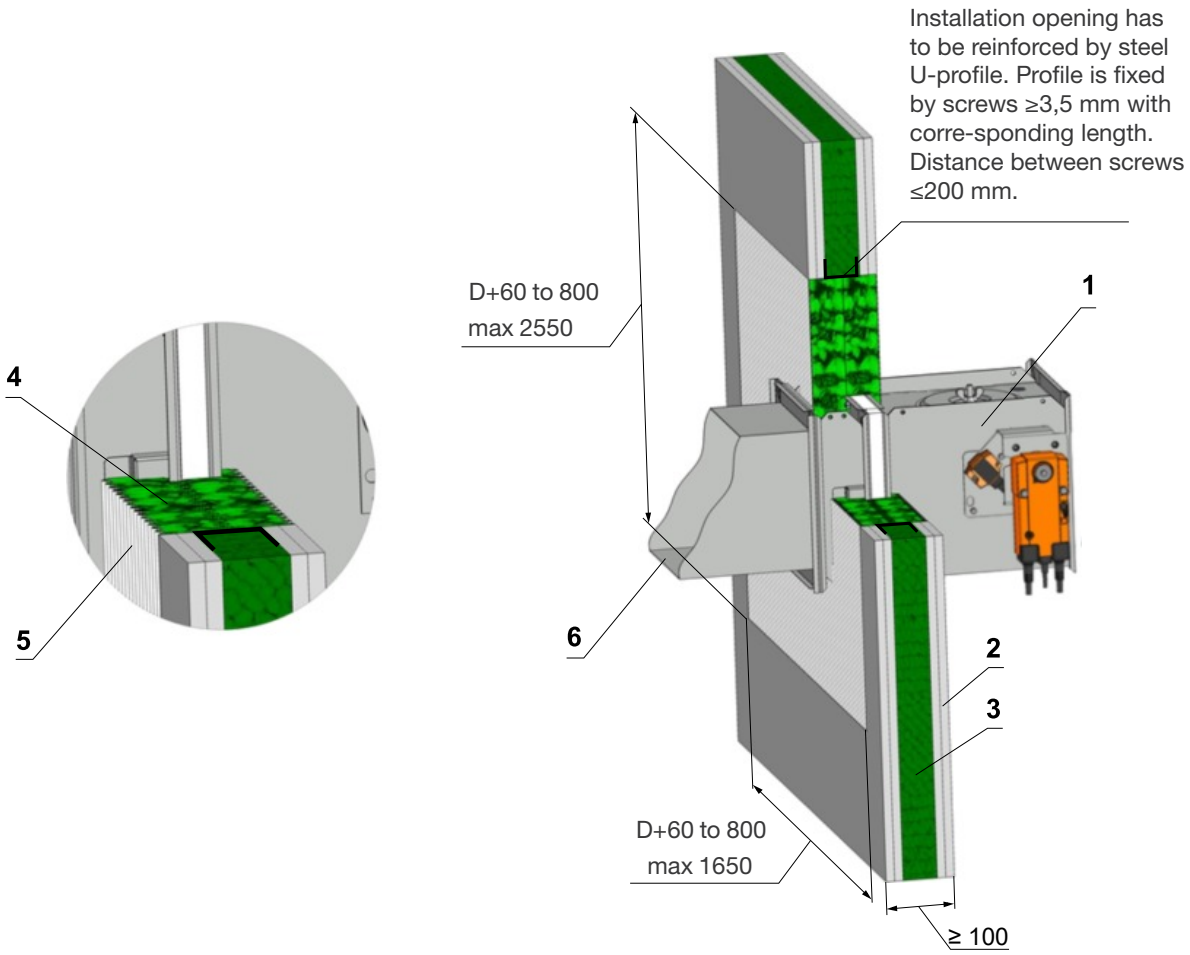
4 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
5 Promastop - P, K, Hilti CFS-CT
6 Promatect - H

** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

The damper must be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 34 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

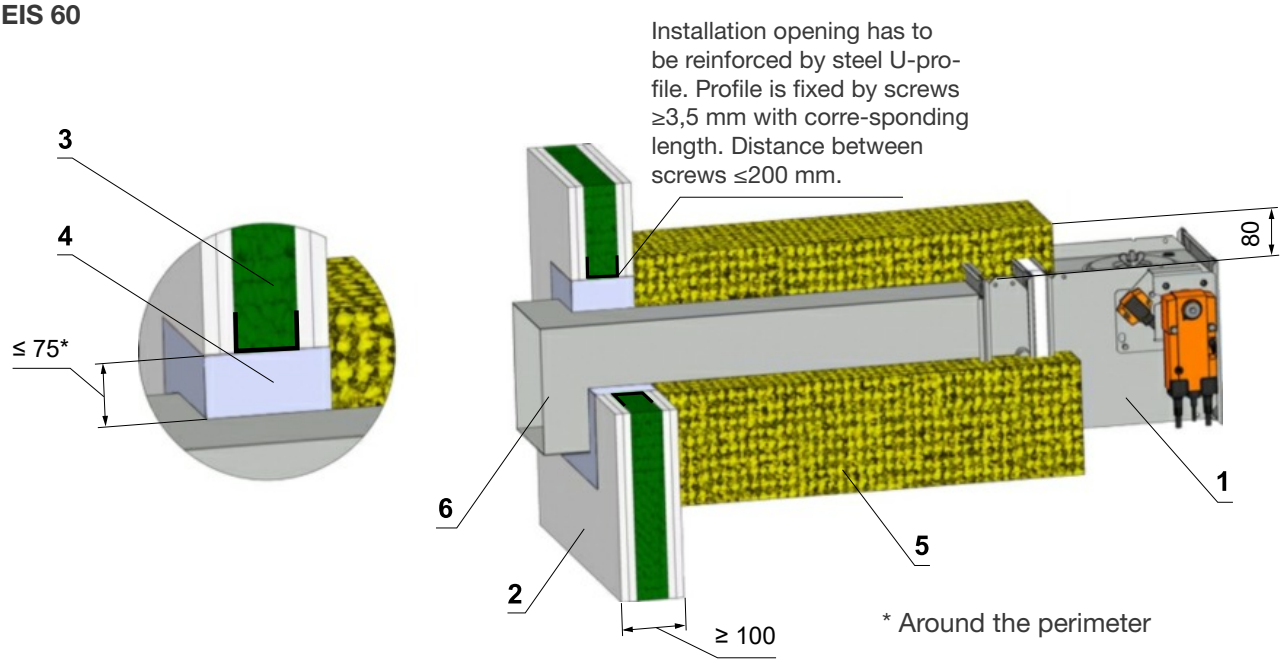
** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

Shown schemes of incorporation and damper are illustrative only!

5.5 Installation outside gypsum wall construction

Fig. 35 Outside gypsum wall construction- mineral wool- mortar or gypsum

EIS 60



EIS 60

Position:

1 Fire damper
2 Gypsum plate
3 Mineral wool (type depending on the type of construction)
4 Mortar or gypsum
5 Stone wool with wired mat on one side, density 66 kg/m^3
6 Duct

Used materials - example:**

5 Isover Ultimate Protect SLAB 4.0, th. 80 mm ALU1

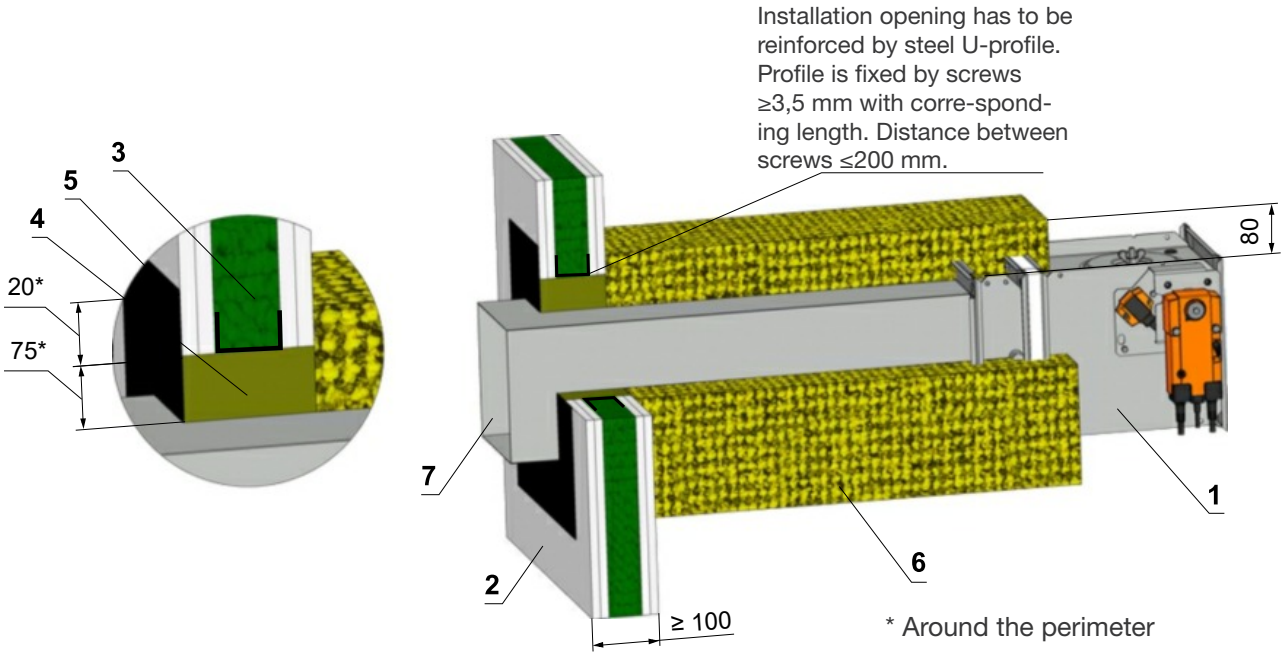
** The materials for stuffing box, fire protection mastic, lining and insulation materials can be replaced by another approved fire sealing system with equivalent properties. The maximum distance of the fire damper from the structure is not limited and according to EN 15882-2, the required number of suspensions acc. to EN 1366-1:2014 must be used.

The duct at the point of penetration can be anchored to the fire wall construction!

Shown schemes of incorporation and damper are illustrative only!

Fig. 36 Outside gypsum wall construction- mineral wool- stuffing box and fire protection mastic

EIS 60



Position:

1 Fire damper
2 Gypsum plate
3 Mineral wool (type depending on the type of construction)
4 Stuffing box (mineral stone wool min. density 150 kg/m^3)
5 Fire protection mastic min. thickness 1 mm
6 Stone wool with wired mat on one side, density 66 kg/m^3
7 Duct

Used materials - example:**

4 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
5 Promastop - P, K, Hilti CFS-CT
6 Isover Ultimate Protect SLAB 4.0, th. 80 mm ALU1

** The materials for stuffing box, fire protection mastic, lining and insulation materials can be replaced by another approved fire sealing system with equivalent properties. The maximum distance of the fire damper from the structure is not limited and according to EN 15882-2, the required number of suspensions acc. to EN 1366-1:2014 must be used.

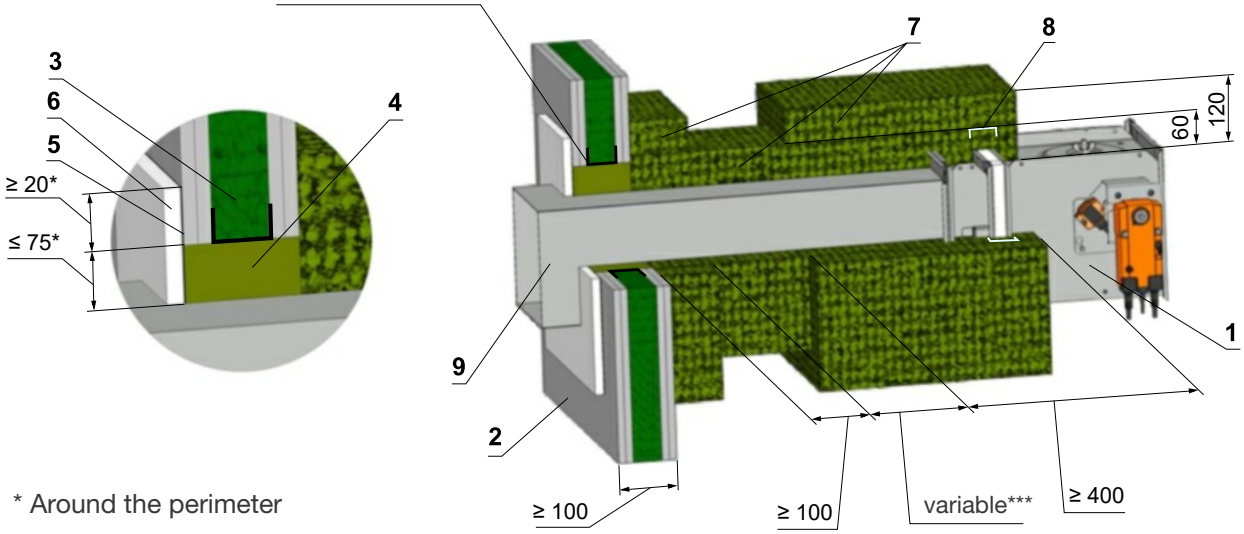
The duct at the point of penetration can be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 37 Outside gypsum wall construction- mineral wool- stuffing box and fire protection mastic and cement plate

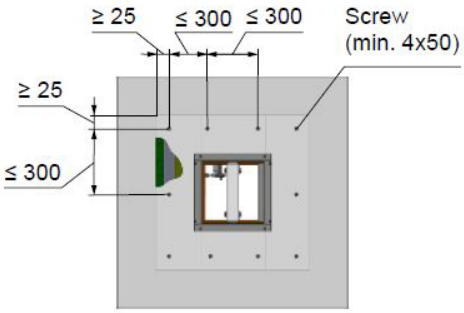
EIS 90

EIS 120 ***

Installation opening has to be reinforced by steel U-profile. Profile is fixed by screws ≥3,5 mm with corre-sponding length. Distance between screws ≤200 mm.



* Around the perimeter



Position:

1 Fire damper
2 Gypsum plate
3 Mineral wool (type depending on the type of construction)
4 Stuffing box (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 with one side stitched wire fencing (min. density 105 kg/m^3), thickness 60 mm
8 Profil U25x40x25 ****
9 Duct

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

** 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 see Fig. 81 Installation of profile U25x40x25 see Fig. 82

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

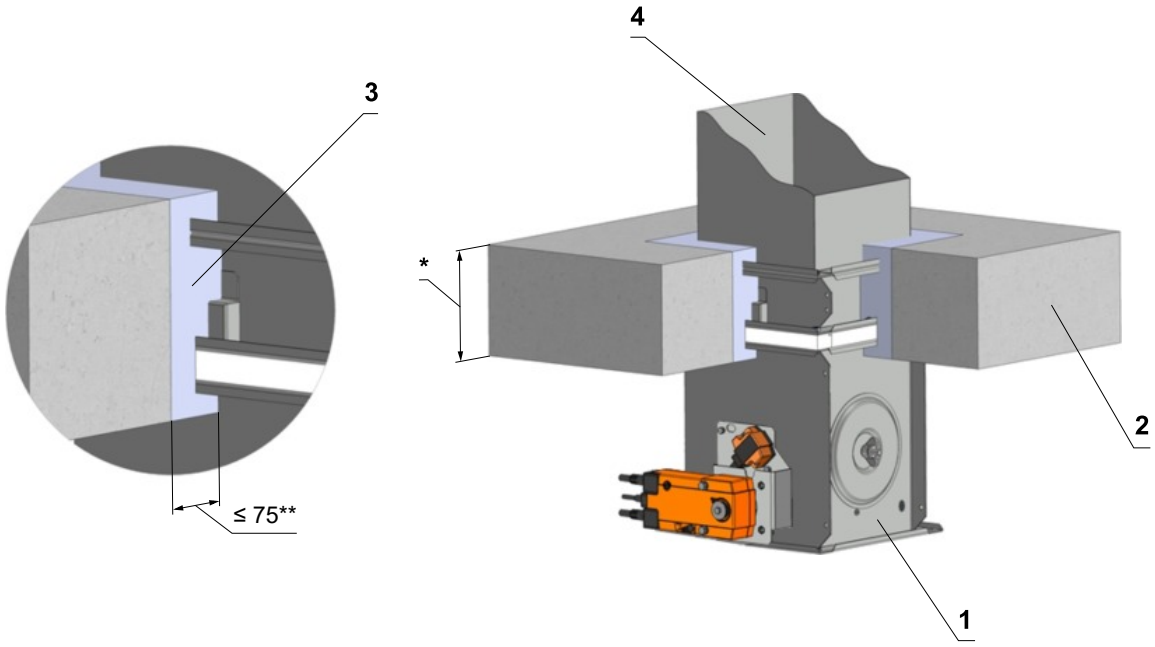
T - thickness of the insulation (mm)

The duct at the point of penetration can be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

5.6 Installation in solid ceiling construction

Fig. 38 Solid ceiling construction- mortar or gypsum

EIS 120
EIS 90



Position:

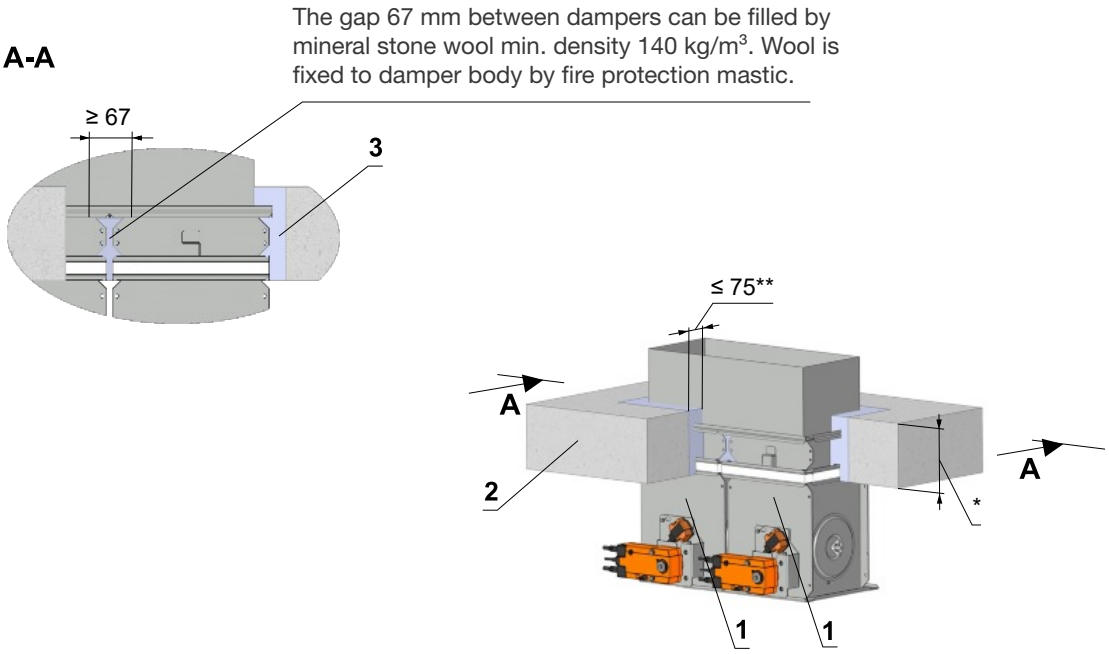
1 Fire damper
2 Solid ceiling construction
3 Mortar or gypsum
4 Duct

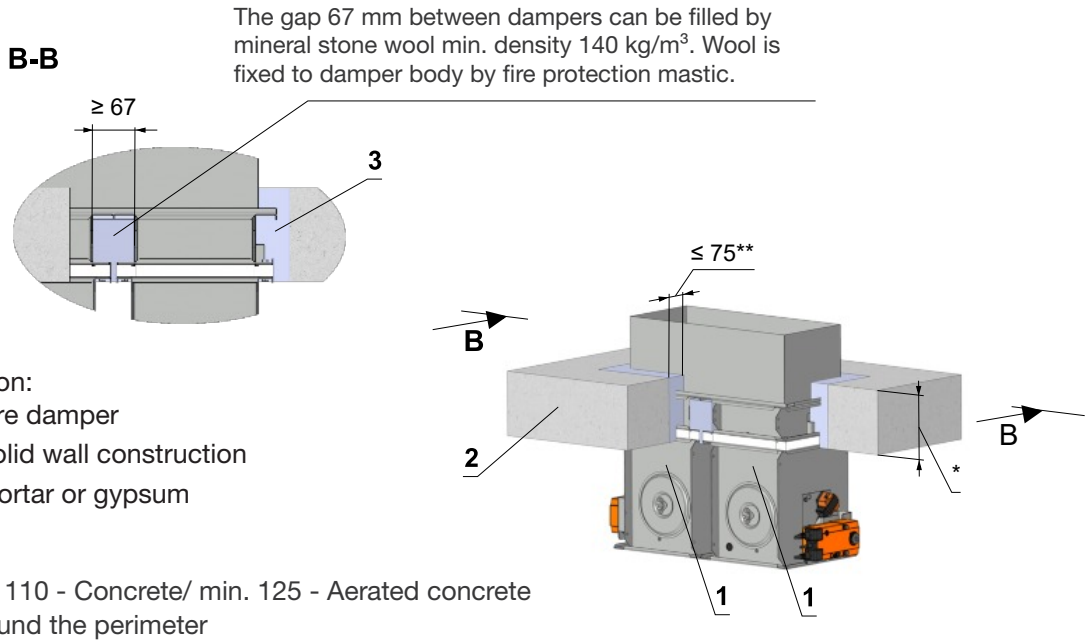
* min. 110 - Concrete/ min. 125 - Aerated concrete
** Around the perimeter

Shown schemes of incorporation and damper are illustrative only!

Fig. 39 Solid ceiling construction- battery- mortar or gypsum

EIS 90





Position:
1 Fire damper
2 Solid wall construction
3 Mortar or gypsum

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

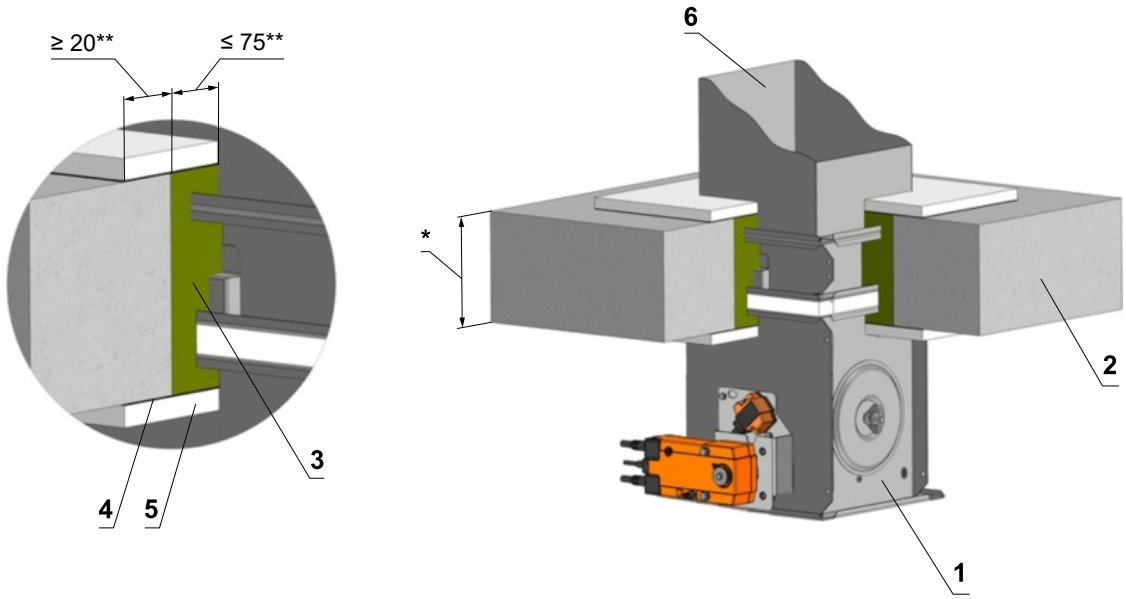
Notice:

- Installation opening for each damper has minimal dimensions
- a x b = (A+100) x (2xB +100) mm or (2xA+100) x (B +100) mm
- Gap between damper and construction is filled by mortar or gypsum
- Distance between dampers 60 mm
- Flange to flange connection - Up to 4 dampers can be installed

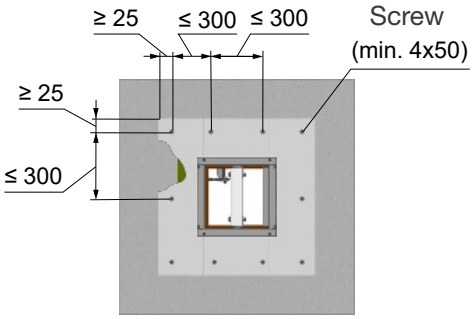
Shown schemes of incorporation and damper are illustrative only!

Fig. 40 Solid ceiling construction- stuffing box, fire protection mastic and cement lime plate

EIS 90



** Around the perimeter



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

Position:

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

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

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

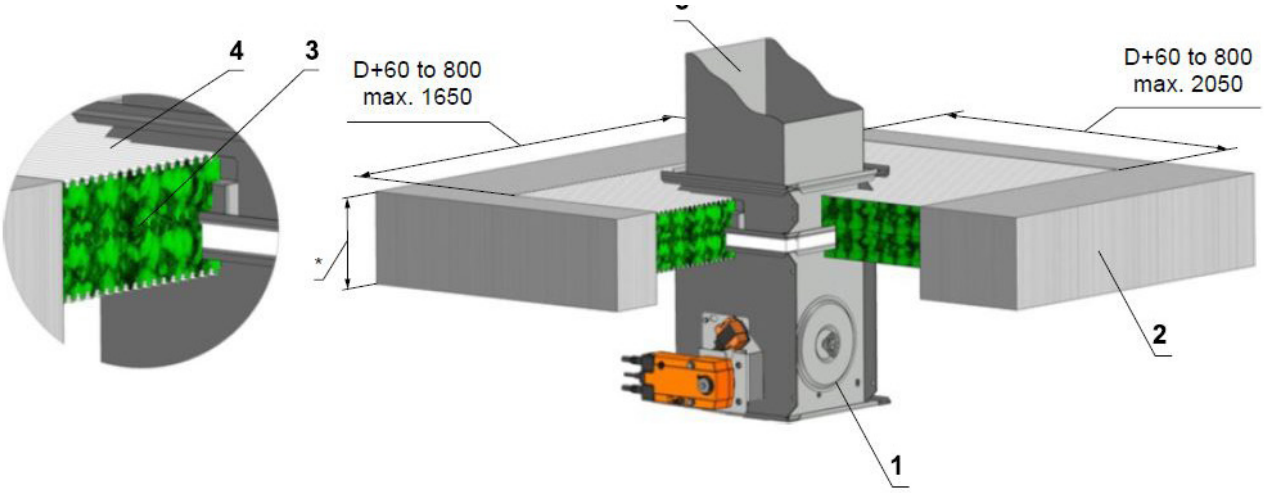
***** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.**

The damper must be anchored to the fire ceiling construction!

Shown schemes of incorporation and damper are illustrative only!

Fig. 41 Solid ceiling construction- Weichschott

EIS 90



Position:

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

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

Used materials - example:**

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

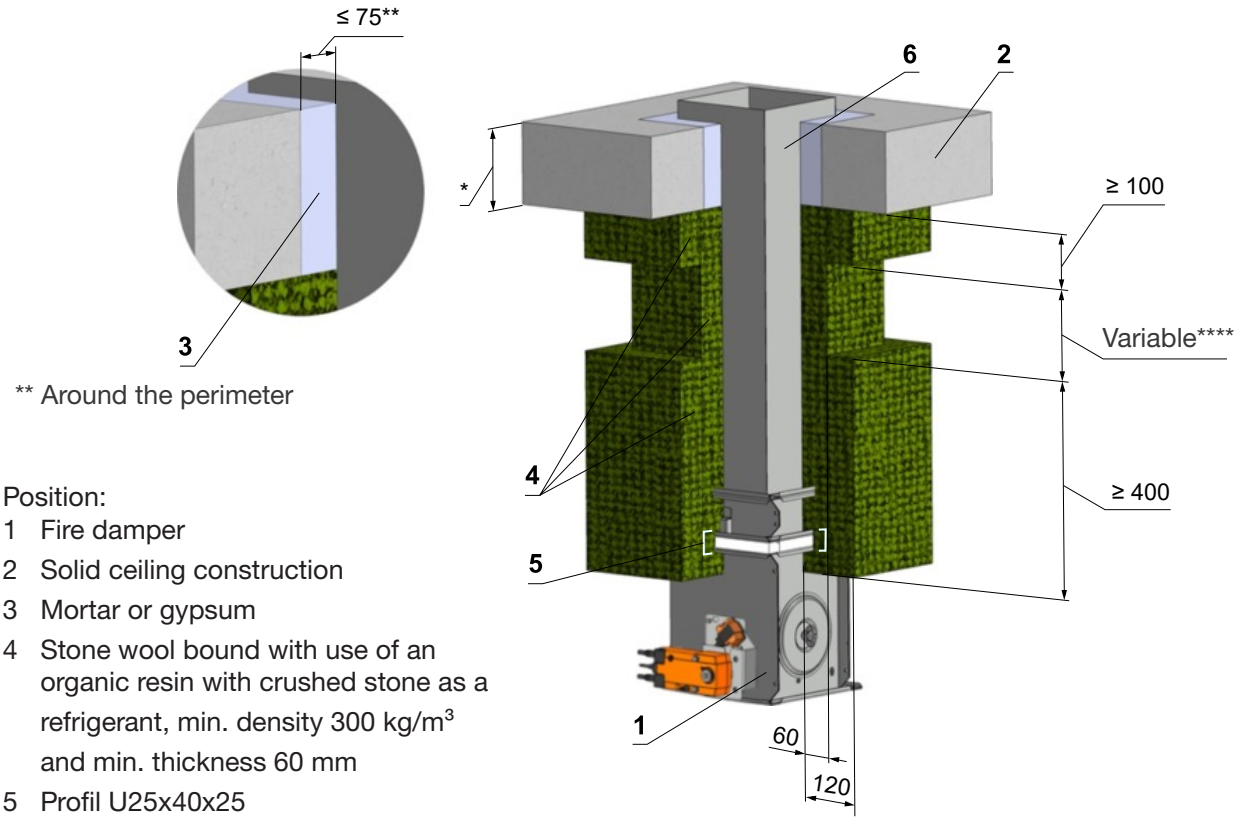
**** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.**

Shown schemes of incorporation and damper are illustrative only!

5.7 Installation outside solid ceiling construction

Fig. 42 Outside solid ceiling construction- mineral wool- mortar and gypsum

EIS 90



** Around the perimeter

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/m^3 and min. thickness 60 mm
5 Profil U25x40x25
7 Duct

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

Used materials - example:***

4 Rockwool Wired Mat 105 th. 60 mm

** 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 see Fig. 81 Installation of profile U25x40x25 see Fig. 82

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

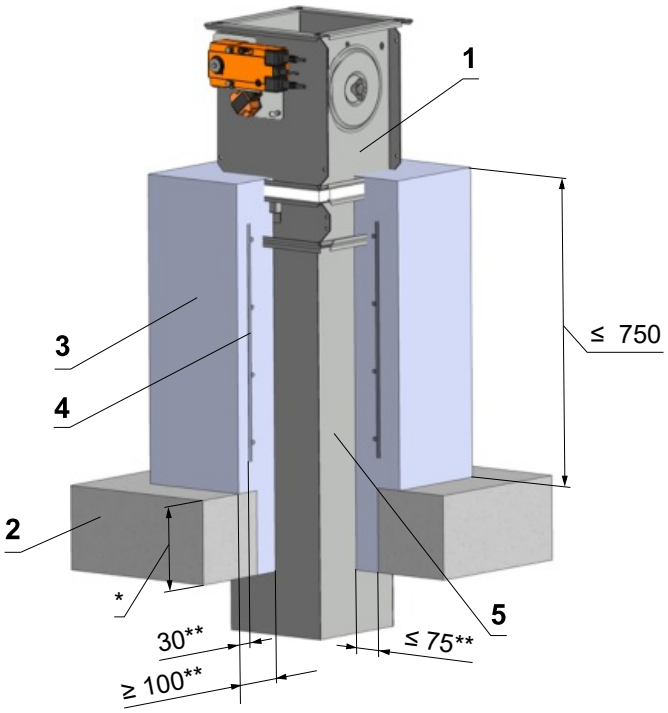
T - thickness of the insulation (mm)

The duct at the point of penetration can be anchored to the fire ceiling construction!

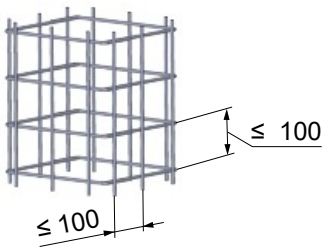
Shown schemes of incorporation and damper are illustrative only!

Fig. 43 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

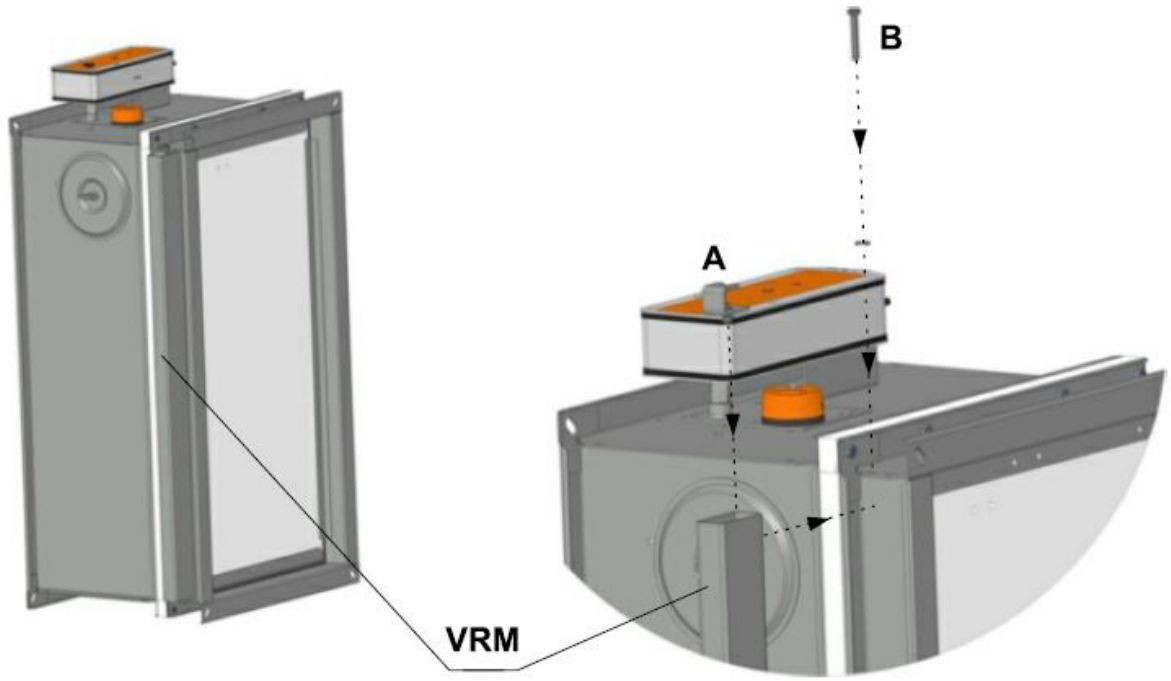
Shown schemes of incorporation and damper are illustrative only!

6. VRM reinforcing frame

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

Fig. 44 Fixing of reinforcement to damper body VRM

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



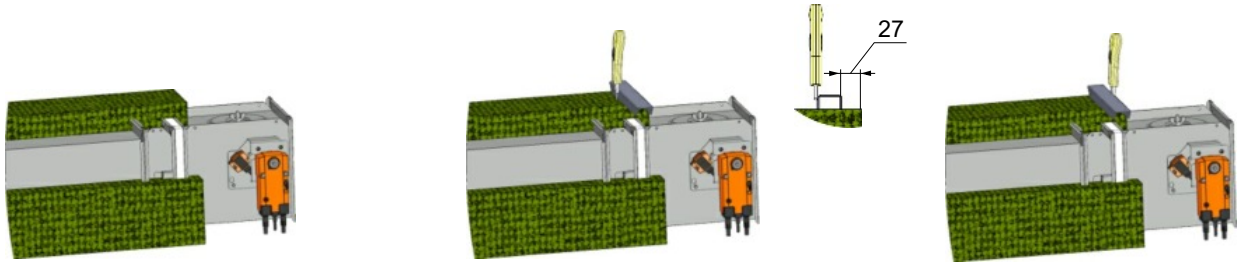
1. Insert part A into reinforcement VRM
2. Set up nut of the part A under correct hole
3. Lock screw B
3. It has to be done on each corner of VRM

Shown dampers are illustrative only!

Fig. 45 Installation procedure

EIS 90
EIS 120

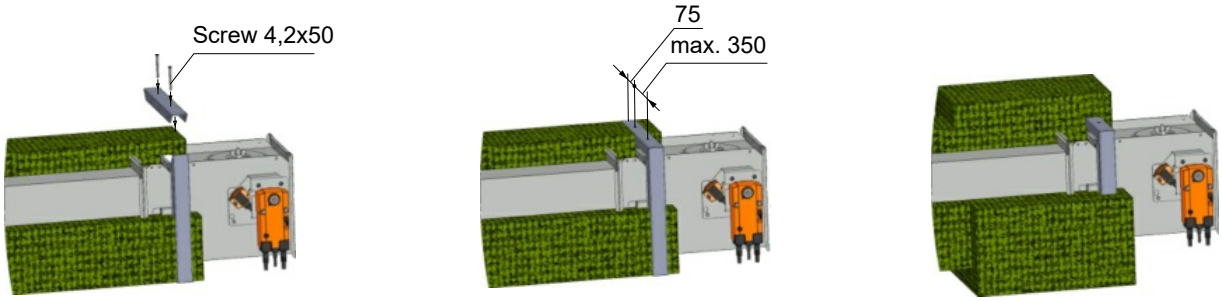
1) Cut the groove for profil U25x40x25



2) Insert profile into groove

3) Fix profile

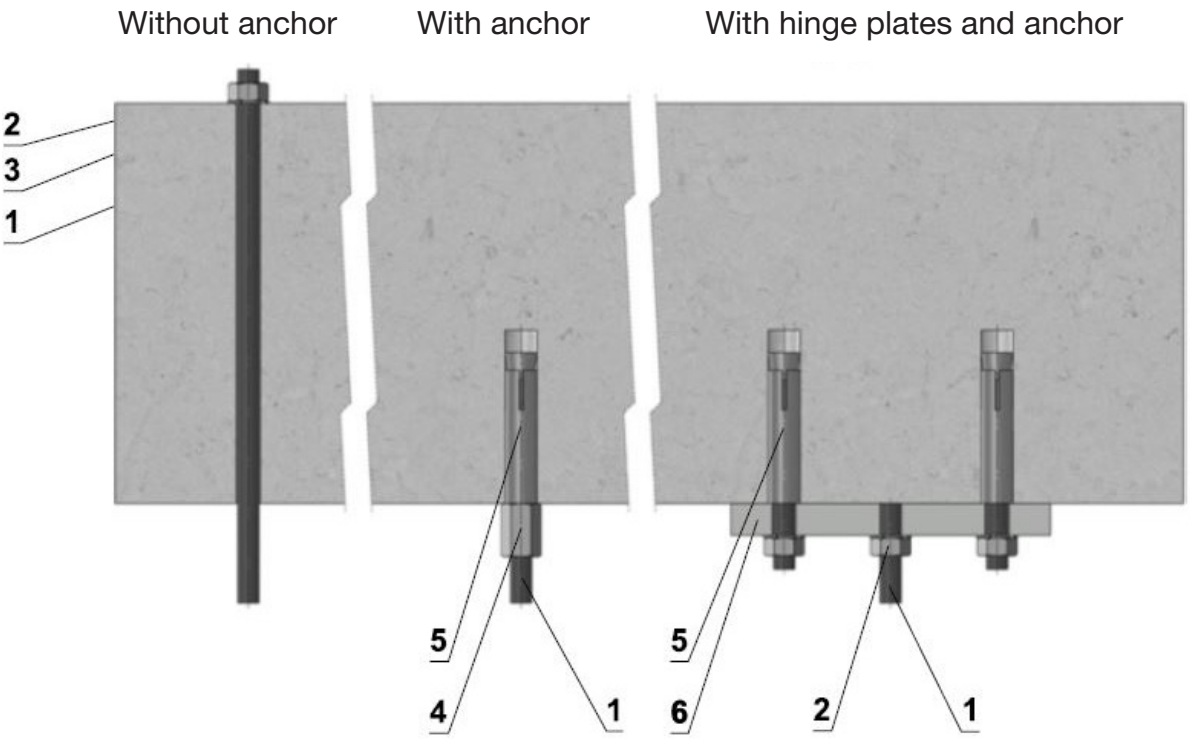
4) Fix second layer of insulation



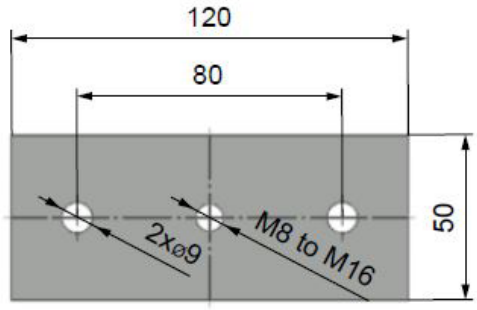
Installation details see chapter 9.4
Shown schemes of incorporation and damper are illustrative only!

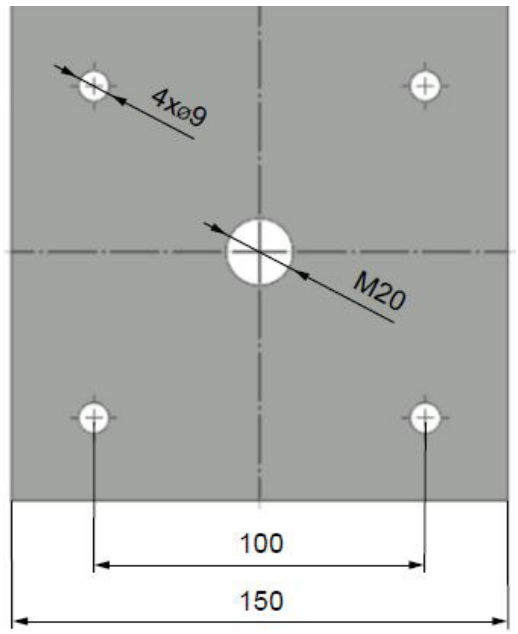
7. Suspension systems

8. Fig. 46 Mounting to the ceiling wall



Hingeplates





Position:

1 Threaded rod M8 – M20
2 Nut
3 Washer
4 Coupling Nut
5 Anchor
6 Hinge plate - min. thickness 10 mm

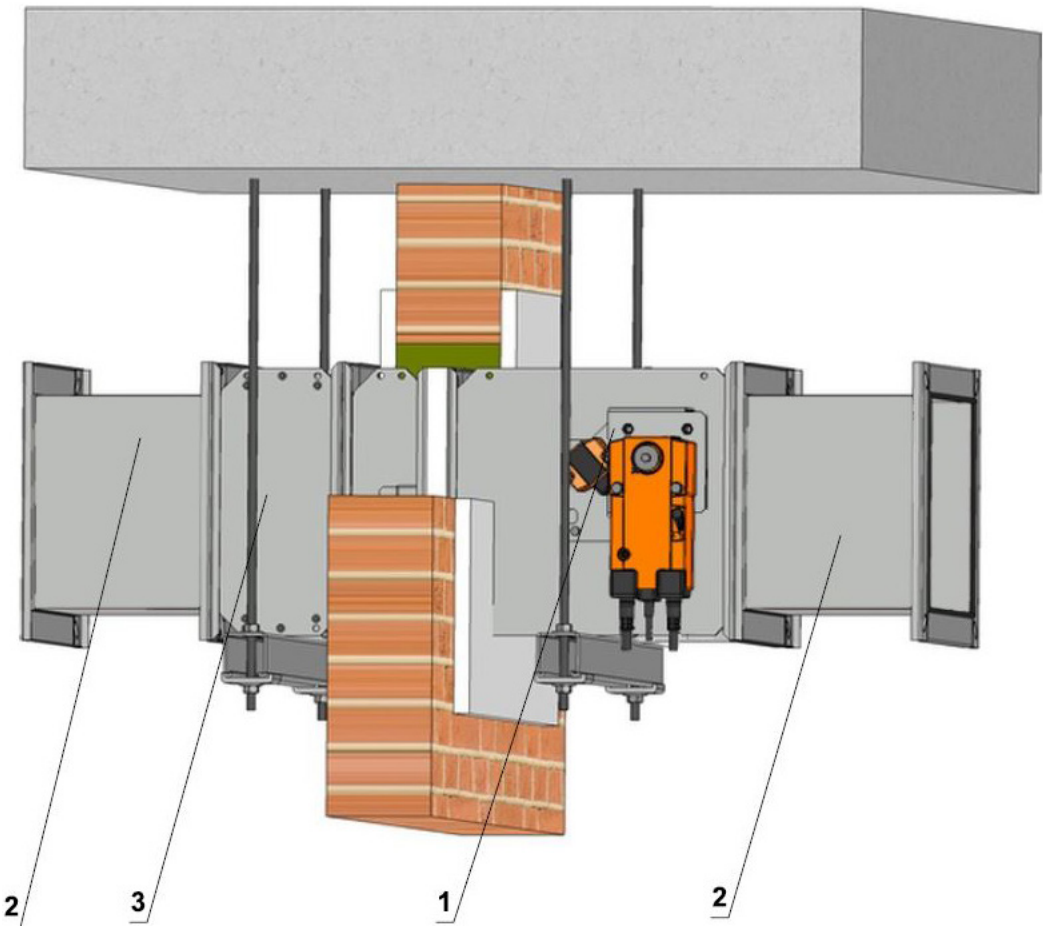
Load capacities of threaded hanger rods F [N] at the required resistance 90 minutes

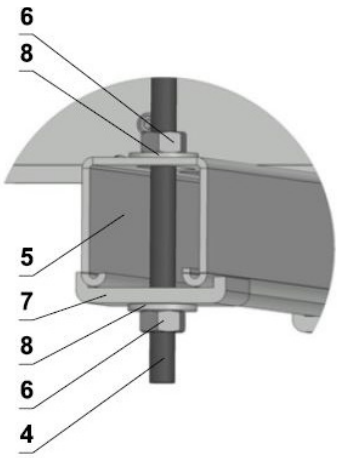
Size	As [mm²]	Weigh G [kg]	
		for 1 piece	for 1 pair
M8	366	22	44
M10	58	35	70
M12	84,3	52	104
M14	115	70	140
M16	157	96	192
M18	192	117	234
M20	245	150	300

8.1 Horizontal installation

Fire dampers can be suspended by using threaded rods and a mounting profiles.
Load the suspension system depend on weight of the fire damper.
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.
Threaded rods longer than 1,5 m require fire-resistant insulation.
Threaded rod fixing to the ceiling construction.

Fig. 47 Suspension- horizontal duct





Position:
1 Fire damper
2 Damping pad
3 Extension piece
4 Threaded rod
5 Mounting rail
6 Nut
7 U - Washer
8 Washer

Examples of using materials:
HILTI, SIKLA, MÜPRO etc.

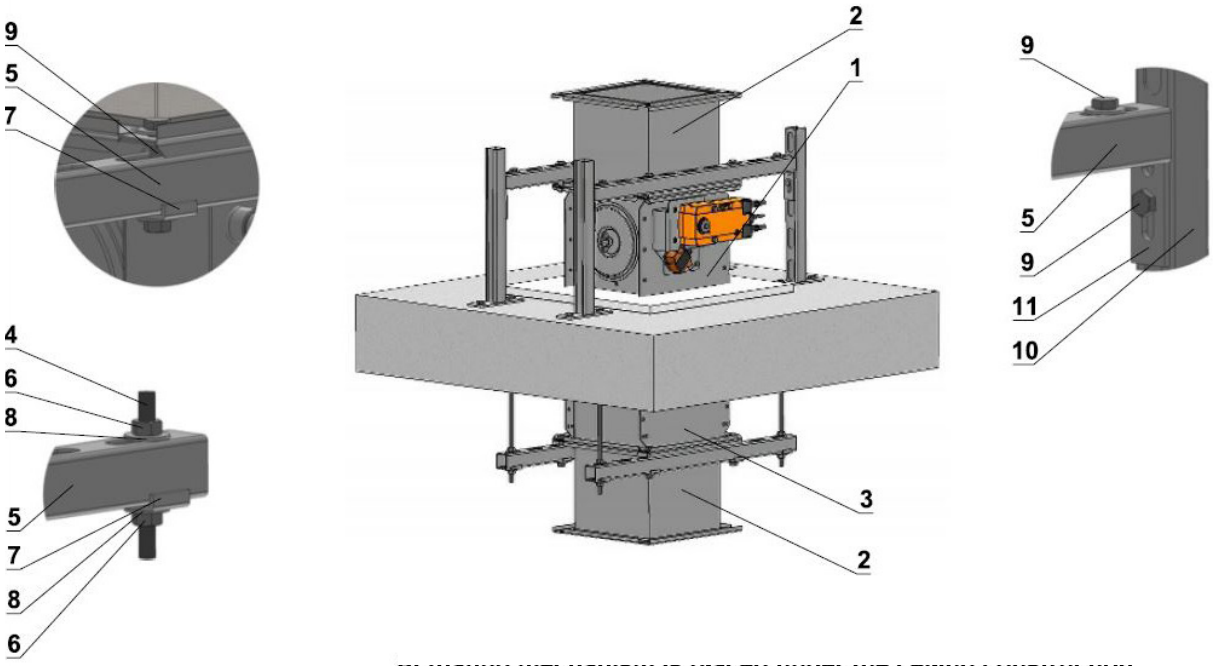
Shown schemes of incorporation and damper are illustrative only!

8.2 Vertical installation

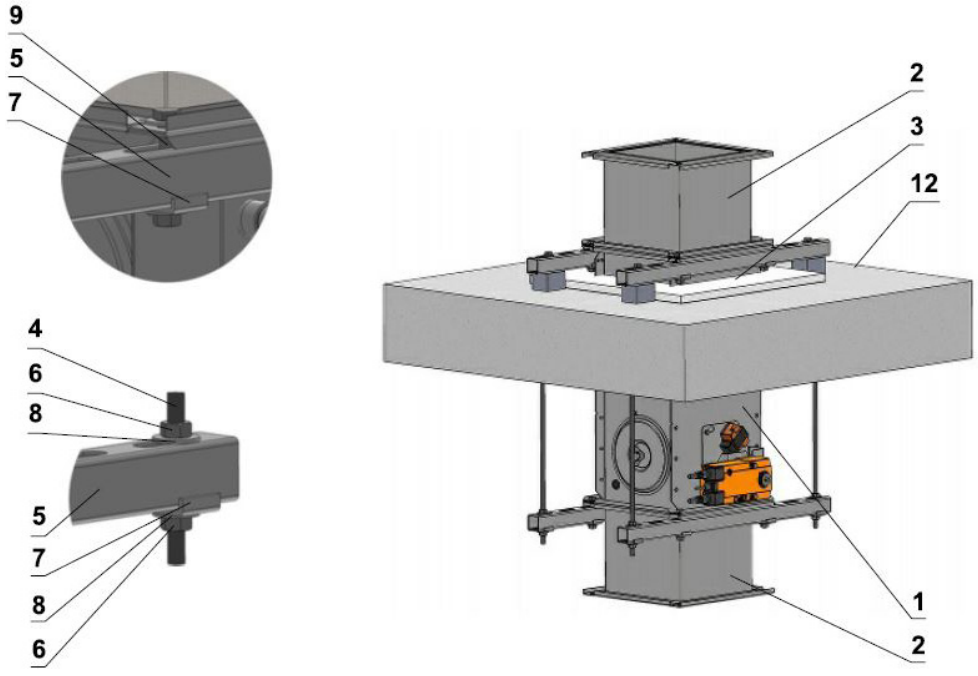
Fire dampers can be suspended by using threaded rods and a mounting profiles.
Load the suspension system depend on weight of the fire damper.
Damper can be suspended from the ceiling construction or supported above the ceiling construction.
Damper assembly procedures must be done so as all load transfer 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.
Threaded rods longer than 1,5 m require fire-resistant insulation.

Fig. 48 Suspension- vertical duct

Actuating mechanism is placed above the ceiling construction.



Actuating mechanism is placed under the ceiling construction.



Position:
1 Fire damper
2 Damping pad
3 Extension piece
4 Threaded rod
5 Mounting rail
6 Nut
7 U - Washer
8 Washer
9 Screw connection
10 Mounting profile
11 Mounting bracket
12 Fire-resistant board

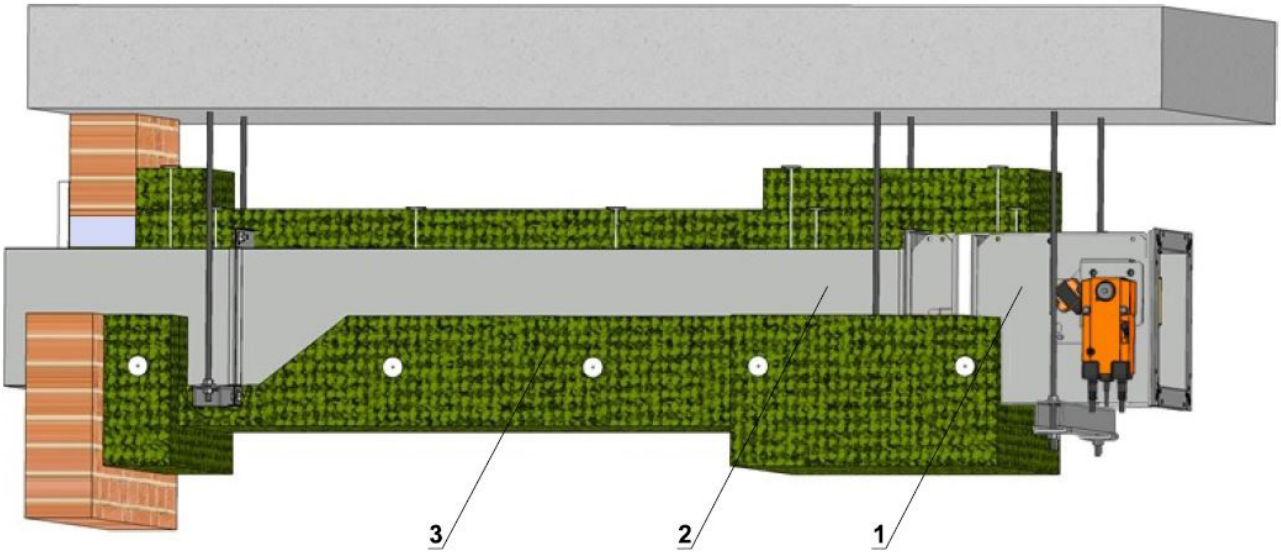
Examples of using materials:
HILTI, SIKLA, MÜPRO etc.

Shown schemes of incorporation and damper are illustrative only!

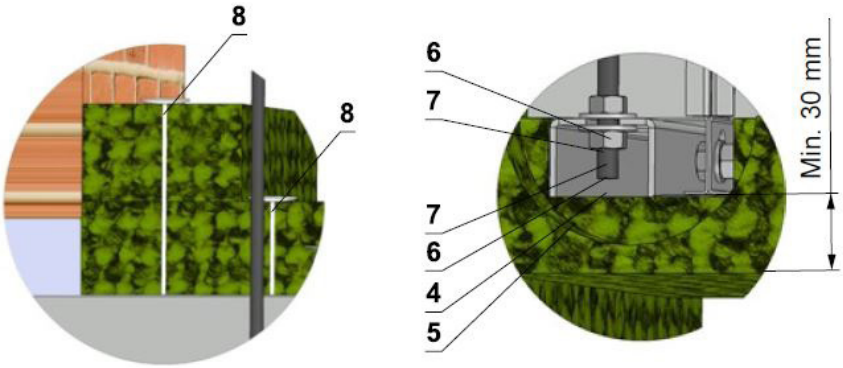
8.3 Rectangular fire damper suspension on the wall- horizontal installation

Duct between fire damper and fire separating construction can be suspended by using threaded rods and mounting profiles. Load the suspension system depend on weight of the fire damper and duct system.
Max. length between two suspension systems is 1500 mm.
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.
Threaded rods longer than 1,5 m require fire-resistant insulation.
If the threaded rod is located inside the duct insulation, distance between threaded rod and duct is max 30 mm. If the treaded rod is located outside the duct isolation,
distance between threaded
rod and isolation is max. 40 mm. Thickness of the insulation under mounting profile must be min. 30 mm.
Threaded rod fixing to the ceiling construction - see fig. 46
The insulation boards are fastened to the duct by weld pins. Distance between weld pins, distancebetween weld pins and flanges is dependent on the materials.
For more information see documentation of insulation manufacturer.

Fig. 49 Rectangular fire damper suspension on the wall- horizontal installation



Insulation layers on the duct



Position:
1 Fire damper
2 Duct
3 Insulation
4 Threaded rod
5 Mounting rail
6 Nut
7 Washer
8 Weld pin

Shown schemes of incorporation and damper are illustrative only!

9. Pressure loss

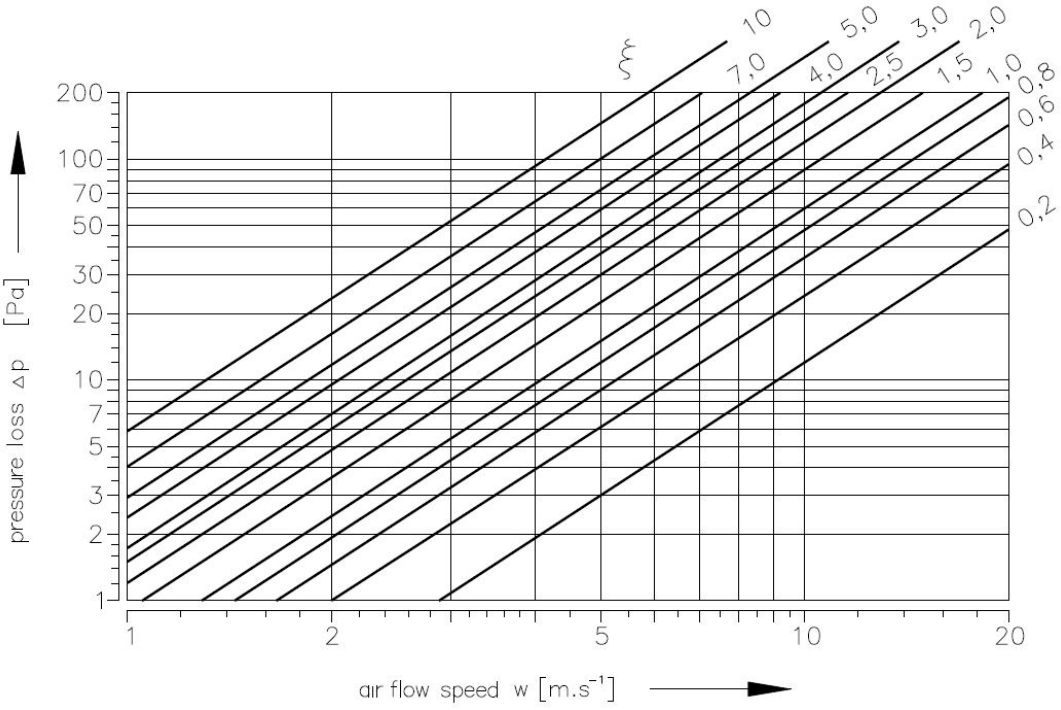
9.1 Pressure loss calculation

$$\Delta p = \xi \cdot \rho \cdot \frac{w^2}{2}$$

Δp	[Pa]	pressure loss
w	[m.s^{-1}]	air flow speed in nominal damper section
ρ	[kg.m^3]	air density
ξ	[-]	coefficient of local pressure loss for the nominal damper section (see Tab. 10.1.1.)

9.2 Determination of pressure loss by using diagram ρ = 1,2 kg.m^3

Diagram 9.2.1.Pressure losses for air density ρ = 1,2 kg.m^3



10. Coefficient of local pressure loss

10.1 Coefficient of local pressure loss ξ (-)

Tab 10.1.1. Coefficient of local pressure loss

	A													
B	**150**	**180**	**200**	**225**	**250**	**280**	**300**	**315**	**355**	**400**	**450**	**500**	**550**	**560**
150	2,742	2,575	2,399	2,320	2,219	2,105	2,047	1,954	1,885	1,811	1,753	1,703	1,686	1,665
180	2,132	1,992	1,864	1,795	1,721	1,636	1,575	1,502	1,440	1,387	1,342	1,308	1,290	1,275
200	1,691	1,580	1,477	1,417	1,363	1,288	1,244	1,186	1,136	1,094	1,059	1,030	1,017	1,005
225	1,338	1,288	1,161	1,052	1,031	1,003	0,972	0,938	0,892	0,847	0,833	0,806	0,783	0,774
250	1,118	1,042	0,969	0,934	0,902	0,852	0,807	0,776	0,741	0,715	0,691	0,673	0,661	0,655
280	1,030	0,938	0,911	0,873	0,842	0,801	0,752	0,710	0,662	0,641	0,623	0,612	0,605	0,591
300	0,954	0,868	0,821	0,789	0,754	0,710	0,668	0,621	0,594	0,582	0,551	0,543	0,538	0,535
315	0,797	0,740	0,690	0,667	0,639	0,606	0,570	0,548	0,524	0,503	0,486	0,473	0,464	0,460
355	0,685	0,638	0,595	0,568	0,545	0,518	0,492	0,472	0,450	0,433	0,418	0,406	0,399	0,395
400	0,602	0,561	0,522	0,498	0,479	0,453	0,436	0,413	0,395	0,378	0,366	0,355	0,349	0,345
450	0,538	0,500	0,465	0,446	0,429	0,408	0,384	0,367	0,351	0,337	0,325	0,315	0,313	0,307
500	0,491	0,456	0,423	0,407	0,394	0,369	0,352	0,334	0,319	0,306	0,296	0,287	0,284	0,280
550	0,470	0,436	0,404	0,388	0,374	0,352	0,330	0,313	0,304	0,288	0,277	0,275	0,267	0,264
560	0,450	0,417	0,388	0,374	0,356	0,335	0,321	0,305	0,291	0,279	0,270	0,262	0,259	0,255
600	0,423	0,394	0,370	0,354	0,342	0,321	0,304	0,290	0,278	0,271	0,260	0,249	0,244	0,235
630	0,414	0,384	0,357	0,344	0,331	0,311	0,295	0,281	0,268	0,258	0,248	0,241	0,229	0,234
650	–	0,366	0,344	0,330	0,318	0,299	0,287	0,274	0,257	0,248	0,242	0,232	0,221	0,225
700	–	0,363	0,337	0,323	0,311	0,296	0,280	0,266	0,254	0,242	0,236	0,227	0,215	0,214
710	–	0,357	0,332	0,319	0,306	0,291	0,276	0,260	0,249	0,239	0,230	0,223	0,212	0,212
750	–	0,344	0,320	0,312	0,300	0,278	0,263	0,252	0,239	0,231	0,223	0,216	0,213	0,209
800	–	0,335	0,311	0,301	0,289	0,274	0,257	0,244	0,233	0,223	0,215	0,209	0,205	0,203

	A												
B	**600**	**630**	**650**	**700**	**710**	**750**	**800**	**900**	**1000**	**1100**	**1250**	**1400**	**1500**
150	1,644	1,628	1,622	1,609	1,605	1,591	1,580	1,551	1,535	–	–	–	–
180	1,261	1,246	1,234	1,225	1,219	1,208	1,197	1,177	1,162	1,148	1,136	1,124	1,117
200	0,989	0,981	0,970	0,963	0,960	0,951	0,942	0,926	0,914	0,903	0,892	0,884	0,878
225	0,768	0,757	0,739	0,732	0,724	0,718	0,712	0,699	0,690	0,681	0,666	0,654	0,650
250	0,649	0,639	0,631	0,630	0,625	0,620	0,613	0,602	0,595	0,587	0,580	0,574	0,571
280	0,586	0,583	0,561	0,556	0,551	0,546	0,539	0,532	0,524	0,512	0,499	0,491	0,482
300	0,522	0,508	0,504	0,503	0,502	0,496	0,488	0,480	0,465	0,455	0,449	0,447	0,440
315	0,454	0,449	0,443	0,441	0,439	0,433	0,430	0,423	0,417	0,412	0,407	0,402	0,400
355	0,391	0,386	0,380	0,378	0,377	0,372	0,370	0,363	0,358	0,353	0,349	0,345	0,343
400	0,342	0,337	0,331	0,330	0,329	0,325	0,323	0,316	0,312	0,308	0,305	0,302	0,299
450	0,303	0,299	0,295	0,294	0,293	0,290	0,286	0,281	0,278	0,274	0,271	0,267	0,266
500	0,275	0,272	0,271	0,268	0,266	0,263	0,261	0,256	0,252	0,249	0,246	0,244	0,242
550	0,261	0,258	0,253	0,248	0,246	0,244	0,243	0,238	0,235	0,232	0,227	0,224	0,223
560	0,253	0,249	0,246	0,245	0,243	0,240	0,238	0,234	0,230	0,227	0,224	0,222	0,221
600	0,233	0,232	0,230	0,229	0,228	0,224	0,220	0,218	0,214	0,211	0,208	0,206	0,204
630	0,232	0,229	0,226	0,225	0,224	0,221	0,218	0,215	0,212	0,209	0,206	0,204	0,202
650	0,222	0,219	0,217	0,215	0,214	0,212	0,209	0,203	0,201	0,199	0,194	0,191	0,189
700	0,212	0,212	0,211	0,210	0,208	0,206	0,204	0,201	0,198	0,196	0,193	0,190	0,188
710	0,210	0,210	0,209	0,208	0,207	0,205	0,203	0,199	0,195	0,193	0,191	0,189	0,187
750	0,205	0,202	0,200	0,199	0,198	0,197	0,195	0,191	0,187	0,184	0,182	0,180	0,178
800	0,200	0,198	0,196	0,195	0,194	0,192	0,189	0,186	0,183	0,181	0,178	0,177	0,176

11. Noise data

11.1 Level of acoustic output corrected with filter A.

$L_{WA} = L_{W1} + 10 \log(S) + K_A$

L_{WA}	[dB(A)]	level of acoustic output corrected with filter A
L_{W1}	[dB]	level of acoustic output L_{WA} related to the 1 m² section (see Tab. 11.3.1.)
S	[m²]	duct cross section
K_A	[dB]	correction to the weight filter A (viz Tab. 11.3.4.)

11.2 Level of acoustic output in octave ranges.

$L_{Woct} = L_{W1} + 10 \log(S) + L_{rel}$

L_{Woct}	[dB]	level of acoustic output corrected with filter A
L_{W1}	[dB]	level of acoustic output L_{WA} related to the 1 m² section (see Tab. 11.3.1.)
S	[m²]	duct cross section
L_{rel}	[dB]	correction to the weight filter A (viz Tab. 11.3.4.)

11.3 Table of acoustics values

Tab 11.3.1.Level of accoustic output L_{w1} [dB] related to the 1 m² section

v [m/s]	ξ [-]																
	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1	1,5	2	2,5	3	4	5	8	10
2	15,5	18,7	20,9	22,6	24	25,2	26,3	27,2	28	31,2	33,4	35,1	36,5	38,8	40,5	44,2	45,9
3	26,1	29,2	31,5	33,2	34,6	35,8	36,9	37,8	38,6	41,7	44	45,7	47,1	49,4	51,1	54,7	56,5
4	33,6	36,7	39	40,7	42,1	43,3	44,3	45,3	46,1	49,2	51,5	53,2	54,6	56,9	58,6	62,2	64,0
5	39,4	42,5	44,8	46,5	47,9	49,1	50,2	51,1	51,9	55	57,3	59	60,4	62,7	64,4	68,0	69,8
6	44,1	47,3	49,5	51,3	52,7	53,9	54,9	55,8	56,6	59,8	62	63,8	65,2	67,4	69,2	72,8	74,5
7	48,2	51,3	53,5	55,3	56,7	57,9	58,9	59,8	60,7	63,8	66,1	67,8	69,2	71,4	73,2	76,8	78,6
8	51,6	54,8	57	58,8	60,2	61,4	62,4	63,3	64,1	67,3	69,5	71,3	72,7	74,9	76,7	80,3	82,0
9	54,7	57,9	60,1	61,8	63,2	64,4	65,5	66,4	67,2	70,4	72,6	74,3	75,7	78	79,7	83,4	85,1
10	57,4	60,6	62,8	64,6	66	67,2	68,2	69,1	70	73,1	75,3	77,1	78,5	80,7	82,5	86,1	87,9
11	59,9	63,1	65,3	67,1	68,5	69,7	70,7	71,6	72,4	75,6	77,8	79,6	81	83,2	85	88,6	90,3
12	62,2	65,4	67,6	69,3	70,7	71,9	73	73,9	74,7	77,9	80,1	81,8	83,2	85,5	87,2	90,9	92,6

Tab 11.3.2. Correction to the weight filter A

v [m/s]	2	3	4	5	6	7	8	9	10	11	12
[dB]	-15,0	-11,8	-9,8	-8,4	-7,3	-6,4	-5,7	-5,0	-4,5	-4,0	-3,6

Tab 11.3.3. Relative level expressing the shape of the spectrum L_{rel}

v [m/s]	f [Hz]							
	63	125	250	500	1000	2000	4000	8000
2	-4,5	-6,9	-10,9	-16,7	-24,1	-33,2	-43,9	-56,4
3	-3,9	-5,3	-8,4	-13,1	-19,5	-27,6	-37,4	-48,9
4	-3,9	-4,5	-6,9	-10,9	-16,7	-24,1	-33,2	-43,9
5	-4,0	-4,1	-5,9	-9,4	-14,6	-21,5	-30	-40,3
6	-4,2	-3,9	-5,3	-8,4	-13,1	-19,5	-27,6	-37,4
7	-4,5	-3,9	-4,9	-7,5	-11,9	-17,9	-25,7	-35,1
8	-4,9	-3,9	-4,5	-6,9	-10,9	-16,7	-24,1	-33,2
9	-5,2	-3,9	-4,3	-6,4	-10,1	-15,6	-22,7	-31,5
10	-5,5	-4	-4,1	-5,9	-9,4	-14,6	-21,5	-30
11	-5,9	-4,1	-4	-5,6	-8,9	-13,8	-20,4	-28,8
12	-6,2	-4,3	-3,9	-5,3	-8,4	-13,1	-19,5	-27,6

Material, finishing

12. Material

12.1 Damper bodies are supplied in the design made of galvanized plate without any other surface finishing. Damper blades are made of fire resistant asbestos free boards made of mineral fibres. Control devices of dampers has cover from mechanically resistant and standing plastic and rest of the parts is galvanised without further surface treatment.
Springs are galvanized.
Thermal protective fuses are made of sheet brass, thickness = 0.5 mm.
Fasteners is galvanized. Fasteners is galvanized.

12.2 According to the customer's requirements, damper can be made of stainless material.
Specifications for stainless-steel models – classification of stainless steel:

- Class A2 – Food-grade stainless steel (AISI 304 – EN 17240)
- Class A4 – Chemistry-grade stainless steel (AISI 316, 316L – EN 17346, 17349)

The respective stainless steel is the material for all components present or accessing the damper interior; components outside the damper body are typically from galvanised sheet metal (fasteners for mounting the servo drive or mechanics, mechanics components except Item 4), frame components.

The following components, including the fasteners, are made from stainless steel at all times:
1) Damper body and all components permanently attached
2) Leaf holders, including pins, metal parts of leaf
3) Control components inside the damper (leaf angle selector, pin with lever)
4) Mechanical components entering the interior of damper body (lower sheet of mechanics, lock holder “1”, lock lever “2”, lock spring, 8 dia. stopper pin, mechanics pin)
5) Inspection hole cover including the clip and fasteners (if they are parts of the cover)
6) Bearing for torque transfer from the lever with pin on the angle selector at the leaf (made from AISI 440C)

The leaf of the damper is made from a single piece of homogeneous material Promatect-MST, thickness 40 mm.
Plastic, rubber and silicon components, sealants, foaming bands, glass-ceramic seals, housings, brass bearings of the leaf, servo drives, and end switches are identical for all material variants of the dampers.
The thermal link is identical for all material variants of the dampers. Upon specification by customer, the thermal link may be made from A4 stainless steel. The solder is standard, corresponding to the initialisation temperature.
The temperature-dependent initiator of the servo drive (sensor) is modified for stainless-steel

variants of the dampers; the standard galvanised screws are replaced with stainless-steel M4 screws of corresponding class the counterpart has stainless-steel riveting M4 nuts.
Some fasteners and components are available in one class of stainless steel; the type will be used in all stainless-steel variants. The leaf in the variants for chemical environments (Class A4) is always treated with a coating of chemically resistant Promat SR.
Any other requirements for the design shall be considered atypical and shall be addressed on an individual basis.

Inspection, testing

13. Inspection, testing

13.1 The appliance is constructed and preset by the manufacturer, its operation is dependent on proper installation and adjustment.

Transportation and storage

14. Logistic terms

14.1 The dampers are delivered as bulk cargo. Any other packing methods must be agreed with the manufacturer in advance. The potential packages will be considered non-returnable and their price will not be included in the product price.
The dampers are transported by box freight vehicles; no sharp shocks must occur and the ambient temperature must not exceed +40°C. For handling during transport, the dampers must be protected against mechanical damages and weather impact. If the customer wishes it, the dampers can be transported on pallets. During transport, the damper blade must be in the "CLOSED" position.
Unless another method of reception is specified in the purchase order, the handover of the dampers to the forwarder shall be understood as reception.

14.2 The dampers must be stored in covered buildings, in an environment without aggressive vapours, gases and dust. A temperature in a range of -5°C and +40°C and a relative humidity of max. 80%
must be maintained in the buildings. For handling during storage, the dampers must be protected against mechanical damage.

14.3 The delivery includes the complete damper and the delivery note.

15. Warranty

15.1 The warranty for fire dampers FDMQ, provided by the manufacturer, shall become completely null and void if the starting, closing and control devices are unprofessionally handled by untrained workers or if electric components, i.e. limit switches, actuating mechanisms, communication and supply devices and thermoelectric starting mechanisms are dismounted. The warranty shall also become null and void if the dampers are used for other purposes, devices and working conditions than those allowed by these technical conditions or if the dampers are mechanically damaged during handling.

15.2 If the dampers are damaged by transport, a record must be written down with the forwarder at reception for later complaint.

Assembly, attendance, maintenance and revisions

16. Assembly

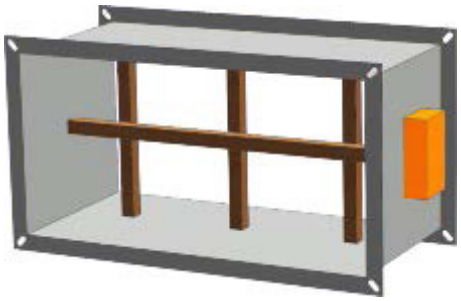
16.1 The assembly of the dampers must be carried out while observing all applicable safety standards and regulations.

16.2 The damper body should not be deformed in the course of bricking in. Once the damper is builtin, its blade should not grind on the damper body during opening or closing.

Fig. 50 Embedding/ fixing the damper

**Protecting the damper against buckling,
above all when there are big sizes of the fire dampers!**

WRONG!



Brace with wooden blocks

16.3 All flange and screw joints must be conductively connected during the assembly to provide protection against dangerous contact. 2 fan-shaped washers in galvanized version are to be used for conductive connection; they are to be situated under the head of one bolt and under the screwed nut.

16.4 If the damper is equipped with limit switches and the said devices are not used during operation (e.g. because of a project change), they can be left on the damper and not connected (they need not be dismounted). On the other hand, if a limit switch is to be added to the damper design, the change can be implemented by adding the required device to the base plate of the damper. The said facts must be recorded in the respective operation documentation of the damper (record books of the damper, fire logs, etc.) and subsequently, adequate function checks must be carried out.

16.5 For a reliable function of the dampers, their closing mechanism and the seating faces of the blade must be protected from dust, fibrous or adhesive masses and solvents.

16.6 Control of actuating mechanism without electric voltage:
You can set the damper blade in any position with the help of a special wrench (included in the delivery of the actuating mechanism). By turning the wrench in the direction of the arrow, the damper blade will move to the open position. By stopping the damper blade in any position, the actuating mechanism will be locked according to the instructions on the actuating mechanism. The mechanism can be unlocked manually according to the instructions on the mechanism or by means of supply voltage.

WARNING!
If the actuating mechanism is manually locked, the damper blade will not close in case of fire after activation of the thermoelectric starting mechanism BAT. To restore the correct function of the damper, the actuating mechanism must be unlocked (manually or by means of supply voltage).

17. Entry into service and revisions

17.1 Before entering the dampers into operation after their assembly and by sequential checks, the following checks must be carried out. Visual inspection of proper damper integration , inside damper area, damper blade, contact surfaces and silicon sealing. Check of thermal protective fuse and closing mechanism. Check the closing function of the damper blade. This can be done by removing of thermal fuse from damper body.
Before entering the dampers with actuating mechanism into operation after their assembly and by sequential checks. 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). 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. It is recommended to provide periodical checks, maintenance and service actions on Fire Equipment by Authorized persons.
The authorized persons can be trained by Producer, or by authorized Distributor. All effective safety standards and directives must be observed during fire damper assembly.
For regular or exceptional inspection of interior of fire damper, micro-camera device can be used. On each fire damper is ispection hole. In the case of inspection by camera, take out the black rubber cap, insert the camera inside the damper, check interior and at the end of inspection, put the rubber cap back tightly to cover the empty hole.

17.2 Before entering the dampers with manual control (design .01, .11, .80) into operation after their assembly and by sequential checks and following checks must be carried out.

Verification of closing device and thermal fuse:
When you verify functionality of mechanism, follow these steps:

Adjustment of damper blade in position "CLOSED" shall be made following:
- Damper is in „OPEN“ position.
- By pressing control button mechanism, you close damper in "CLOSED" position.
- Check damper blade adjustment in "CLOSED" position.
- Closing must be strong and control lever must be in "CLOSED" position.
- If closing is not sufficiently strong and damper control lever is not in "CLOSED" position, you must contact manufacturer and order new mechanism.
- Mechanism dimension is marked M1 to M5, according to internal forces of spring.

Adjustment of damper blade in position "OPEN" shall be made following:
- Rotate control lever by 90°.
- Lever get fasten automatically in “OPEN” position.
- Check damper blade adjustment in "OPEN" position.

Checking function and the status of the thermal fuse shall be made following:

- 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.
- There must be a release lever, which releases initiation lever of control and mechanism will displace to "CLOSED" position.
- If not, you need to contact the manufacturer and order new mechanism.
- Mechanism dimension is marked M1 to M5, according to internal forces of spring.

17.3 For the designs with actuating mechanisms, the following checks must be carried out:
Check the shift of the blade to "CLOSED" failure position after cutting off the power supply to the actuating mechanism (e.g. by pressing the reset button on the thermoelectric starting mechanism BAT, by cutting off the power supply from electrical fire signalization). Check the shift of the blade

back to "OPEN" position by restoring the power supply to the actuating mechanism (e.g. by releasing the reset button, by restoring the power supply from electrical fire signalization).

17.4 The check of function of the damper with actuating mechanism can be carried out as follows:
a) by cutting off and restoring the power supply, e.g. by a signal from electrical fire signalization
b) directly on the installed damper, with the help of the button on the thermoelectric starting mechanism BAT (simulating fuse tripping).

17.5 Before putting the dampers into operation and during subsequent function checks, the following checks must be carried out for dampers with optical smoke detector.
The function checks of the optical smoke detector are to be carried out by employees of an authorized organization who have corresponding electrotechnical qualification and have been provably trained by the manufacturer. The function checks are to be carried out as a part of function checks of the fire dampers, at least 1x a year.

17.6 For the function checks, the dampers should be moved to "CLOSED" position with the fan off or with closed regulation valve situated between the fan and the fire damper.

18. Spare parts

18.1 Spare parts are supplied only on basis of an order.

18.2 Control for square damper and round damper is identical.

19. Restore function of actuating mechanism after fuses initiation

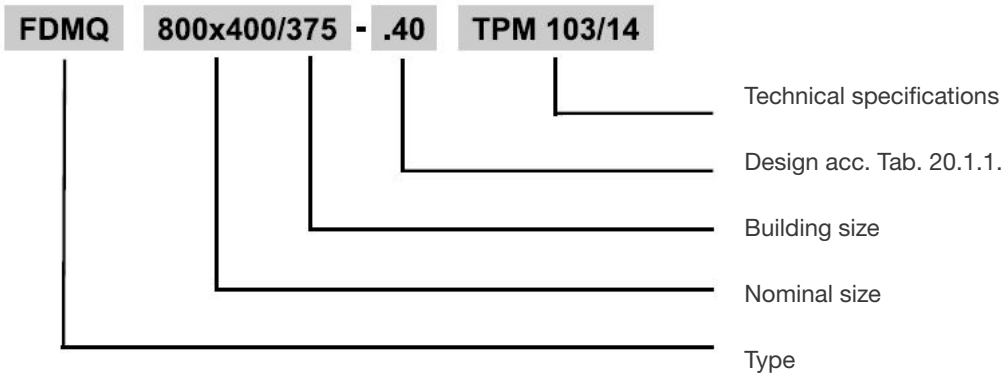
If fuse Tf1 is initiated (duct outside temperature) than is necessary to change thermoelectrical starting mechanism BAT72B-S. Whereas is initiation temperature higher than actuator mechanism operating temperature +50°C, recommended actuating mechanism manufacturer make complete revision or change actuating mechanism and thermoelectrical starting mechanism.

If fuses Tf2/Tf3 are initiated (duct inside temperature) than is possible change only part ZBAT72 or ZBAT95 (according initiating temperature).

Ordering information

20. Ordering key

20.1 Fire damper



If installation holders, installation frame or design for installation in Weichschott system are requested, it has to be mentioned separately in the order. Installation frame could be fixed to the damper body or supplied separately.

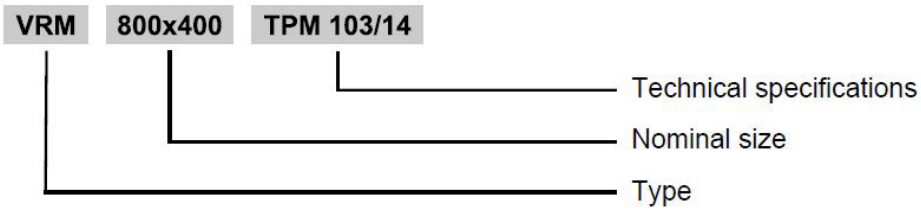
Tab 20.1.1. Dampers design

Dampers design	Additional digit
Manual and thermal	.01
Manual and thermal (ATEX, zone 1,2)	.02
Manual and thermal with a terminal switch („CLOSED“)	.11
Manual and thermal with a terminal switch („CLOSED“) (ATEX zone 1,2)	.12
With actuating mechanism BF 230-TN (BFL, BFN 230-T) - voltage AC 230 V	.40
With actuating mechanism ExMax-15-BF (AC 230 V, AC/DC 24 V) with thermoelectric activation mechanism (ATEX zone 1,2)	.42
With actuating mechanism BF 24-TN (BFL, BFN 24-T) - voltage AC/DC 24 V	.50
Manual and thermal with two terminal switches („OPEN“, „CLOSED“)	.80

20.2 Reinforcement - damper placement outside wall or ceiling construction

21. Data label

21.1 Data label is placed on the damper body.



Product data

MANDÍK®
MANDÍK, a.s.
Dobříšská 550, 267 24 Hostomice, Czech Republic

FIRE DAMPER - FDMQ			
DIMENSION:		ACTUATING SYSTEM:	
YEAR/SER.NO.:		WEIGHT (kg):	

MANUAL

FIRE PROTEC. CLASS: **EI 90 (ve ho i ↔ o) S**

TPM 103/14	Cert. No.: 1391-CPR-2021/0144, DoP: PM/FDMQ/01/21/3	EN 15650:2010

CE 1391

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