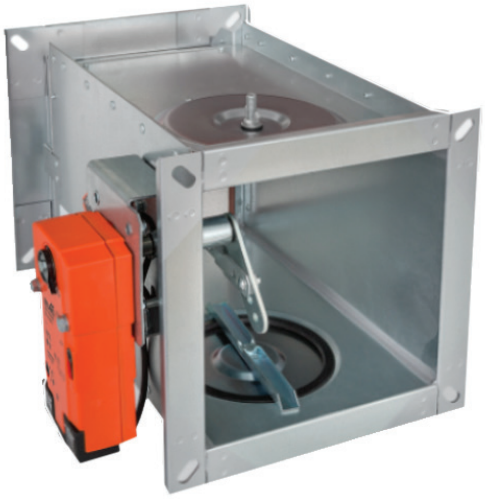


NORDfire

FDMB Fire Damper

- Square dampers from 160×160 mm to 0,5 m2 (max. dimensions 1000×500 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

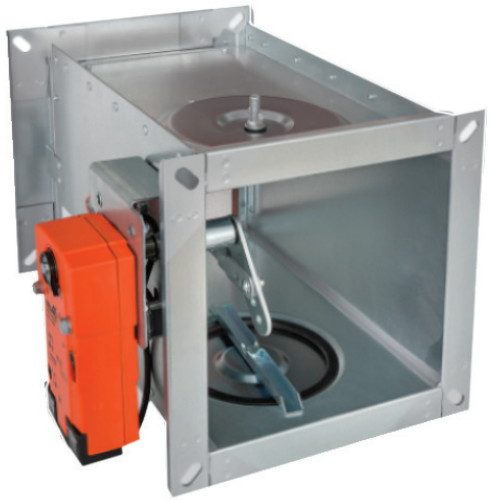
ETS NORD

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 an electrical actuating mechanism.. 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 FDMB with actuating mechanism



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-2020/0003
- Declaration of Performance No. PM/FDMQ/01/20/1
- 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 -30°C to +50°C.

2. Design

2.1 Design with actuating mechanism

Design .40, .50

The damper are equipped by Belimo actuators with spring return and thermoelectric activation device of BFL, BFN or BF depending on the damper size (furher mentioned as „actuators“). 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

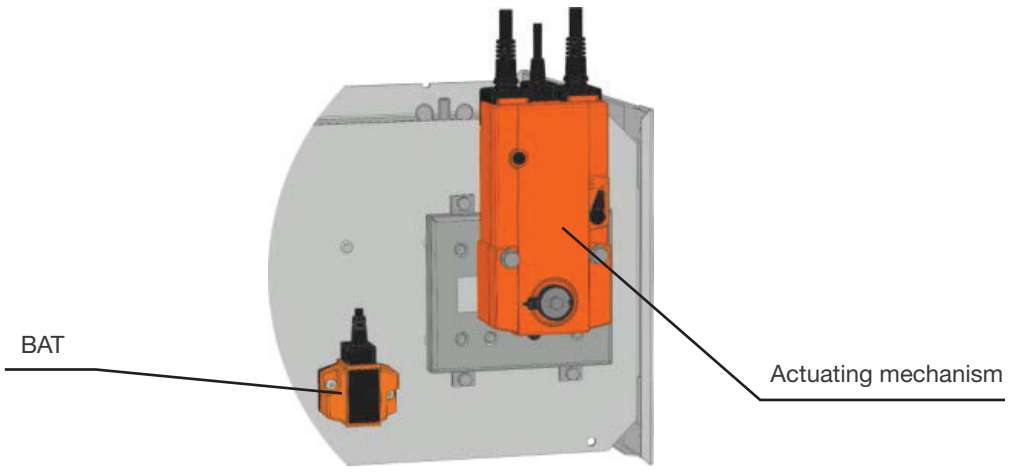


Fig. 9 Actuating mechanism BELIMO BFL BFL (BFN) 230-T

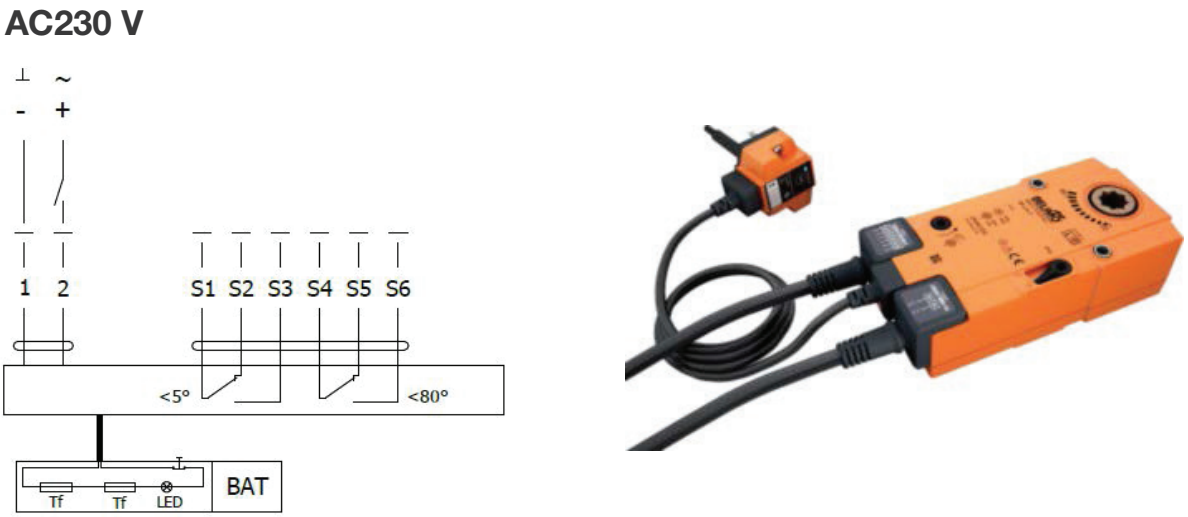
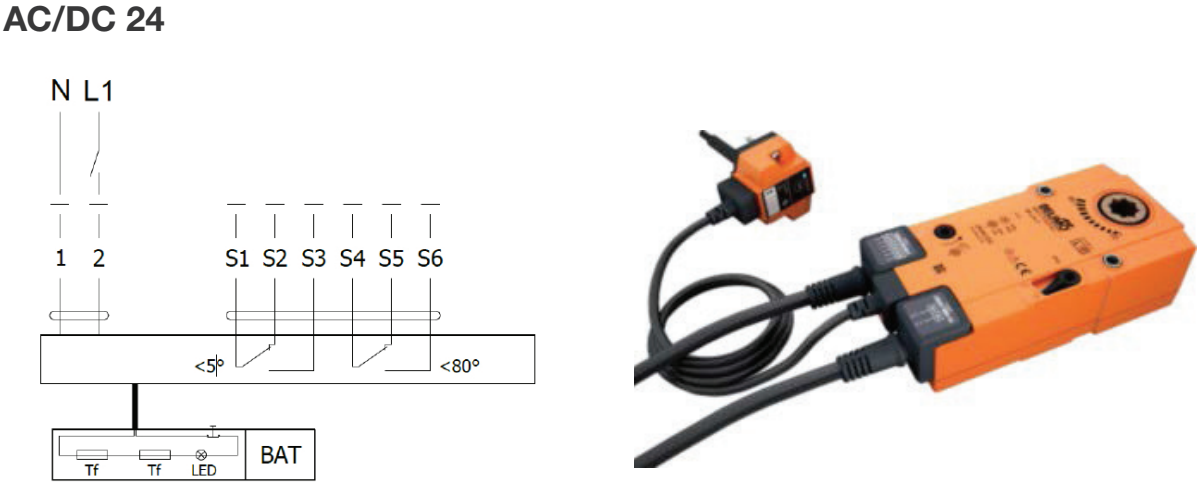


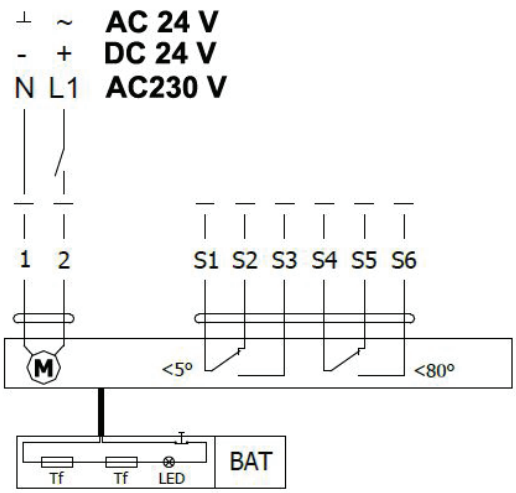
Fig. 10 Actuating mechanism BELIMO BFL BFL (BFN) 230-T



Tab 2.1.1. Actuating mechanism BELIMO BFL24-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



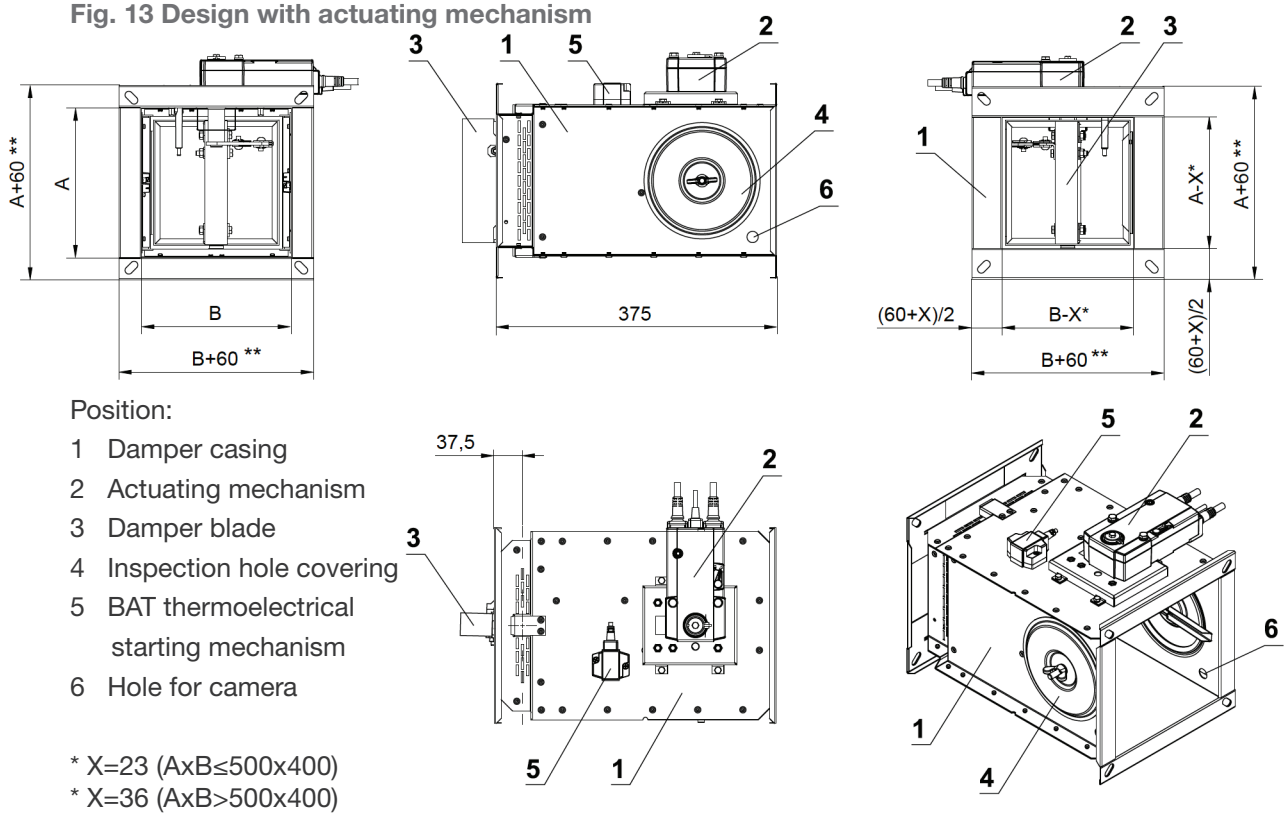
Tab 2.1.2. Actuating mechanism BELIMO BFL24-TN(-ST), BF 230-TN

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 mm² cable 1 m, 6 x 0,75 mm² (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. 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

* X=23 (AxB≤500x400)
* X=36 (AxB>500x400)

3.2 Dimensions, weights and effective area

Tab 3.2.1. Dimensions, weights and effective area

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.
			mech [kg]	servo [kg]		
160 x 160	-	20	5,5	7,0	0,0113	BFL
x 180	-	30	6,0	7,5	0,0137	BFL
x 200	-	40	6,0	7,5	0,0161	BFL
x 225	-	52,5	6,5	8,0	0,0191	BFL
x 250	-	65	7,0	8,5	0,0222	BFL
x 280	-	80	7,0	8,5	0,0258	BFL
x 300	-	90,0	7,5	9,0	0,0282	BFL
x 315	-	97,5	7,5	9,0	0,0300	BFL
x 355	-	117,5	8,5	10,0	0,0349	BFL
x 400	-	140	9,0	10,5	0,0403	BFL
x 450	-	165	9,5	11,5	0,0392	BFL
x 500	-	190	10,0	13,0	0,0446	BFL
x 550	-	215	10,5	13,5	0,0500	BFL
x 560	-	220	10,5	13,5	0,0511	BFL
x 600	-	240	11,0	14,0	0,0554	BFL
x 630	-	255	11,5	14,5	0,0586	BFL
x 650	-	265	11,5	14,5	0,0608	BFL
x 700	-	290	12,5	15,5	0,0662	BFL
x 710	-	295	12,5	15,5	0,0673	BFL
x 750	15	315	13,0	16,0	0,0716	BFN
x 800	40	340	13,5	16,5	0,0770	BFN
x 900	90	390	14,5	17,5	0,0878	BFN
x 1000	140	440	20,0	23,0	0,0986	BFN
180 x 160	-	20	6,0	7,5	0,0131	BFL
x 180	-	30	6,0	7,5	0,0159	BFL
x 200	-	40	6,5	8,0	0,0187	BFL
x 225	-	52,5	6,5	8,0	0,0222	BFL
x 250	-	65,0	7,0	8,5	0,0258	BFL
x 280	-	80	7,5	9,0	0,0300	BFL
x 300	-	90	7,5	9,0	0,0328	BFL
x 315	-	97,5	8,0	9,5	0,0349	BFL
x 355	-	117,5	8,5	10,5	0,0406	BFL
x 400	-	140	9,0	11,0	0,0469	BFL
x 450	-	165	10,0	13,0	0,0465	BFL
x 500	-	190	10,5	13,5	0,0529	BFL
x 550	-	215	11,0	14,0	0,0593	BFL
x 560	-	220	11,0	14,0	0,0605	BFL
x 600	-	240	11,5	14,5	0,0657	BFL
x 630	-	255	12,0	15,0	0,0695	BFL
x 650	-	265	12,0	15,0	0,0721	BFL
x 700	-	290	13,0	16,0	0,0785	BFN
x 710	-	295	13,0	16,0	0,0797	BFN
x 750	15	315	13,5	16,5	0,0849	BFN
x 800	40	340	14,0	17,0	0,0913	BFN
x 900	90	390	15,0	18,0	0,1041	BFN
x 1000	140	440	20,5	23,5	0,1169	BFN
200 x 160	-	20,0	6,0	7,5	0,0149	BFL
x 180	-	30,0	6,5	8,0	0,0181	BFL
x 200	-	40	6,5	8,0	0,0213	BFL
x 225	-	52,5	7,0	8,5	0,0253	BFL
x 250	-	65	7,5	9,0	0,0294	BFL
x 280	-	80	7,5	9,0	0,0342	BFL
x 300	-	90	8,0	9,5	0,0374	BFL

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.
			mech [kg]	servo [kg]		
200 x 315	-	97,5	8,0	9,5	0,0398	BFL
x 355	-	117,5	9,0	10,5	0,0463	BFL
x 400	-	140	9,5	11,0	0,0535	BFL
x 450	-	165	10,0	13,0	0,0537	BFL
x 500	-	190	10,5	13,5	0,0611	BFL
x 550	-	215	11,5	14,5	0,0685	BFL
x 560	-	220	11,5	14,5	0,0700	BFL
x 600	-	240	12,0	15,0	0,0759	BFL
x 630	-	255	12,5	15,5	0,0804	BFL
x 650	-	265	12,5	15,5	0,0833	BFL
x 700	-	290	13,0	16,0	0,0907	BFN
x 710	-	295	13,5	16,5	0,0922	BFN
x 750	15	315	14,0	17,0	0,0981	BFN
x 800	40	340	14,5	17,5	0,1055	BFN
x 900	90	390	15,5	18,5	0,1203	BFN
x 1000	140	440	17,0	20,0	0,1351	BFN
225 x 160	-	20	6,5	8,0	0,0171	BFL
x 180	-	30	7,0	8,5	0,0209	BFL
x 200	-	40	7,5	9,0	0,0246	BFL
x 225	-	52,5	8,0	9,5	0,0292	BFL
x 250	-	65	8,5	10,0	0,0339	BFL
x 280	-	80	9,0	10,5	0,0395	BFL
x 300	-	90	9,5	11,0	0,0432	BFL
x 315	-	97,5	9,5	11,0	0,0460	BFL
x 355	-	117,5	10,0	11,0	0,0534	BFL
x 400	-	140	10,5	11,5	0,0618	BFL
x 450	-	165	11,5	12,0	0,0628	BFL
x 500	-	190	12,5	13,0	0,0714	BFL
x 550	-	215	13,5	14,0	0,0801	BFL
x 560	-	220	13,5	15,0	0,0818	BFL
x 600	-	240	14,0	15,5	0,0887	BFL
x 630	-	255	14,5	16,0	0,0939	BFN
x 650	-	265	15,0	16,5	0,0974	BFN
x 700	-	290	16,0	17,5	0,1060	BFN
x 710	-	295	16,0	17,5	0,1078	BFN
x 750	15	315	16,5	18,0	0,1147	BFN
x 800	40	340	17,5	19,0	0,1233	BFN
x 900	90	390	19,0	22,0	0,1406	BFN
x 1000	140	440	20,5	23,5	0,1579	BF
250 x 160	-	20	6,5	8,0	0,0194	BFL
x 180	-	30	7,0	8,5	0,0236	BFL
x 200	-	40	7,0	8,5	0,0278	BFL
x 225	-	52,5	7,5	9,0	0,0331	BFL
x 250	-	65	8,0	9,5	0,0384	BFL
x 280	-	80	8,5	10,0	0,0447	BFL
x 300	-	90	8,5	10,0	0,0489	BFL
x 315	-	97,5	9,0	10,5	0,0521	BFL
x 355	-	117,5	9,5	11,5	0,0605	BFL
x 400	-	140	10,5	12,0	0,0700	BFL
x 450	-	165	11,0	14,0	0,0719	BFL
x 500	-	190	11,5	14,5	0,0818	BFL
x 550	-	215	12,5	15,5	0,0917	BFL
x 560	-	220	12,5	15,5	0,0937	BFL

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.
			mech [kg]	servo [kg]		
400 x 500	-	190	14,5	17,5	0,1437	BFL
x 550	-	215	15,5	18,5	0,1611	BFL
x 560	-	220	15,5	18,5	0,1646	BFL
x 600	-	240	16,0	19,0	0,0685	BFL
x 630	-	255	16,5	19,5	0,1785	BFL
x 650	-	265	17,0	20,0	0,1890	BFL
x 700	-	290	18,0	21,0	0,1959	BFL
x 710	-	295	18,0	21,0	0,2133	BFL
x 750	-	315	18,5	21,5	0,2168	BFN
x 800	15	340	19,5	22,5	0,2307	BFN
x 900	90	390	21,0	24,0	0,2481	BFN
x 1000	140	440	23,0	26,0	0,3177	BFN
450 x 160	-	20	9,0	10,5	0,0374	BFL
x 180	-	30	9,0	10,5	0,0456	BFL
x 200	-	40	9,5	11,0	0,0538	BFL
x 225	-	52,5	10,0	11,5	0,0641	BFL
x 250	-	65	10,5	12,0	0,0744	BFL
x 280	-	80	11,0	12,5	0,0867	BFL
x 300	-	90	11,5	13,0	0,0949	BFL
x 315	-	97,5	11,5	13,5	0,1011	BFL
x 355	-	117,5	13,0	14,5	0,1175	BFL
x 400	-	140	13,5	15,0	0,1360	BFL
x 450	-	165	14,5	17,5	0,1445	BFL
x 500	-	190	15,5	18,5	0,1644	BFL
x 550	-	215	16,5	19,5	0,1843	BFL
x 560	-	220	16,5	19,5	0,1883	BFL
x 600	-	240	17,0	20,0	0,2042	BFL
x 630	-	255	17,5	20,5	0,2161	BFN
x 650	-	265	18,0	21,0	0,2241	BFN
x 700	-	290	19,0	22,0	0,2440	BFN
x 710	-	295	19,0	22,0	0,2480	BFN
x 750	15	315	20,5	23,0	0,2639	BFN
x 800	40	340	22,5	23,5	0,2838	BFN
x 900	90	390	22,5	25,5	0,3236	BFN
x 1000	140	440	24,0	27,0	0,3634	BF
500 x 160	-	20	9,5	11,0	0,0419	BFL
x 180	-	30	9,5	11,5	0,0511	BFL
x 200	-	40	10,0	11,5	0,0603	BFL
x 225	-	52,5	10,5	12,5	0,0718	BFL
x 250	-	65	11,0	13,0	0,0834	BFL
x 280	-	80	11,5	13,5	0,0972	BFL
x 300	-	90	12,0	13,5	0,1064	BFL
x 315	-	97,5	12,5	14,0	0,1133	BFL
x 355	-	117,5	13,5	15,0	0,1318	BFL
x 400	-	140	14,5	16,0	0,1525	BFL
x 450	-	165	15,5	18,5	0,1626	BFL
x 500	-	190	16,5	19,5	0,1850	BFL
x 550	-	215	17,0	20,0	0,2074	BFL
x 560	-	220	17,5	20,5	0,2119	BFL
x 600	-	240	18,0	21,0	0,2298	BFN
x 630	-	255	19,0	22,0	0,2433	BFN
x 650	-	265	19,0	22,0	0,2522	BF
x 700	-	290	20,0	23,0	0,2746	BF
x 710	-	295	20,5	23,5	0,2791	BF

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.
			mech [kg]	servo [kg]		
500 x 750	15	315	21,0	24,0	0,2970	BF
x 800	40	340	22,0	25,0	0,3194	BF
x 900	90	390	24,0	27,0	0,3642	BF
x 1000	140	440	25,5	28,5	0,4090	BF
550 x 160	-	20	10,0	13,0	0,0364	BFL
x 180	-	30	10,5	13,5	0,0463	BFL
x 200	-	40	10,5	13,5	0,0563	BFL
x 225	-	52,5	11,0	14,0	0,0687	BFL
x 250	-	65	12,0	15,0	0,0812	BFL
x 280	-	80	12,5	15,5	0,0961	BFL
x 300	-	90	13,0	16,0	0,1061	BFL
x 315	-	97,5	13,0	17,5	0,1135	BFL
x 355	-	117,5	14,5	18,0	0,1335	BFL
x 400	-	140	15,0	19,0	0,1559	BFL
x 450	-	165	16,0	20,0	0,1808	BFL
x 500	-	190	17,0	21,0	0,2057	BFL
x 550	-	215	18,0	21,5	0,2306	BFL
x 560	-	220	18,5	21,0	0,2356	BFL
x 600	-	240	19,0	22,0	0,2555	BFL
x 630	-	255	20,0	23,0	0,2704	BFN
x 650	-	265	20,0	23,0	0,2804	BFN
x 700	-	290	21,5	24,5	0,3053	BFN
x 710	-	295	21,5	24,5	0,3103	BFN
x 750	15	315	22,0	25,0	0,3302	BFN
x 800	40	340	23,0	26,0	0,3551	BFN
x 900	90	390	25,0	28,0	0,4049	BFN
560 x 160	-	20	10,0	13,0	0,0371	BFL
x 180	-	30	9,5	11,5	0,0472	BFL
x 200	-	40	10,0	11,5	0,0574	BFL
x 225	-	52,5	10,5	12,5	0,0701	BFL
x 250	-	65	11,0	13,0	0,0828	BFL
x 280	-	80	11,5	13,5	0,0980	BFL
x 300	-	90	12,0	13,5	0,1082	BFL
x 315	-	97,5	12,5	14,0	0,1158	BFL
x 355	-	117,5	13,5	15,0	0,1361	BFL
x 400	-	140	14,5	16,0	0,1590	BFL
x 450	-	165	15,5	18,5	0,1844	BFL
x 500	-	190	16,5	19,5	0,2098	BFL
x 550	-	215	17,0	20,0	0,2352	BFL
x 560	-	220	17,5	20,5	0,2403	BFL
x 600	-	240	18,0	21,0	0,2606	BFN
x 630	-	255	19,0	22,0	0,2758	BFN
x 650	-	265	19,0	22,0	0,2860	BF
x 700	-	290	20,0	23,0	0,3114	BF
x 710	-	295	20,5	23,5	0,3165	BF
x 750	-	315	22,5	25,5	0,3368	BF
x 800	15	340	23,5	26,5	0,3622	BF
600 x 160	40	20	10,5	13,5	0,0400	BFL
x 180	-	30	11,0	14,0	0,0510	BFL
x 200	-	40	11,0	14,0	0,0619	BFL
x 225	-	52,5	12,0	15,0	0,0756	BFL
x 250	-	65	12,5	15,5	0,0893	BFL
x 280	-	80	13,0	16,0	0,1058	BFL

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.
			mech [kg]	servo [kg]		
250 x 600	-	240	13,0	16,0	0,1016	BFN
x 630	-	255	13,5	16,5	0,1075	BFN
x 650	-	265	13,5	16,5	0,1115	BFN
x 700	-	290	14,5	17,5	0,1214	BFN
x 710	-	295	14,5	17,5	0,1234	BFN
x 750	15	315	15,0	18,0	0,1313	BFN
x 800	40	340	15,5	18,5	0,1412	BFN
x 900	90	390	17,0	20,0	0,1610	BFN
x 1000	140	440	18,5	21,5	0,1808	BF
280 x 160	-	20	7,0	8,5	0,0221	BFL
x 180	-	30	7,0	9,0	0,0269	BFL
x 200	-	40	7,5	9,0	0,0317	BFL
x 225	-	52,5	8,0	9,5	0,0377	BFL
x 250	-	65	8,5	10,0	0,0438	BFL
x 280	-	80	8,5	10,5	0,0510	BFL
x 300	-	90	9,0	10,5	0,0558	BFL
x 315	-	97,5	9,0	11,0	0,0594	BFL
x 355	-	117,5	10,0	12,0	0,0691	BFL
x 400	-	140	11,0	12,5	0,0799	BFL
x 450	-	165	11,5	14,5	0,0828	BFL
x 500	-	190	12,0	15,0	0,0942	BFL
x 550	-	215	13,0	16,0	0,1056	BFL
x 560	-	220	13,0	16,0	0,1078	BFN
x 600	-	240	13,5	16,5	0,1170	BFN
x 630	-	255	14,0	17,0	0,1238	BFN
x 650	-	265	14,5	17,5	0,1284	BFN
x 700	-	290	15,0	18,0	0,1398	BFN
x 710	-	295	15,0	18,0	0,1420	BFN
x 750	15	315	15,5	18,5	0,1512	BFN
x 800	40	340	16,5	19,5	0,1626	BFN
x 900	90	390	18,0	21,0	0,1854	BF
x 1000	140	440	23,5	26,5	0,2082	BF
300 x 160	-	20	7,0	8,5	0,0239	BFL
x 180	-	30	7,5	9,0	0,0291	BFL
x 200	-	40	7,5	9,5	0,0343	BFL
x 225	-	52,5	8,0	9,5	0,0408	BFL
x 250	-	65	8,5	10,0	0,0474	BFL
x 280	-	80	9,0	10,5	0,0552	BFL
x 300	-	90	9,5	11,0	0,0604	BFL
x 315	-	97,5	9,5	11,0	0,0643	BFL
x 355	-	117,5	10,5	12,0	0,0748	BFL
x 400	-	140	11,0	12,5	0,0865	BFL
x 450	-	165	12,0	15,0	0,0900	BFL
x 500	-	190	12,5	15,5	0,1024	BFL
x 550	-	215	13,5	16,5	0,1148	BFN
x 560	-	220	13,5	16,5	0,1173	BFN
x 600	-	240	14,0	17,0	0,1272	BFN
x 630	-	255	14,5	17,5	0,1347	BFN
x 650	-	265	14,5	17,5	0,1396	BFN
x 700	-	290	15,5	18,5	0,1520	BFN
x 710	-	295	15,5	18,5	0,1545	BFN
x 750	15	315	16,0	19,0	0,1644	BFN
x 800	40	340	17,0	20,0	0,1768	BFN
x 900	90	390	18,5	21,5	0,2016	BF
x 1000	140	440	20,0	23,0	0,2264	BF
315 x 160	-	20	8,5	10,5	0,0252	BFL

A x B [mm]	a [mm]	c [mm]	weight design		effect.area Sef. [m²]	Actu. mech.
			mech [kg]	servo [kg]		
315 x 180	-	30	9,0	10,5	0,0308	BFL
x 200	-	40	9,5	11,0	0,0363	BFL
x 225	-	52,5	9,5	11,5	0,0432	BFL
x 250	-	65	10,0	12,0	0,0501	BFL
x 280	-	80	10,5	12,0	0,0584	BFL
x 300	-	90	11,0	12,5	0,0639	BFL
x 315	-	97,5	11,5	13,0	0,0680	BFL
x 355	-	117,5	12,0	13,5	0,0791	BFL
x 400	-	140	13,0	14,5	0,0915	BFL
x 450	-	165	13,5	16,5	0,0955	BFL
x 500	-	190	14,5	17,5	0,1086	BFL
x 550	-	215	15,0	18,0	0,1218	BFN
x 560	-	220	15,0	18,0	0,1244	BFN
x 600	-	240	15,5	18,5	0,1349	BFN
x 630	-	255	16,0	19,0	0,1428	BFN
x 650	-	265	16,5	19,5	0,1481	BFN
x 700	-	290	17,5	20,5	0,1612	BFN
x 710	-	295	17,5	20,5	0,1638	BFN
x 750	15	315	18,0	21,0	0,1744	BFN
x 800	40	340	18,5	21,5	0,1875	BFN
x 900	90	390	20,0	23,0	0,2138	BF
x 1000	140	440	21,5	24,5	0,2401	BF
355 x 160	-	20	7,5	9,5	0,0288	BFL
x 180	-	30	8,0	9,5	0,0352	BFL
x 200	-	40	8,5	10,0	0,0415	BFL
x 225	-	52,5	9,0	10,5	0,0494	BFL
x 250	-	65	9,5	11,0	0,0573	BFL
x 280	-	80	10,0	11,5	0,0668	BFL
x 300	-	90	10,0	11,5	0,0731	BFL
x 315	-	97,5	11,0	12,0	0,0778	BFL
x 355	-	117,5	11,5	13,0	0,0905	BFL
x 400	-	140	12,0	13,5	0,1047	BFL
x 450	-	165	13,0	16,0	0,1100	BFL
x 500	-	190	13,5	16,5	0,1251	BFN
x 550	-	215	14,5	17,5	0,1403	BFN
x 560	-	220	14,5	17,5	0,1433	BFN
x 600	-	240	15,0	18,0	0,1554	BFN
x 630	-	255	15,5	18,5	0,1645	BFN
x 650	-	265	16,0	19,0	0,1706	BFN
x 700	-	290	17,0	20,0	0,1857	BFN
x 710	-	295	17,0	20,0	0,1888	BFN
x 750	-	315	17,5	20,5	0,2009	BFN
x 800	15	340	18,5	21,5	0,2160	BF
x 900	40	390	20,0	23,0	0,2463	BF
x 1000	90	440	21,5	24,5	0,2766	BF
400 x 160	140	20	8,0	10,0	0,0329	BFL
x 180	-	30	8,5	10,0	0,0401	BFL
x 200	-	40	9,0	10,5	0,0473	BFL
x 225	-	52,5	9,5	11,0	0,0563	BFL
x 250	-	65	10,0	11,5	0,0654	BFL
x 280	-	80	10,5	12,0	0,0762	BFL
x 300	-	90	10,5	12,5	0,0834	BFL

x 315	-	97,5	11,0	12,5	0,0888	BFL
x 355	-	117,5	12,0	13,5	0,1033	BFL
x 400	-	140	13,0	14,5	0,1195	BFL
x 450	-	165	13,5	16,5	0,1263	BFL

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.	Mech. contr.
			mech [kg]	servo [kg]			
750 x 630	15	255	24,0	27,0	0,3790	BF	M2
x 650	-	265	24,5	27,5	0,3930	BF	M2
800 x 160	-	20	12,5	15,5	0,0546	BFL	M1
x 180	-	30	13,0	16,0	0,0696	BFL	M1
x 200	-	40	13,5	16,5	0,0845	BFL	M1
x 225	-	52,5	14,5	17,5	0,1032	BFL	M1
x 250	-	65	15,0	18,0	0,1219	BFL	M2
x 280	-	80	16,0	19,0	0,1444	BFL	M2
x 300	-	90	16,5	19,5	0,1593	BFL	M2
x 315	-	97,5	16,5	19,5	0,1705	BFL	M2
x 355	-	117,5	18,0	21,0	0,2005	BFN	M2
x 400	-	140	19,5	22,5	0,2341	BFN	M2
x 450	-	165	20,5	23,5	0,2715	BFN	M2
x 500	-	190	22,0	25,0	0,3089	BFN	M2
x 550	-	215	23,0	26,0	0,3463	BF	M2
x 560	-	220	23,5	26,5	0,3538	BF	M2
x 600	-	240	24,5	27,5	0,3837	BF	M2
900 x 160	-	20	13,5	16,5	0,0619	BFL	M1
x 180	-	30	14,0	17,0	0,0789	BFL	M1
x 200	-	40	15,0	18,0	0,0958	BFL	M1
x 225	-	52,5	15,5	18,5	0,1170	BFL	M2

A x B [mm]	a [mm]	c [mm]	weight design		effect. area Sef. [m²]	Actu. mech.	Mech. contr.
			mech [kg]	servo [kg]			
900 x 250	-	65	16,5	19,5	0,1382	BFL	M2
x 280	-	80	17,0	20,0	0,1637	BFL	M2
x 300	-	90	17,5	20,5	0,1806	BFL	M2
x 315	-	97,5	18,0	21,0	0,1933	BFN	M2
x 355	-	117,5	19,5	22,5	0,2273	BFN	M2
x 400	-	140	21,0	24,0	0,2654	BFN	M2
x 450	-	165	22,5	25,5	0,3078	BFN	M2
x 500	-	190	23,5	26,5	0,3502	BF	M2
x 550	-	215	25,0	28,0	0,3926	BF	M2
1000 x 160	-	20	15,0	18,0	0,0692	BFL	M1
x 180	-	30	15,5	18,5	0,0882	BFL	M1
x 200	-	40	16,0	19,0	0,1071	BFL	M2
x 225	-	52,5	17,0	20,0	0,1308	BFL	M2
x 250	-	65	17,5	20,5	0,1545	BFL	M2
x 280	-	80	18,5	21,5	0,1830	BFL	M2
x 300	-	90	19,0	22,0	0,2019	BFN	M2
x 315	-	97,5	19,5	22,5	0,2161	BFN	M2
x 355	-	117,5	21,0	24,0	0,2541	BFN	M2
x 400	-	140	22,5	25,5	0,2967	BFN	M2
x 450	-	165	14,0	27,0	0,3441	BFN	M2
x 500	-	190	25,5	28,5	0,3915	BF	M2

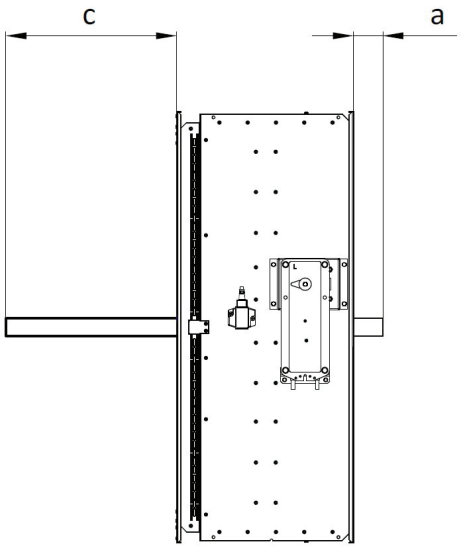
3.3 Blades overlaps

Tab 3.3.1. Blades overlaps

Blades overlaps		Dimension	Overlaps
Blades 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

Fig. 14 Blades overlaps



3.4 For the design .60 (with BKN supply and communication device) add to weight of the damper with an actuating mechanism (from the Tab 4.2.1.) the weight of BKN…0,5 kg.

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

3.6 Flanges of dampers (Fig. 22, 23).

Fig. 15 Flange of Damper- OPERATORS SIDE

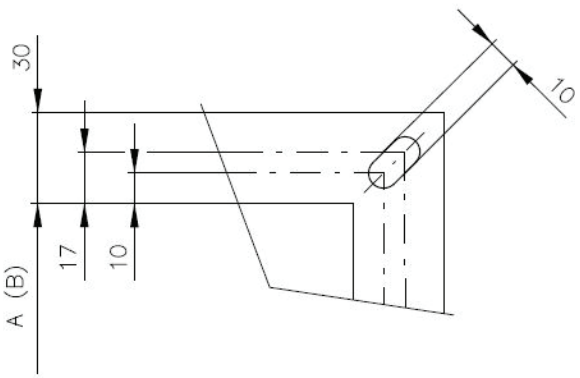
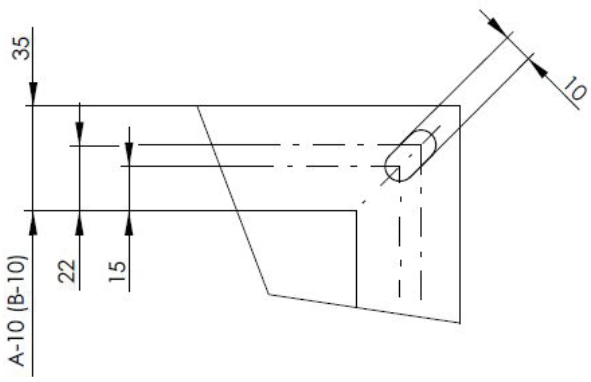


Fig. 16 Flange of Damper- INSTALLATIONS SIDE



4. Placement and Assembly

4.1 Fire dampers are suitable for installation in arbitrary position in vertical and horizontal passages of fire separating constructions. Damper assembly procedures must be done so as all load transfer from the fire separating constructions to the damper body is absolutely excluded. Back-to-back air-conditioning piping must be hung or supported so as all load transfer from the back-to-back piping to the damper is absolutely excluded. Installation gap must be filled by approved material perfectly in all the installation space volume (installation gap).

To provide needed access space to the control device, all other objects must be situated at least 350 mm from the control parts of the damper. Inspection hole must be accessible.

Damper blade has to be inside of construction (labelled with BUILD IN EDGE on the damper body) after installation. The fire damper can also be installed 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 firefighting insulation.

The distance between the fire damper and the construction (wall, ceiling) must be minimum 75 mm. In case that two or more dampers are supposed to be installed in one fire separating construction, the distance between the adjacent dampers must be at least 200 mm according to EN 1366-2 paragraph 13.5.

Exceptions are given in chapter 6.

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

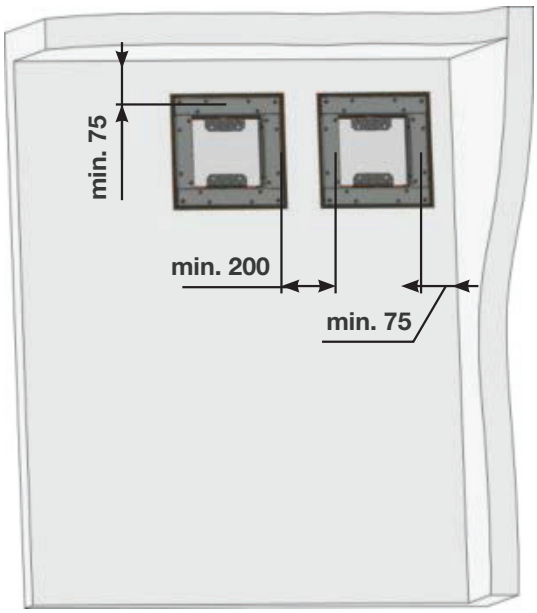
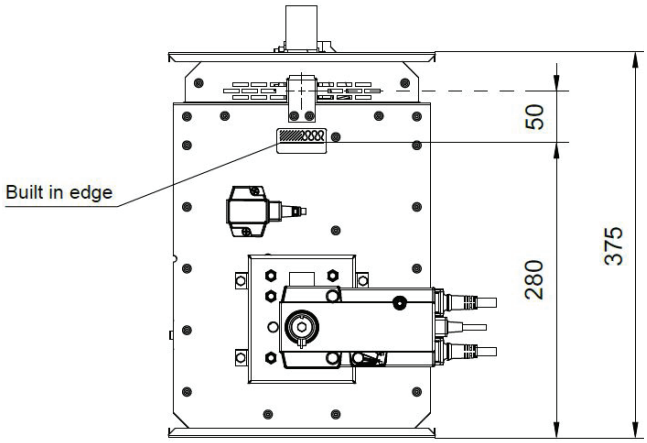


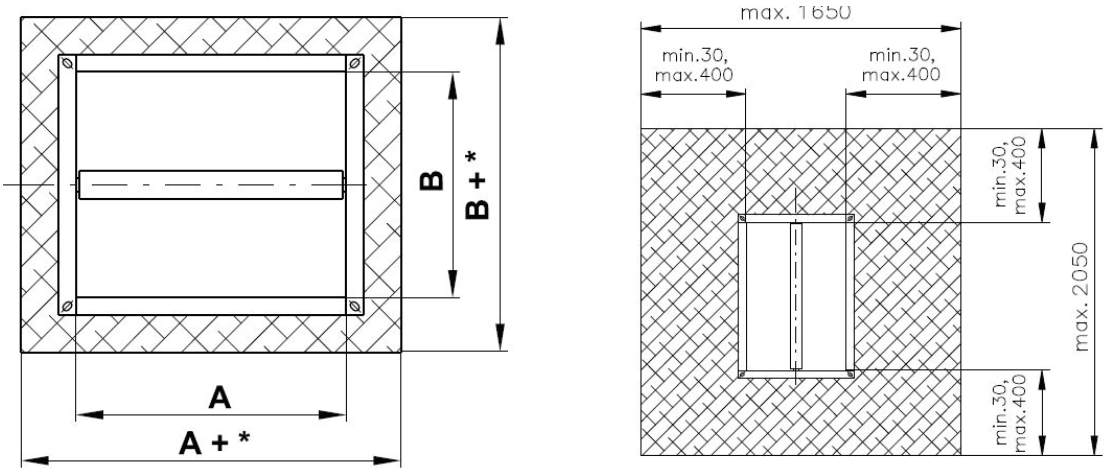
Fig. 18 Built in edge



"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 The control mechanism has to be protected (covered) against damage and pollution during installation process. All fire dampers has to be closed during installation process. The damper body should not be deformed in the course of bricking in. Once the damper is built in, its blade should not grind on the damper body during opening or closing.

Fig. 19 Installation opening



1- * The recommended dimension of the installation opening is from 25 mm to
2- 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

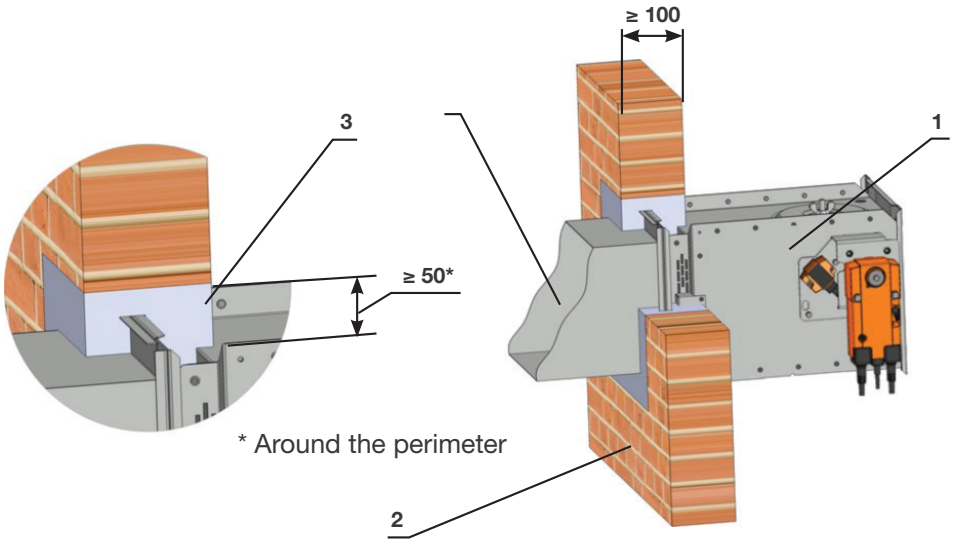
Tab 5.1.1.Installation method list

Fire separating constru.	Wall/Ceiling Min.thickness [mm]	Installation	Fire resist.	Page
Solid wall construction	100	Mortar or gypsum	EIS 120 EIS 90	22
	100	Stuffing box with fire protection mastic	EIS 60	22
	100	Fire protection foam with stucco plaster	EIS 60 EIS 45 EIS 30	23
	100	Battery - mortar or gypsum	EIS 90	24
	100	Installation next to wall - mortar or gypsum and mineral wool	EIS 90	25
	100	Stuffing box with fire protection mastic and cement lime plate	EIS 90	26
	100	Weichschott	EIS 90	27
Outside solid wall construction	100	Mineral wool - mortar or gypsum	EIS 60	28
	100	Mineral wool - stuffing box and fire protection mastic	EIS 60	29
	100	Mineral wool, stuffing box, fire protection mastic and cement lime plate	EIS 90 EIS 120	30
Gypsum wall construction	100	Mortar or gypsum	EIS 120 EIS 90	31
	100	Stuffing box with fire protection mastic EIS 60 40	EIS 60	32
	100	Fire protection foam with stucco plaster	EIS 60 EIS 45 EIS 30	33
	100	Battery - mortar or gypsum	EIS 90	34
	100	Installation next to wall - mortar or gypsum and mineral wool	EIS 90	35
	100	Stuffing box with fire protection mastic and cement lime plate	EIS 90	36
	100	Weichschott	EIS 90	37
Outside gypsum wall construction	100	Mineral wool - mortar or gypsum	EIS 60	38
	100	Mineral wool - stuffing box and fire protection mastic	EIS 60	39
	100	Mineral wool, stuffing box, fire protection mastic and cement lime plate	EIS 90 EIS 120	40
Solid ceiling construction	110 - Concrete 125 - Aerated concrete	Mortar or gypsum	EIS 120 EIS 90	42
		Stuffing box with fire protection mastic	EIS 60	43
		Battery - mortar or gypsum	EIS 90	44
		Stuffing box with fire protection mastic and cement lime plate	EIS 90	45
		Weichschott	EIS 90	46
Outside solid ceiling construction	110 - Concrete 125 - Aerated concrete	Mineral wool - mortar or gypsum	EIS 90 EIS 120	47
		Concrete	EIS 90	48

5.2 Installation in solid wall construction

Fig. 20 Solid wall construction- mortar or gypsum

EIS 120
EIS 90

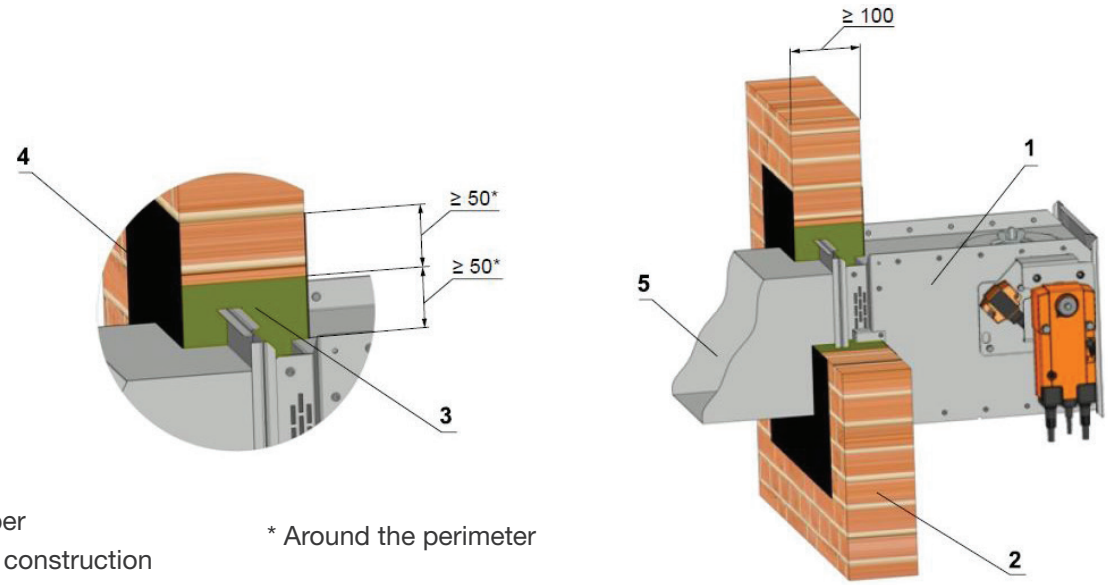


Position:
1 Fire damper
2 Solid wall construction
3 Mortar or gypsum
4 Duct

Shown schemes of incorporation and damper are illustrative only!

Fig. 21 Solid wall construction- stuffing box and fire protection mastic

EIS 60



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 Duct

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

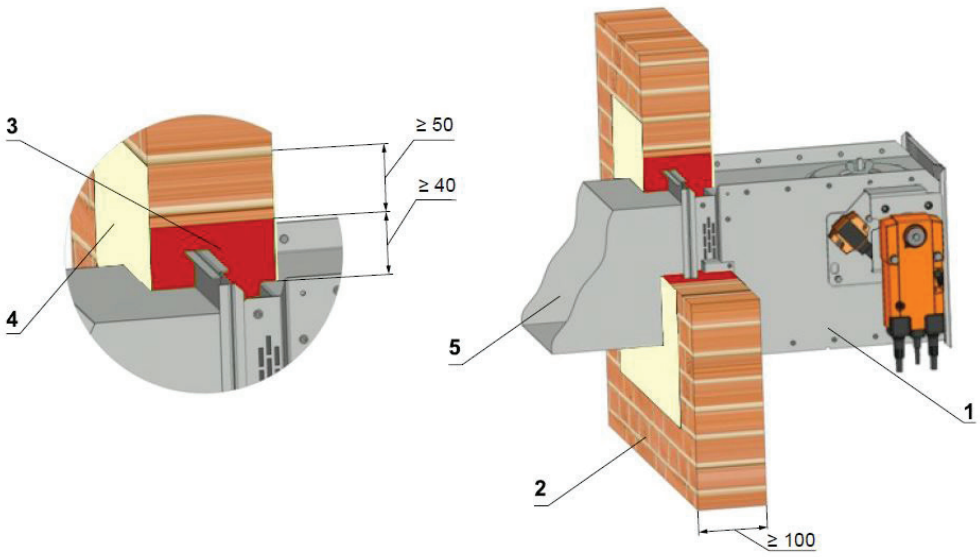
*** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.**

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

Fig. 22 Solid wall construction- fire protection foam with stucco plaster

Maximal damper dimensions 400x400 mm

EIS 60
EIS 45
EIS 30



Position:

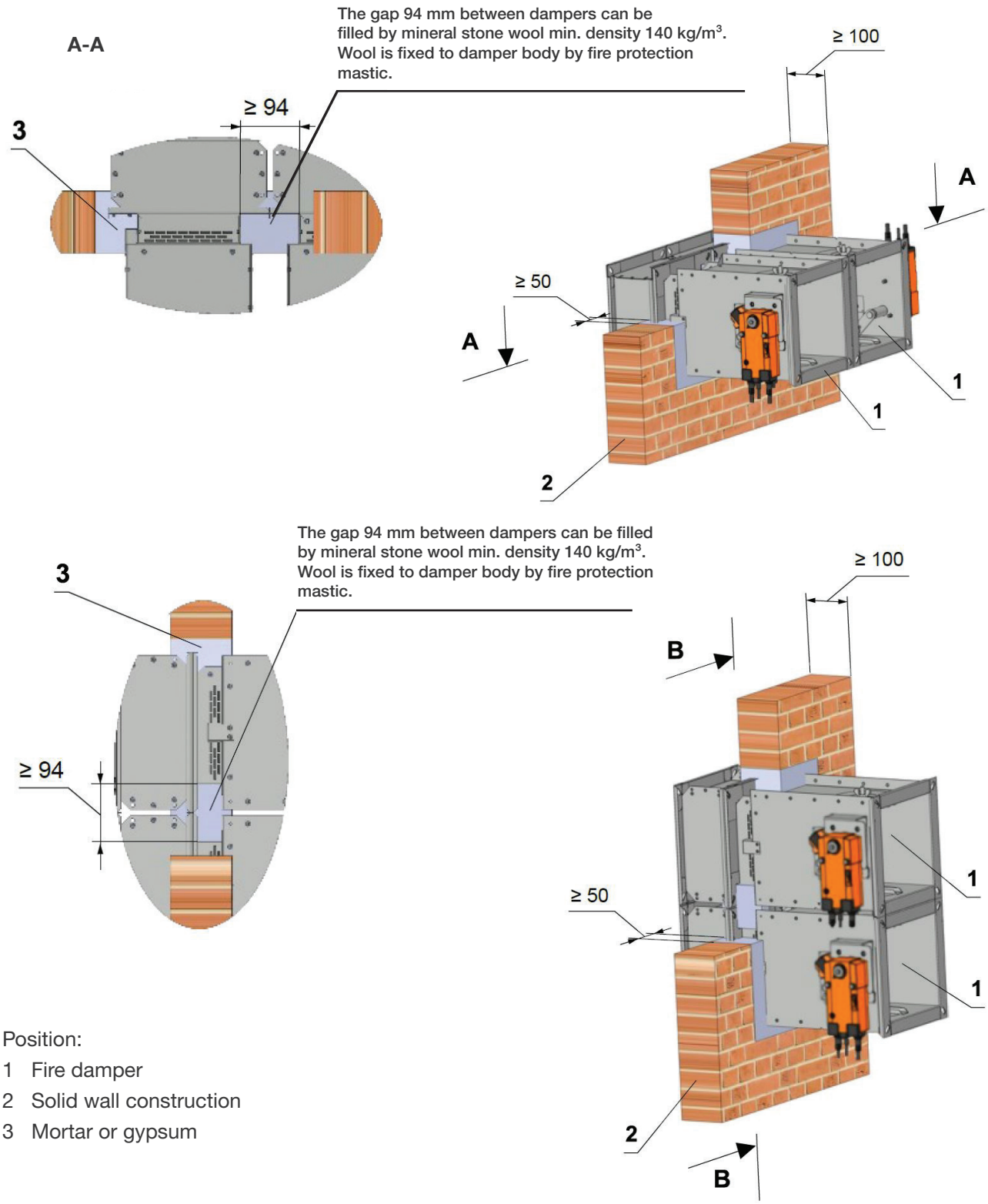
1 Fire damper
2 Solid wall construction
3 Fire protection foam
4 Stucco plaster
5 Duct

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. 23 Solid wall construction- battery- mortar or gypsum



Position:

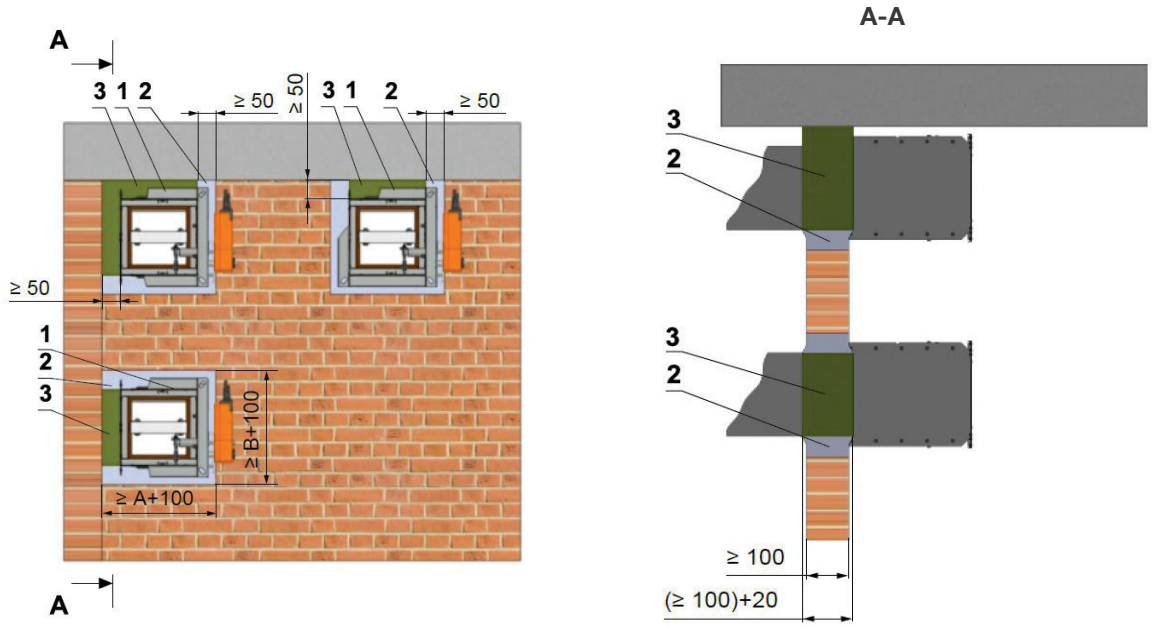
1 Fire damper
2 Solid wall construction
3 Mortar or gypsum

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

Shown schemes of incorporation and damper are illustrative only!

Fig. 24 Solid wall construction- installation next to wall, ceiling- mortar or gypsum and mineral wool.



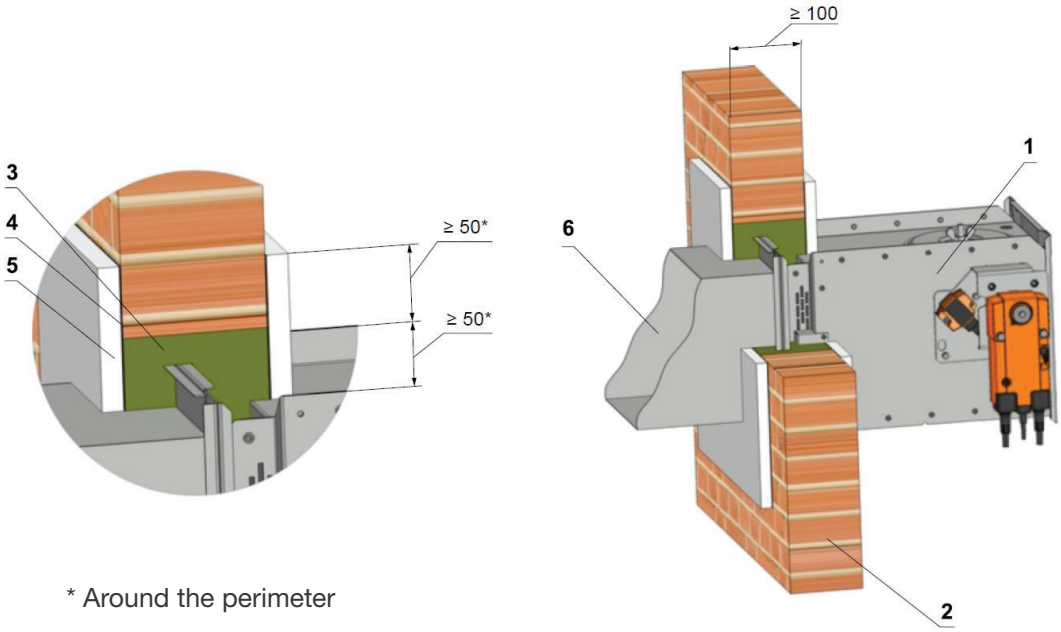
Notice:

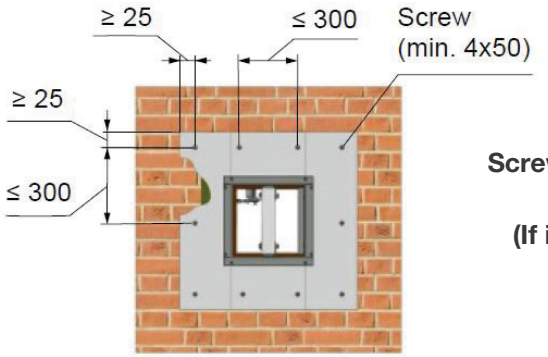
- Gap between damper and construction is filled by mortar or gypsum and mineral wool
- Wool is fixed to damper body and construction by fire protection mastic
- Mineral wool thickness = construction thickness + 20 mm or 50 mm
- Installation is valid for ceiling construction

Shown schemes of incorporation and damper are illustrative only!

Fig. 25 Solid wall construction- stuffing box, fire protection mastic and cement lime plate

EIS 90





Screws has to be fixed in wall/ceiling construction.

(If it is needed use steel bracket).

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:*

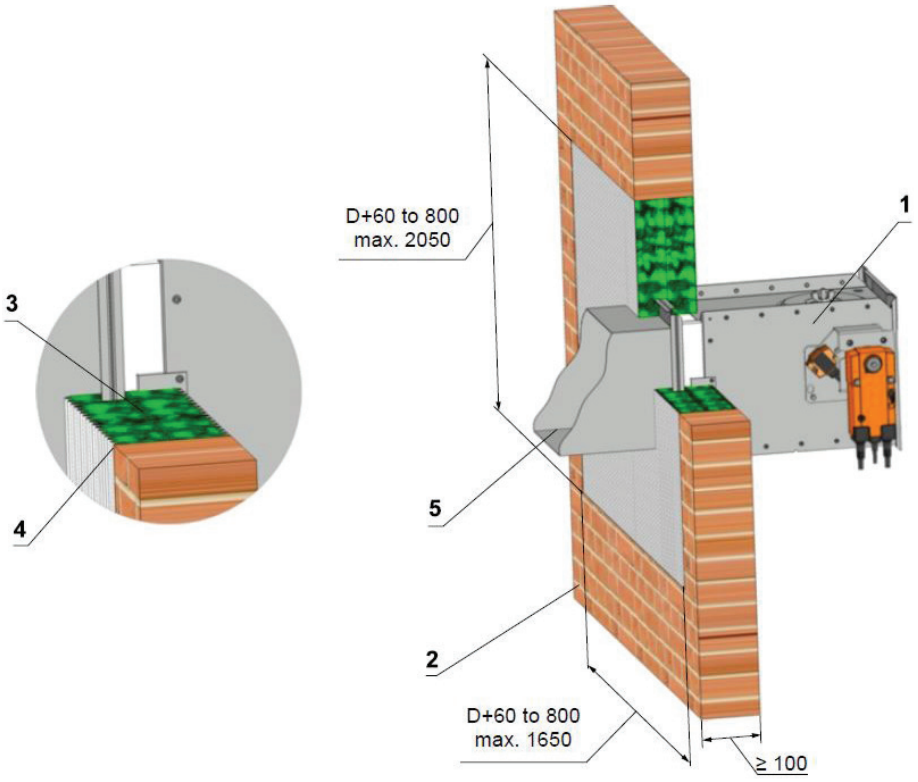
3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
4 Promastop - P, K, Hilti CFS-CT
5 Promatect - H

** 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. 26 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

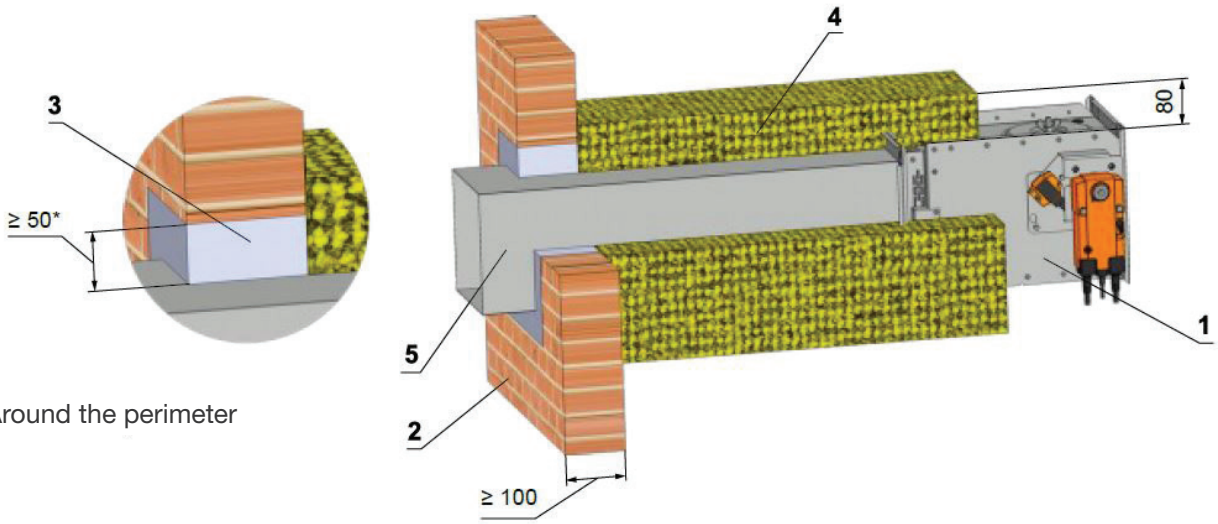
** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

Shown schemes of incorporation and damper are illustrative only!

5.3 Installation outside solid wall construction

Fig. 27 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.

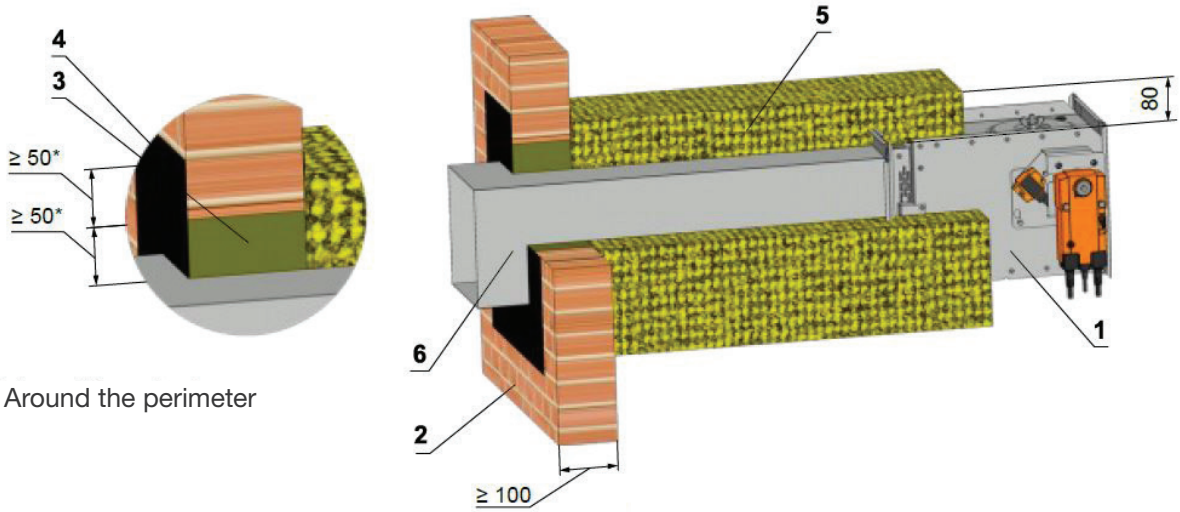
The maximum distance of the fire damper from the structure is not limited and according to EN 15882-2, the required number of suspensions acc. to EN 1366-1:2014 must be used.

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

EIS 60



* 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

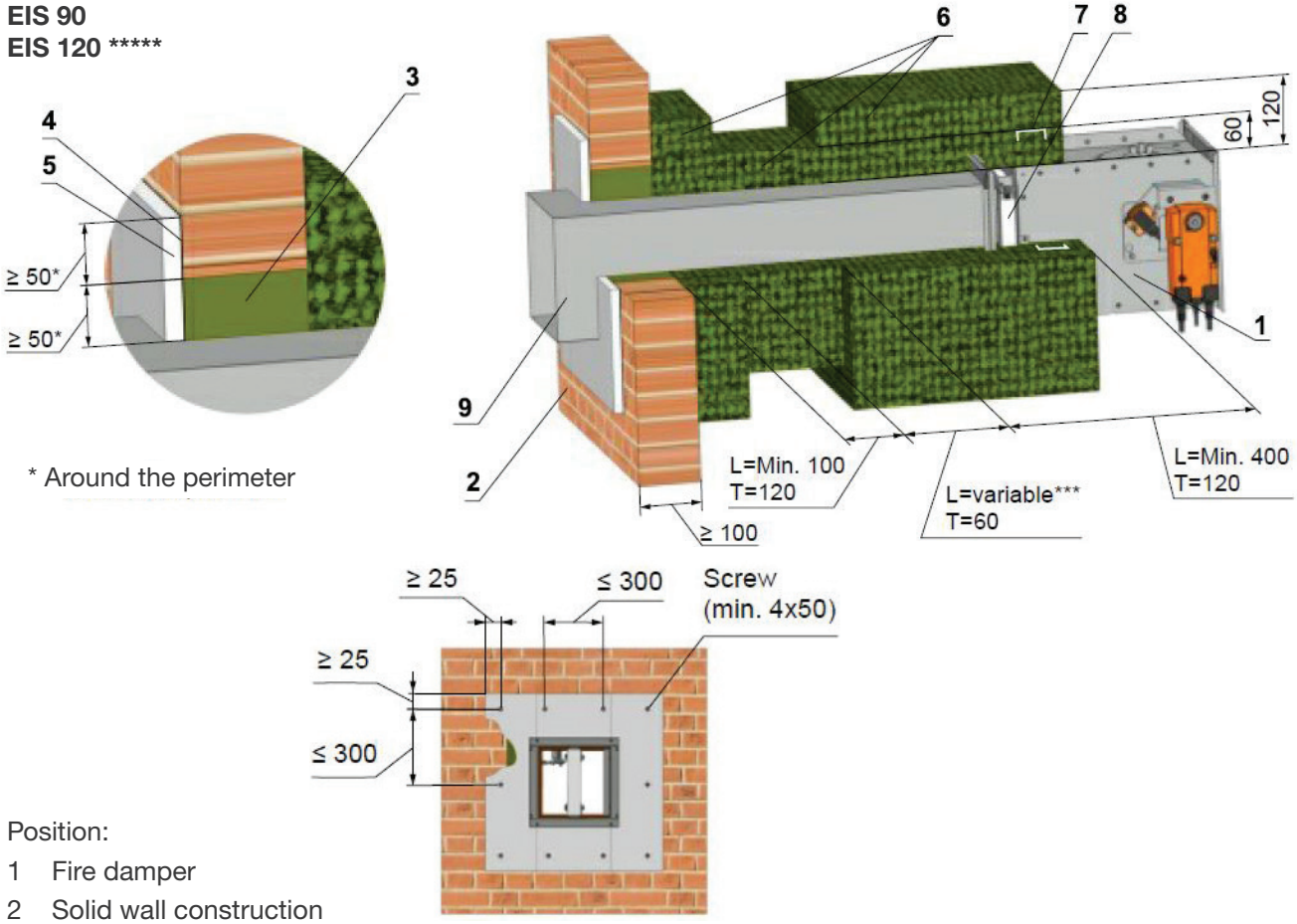
** The materials for stuffing box, fire protection mastic, lining and insulation materials can be replaced by another approved fire sealing system with equivalent properties.

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

EIS 90
EIS 120 ***



* Around the perimeter

Position:

1 Fire damper
2 Solid wall construction
3 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 bound with use of an organic resin with crushed stone as a refrigerant, min. density 300 kg/m^3 and min. thickness 60 mm
7 Profil U25x40x25
8 VRM****
9 Duct

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

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

**** Reinforcement fixing VRM 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.

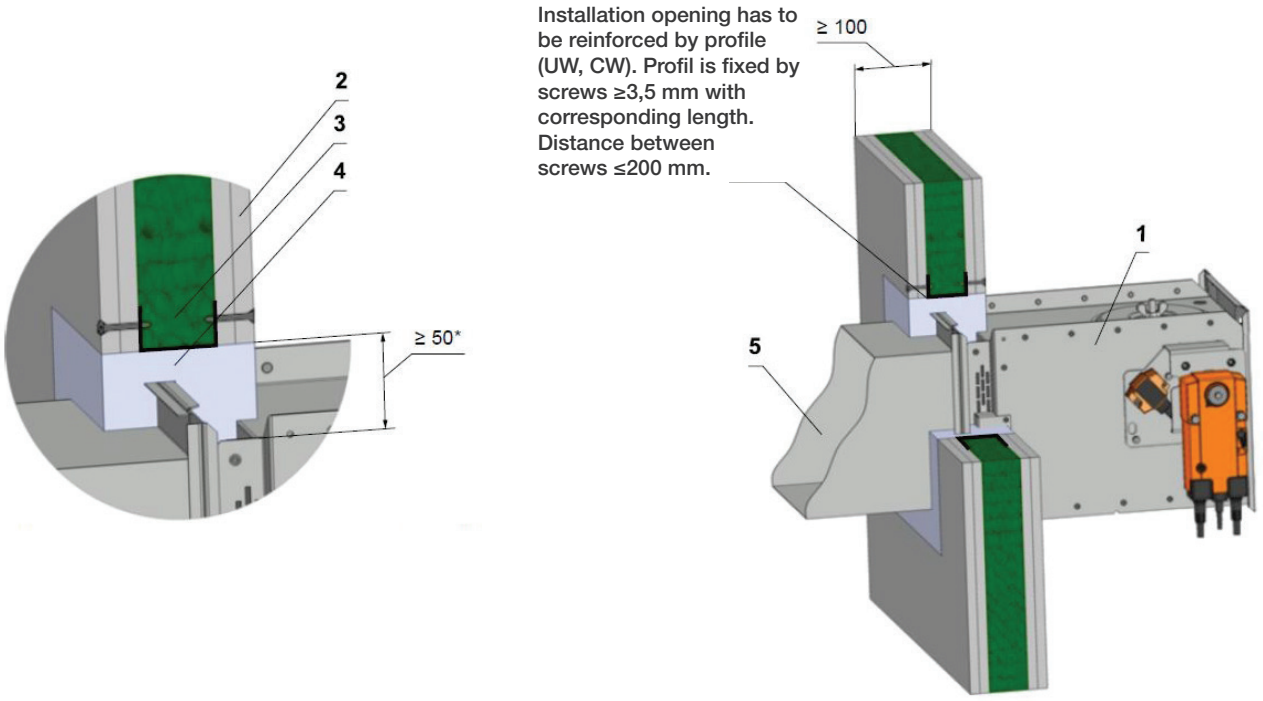
T - thickness of the insulation (mm)

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. 30 Gypsum wall construction- mortar or gypsum

EIS 120
EIS 90



* Around the perimeter

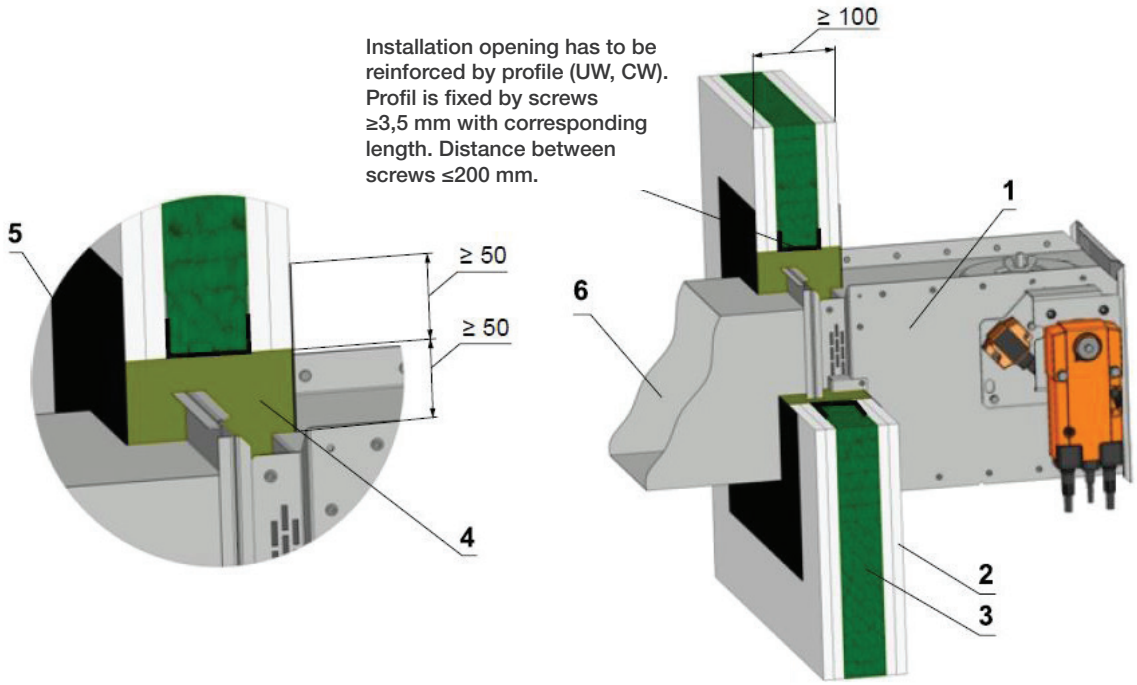
Position:

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. 31 Gypsum wall construction- 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 Mineral stone wool min. min. density 140 kg/m^3
5 Fire protection mastic min. thickness 1 mm
6 Duct

Used materials - example:*

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

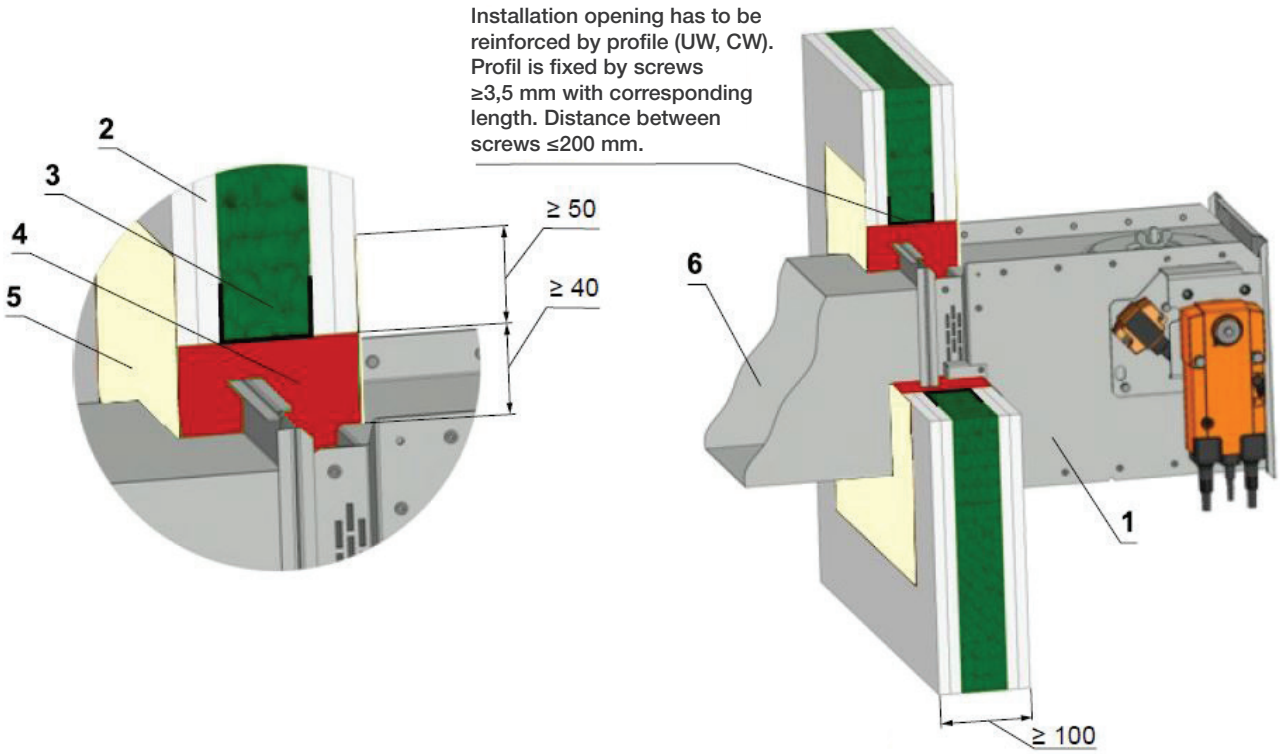
* Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

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

Fig. 32 Gypsum wall construction- fire protection foam with stucco plaster

Maximum damper dimensions 400x400 mm

EIS 60
EIS 45



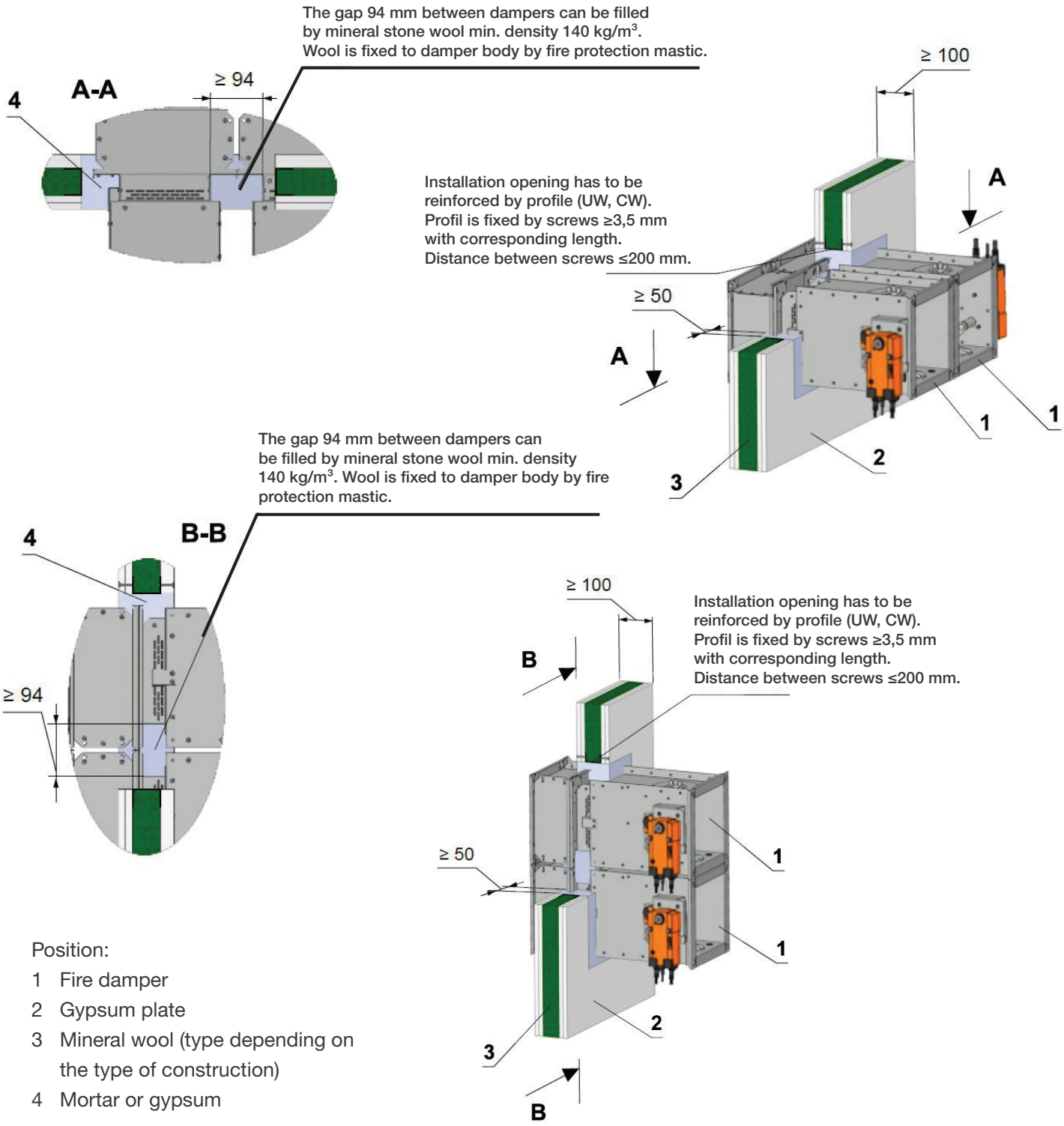
n foam
5 Stucco plaster
6 Duct

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. 33 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

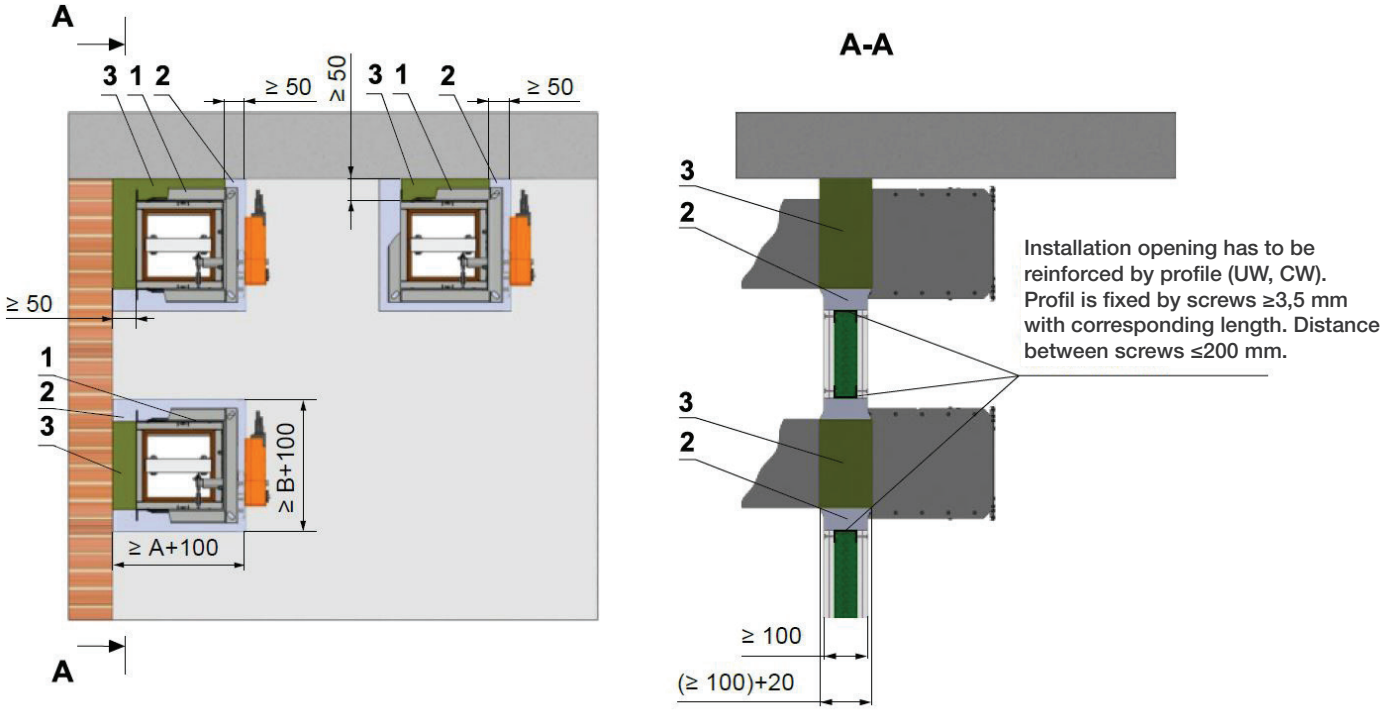
Notice:

- 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 4 dampers can be installed

Shown schemes of incorporation and damper are illustrative only!

Fig. 34 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

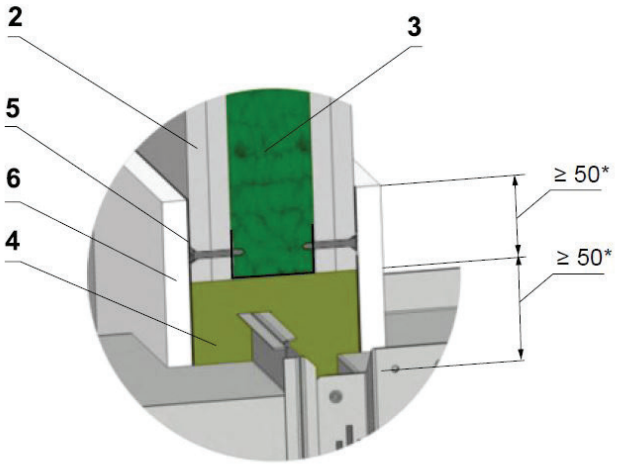
Notice:

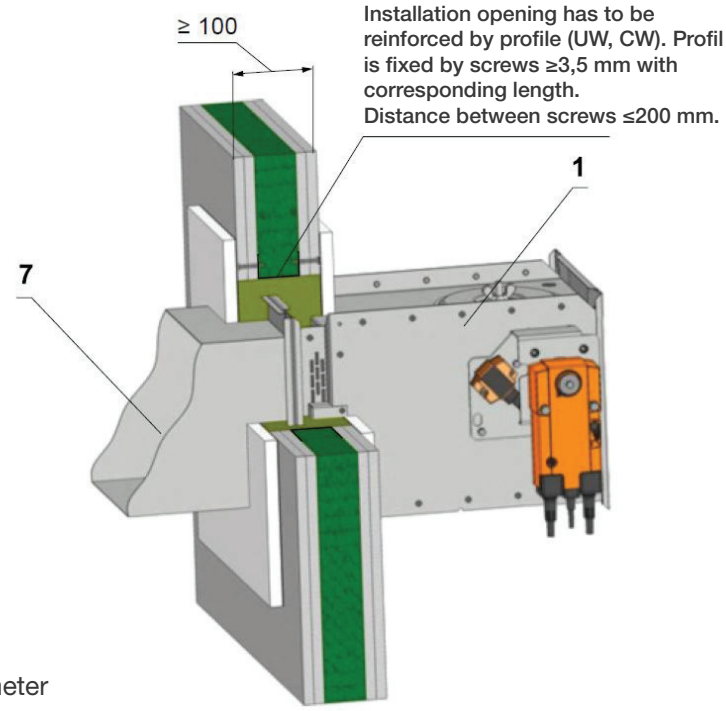
- Gap between damper and construction is filled by mortar or gypsum and mineral wool
- Wool is fixed to damper body and construction by fire protection mastic
- Mineral wool thickness = construction thickness + 20 mm or 50 mm
- Installation is valid for ceiling construction

Shown schemes of incorporation and damper are illustrative only!

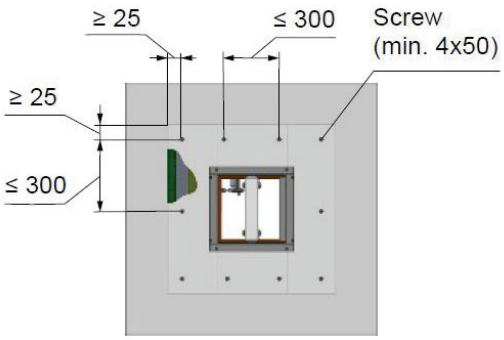
Fig. 35 Gypsum wall construction- stuffing box, fire protection mastic and cement lime plate

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

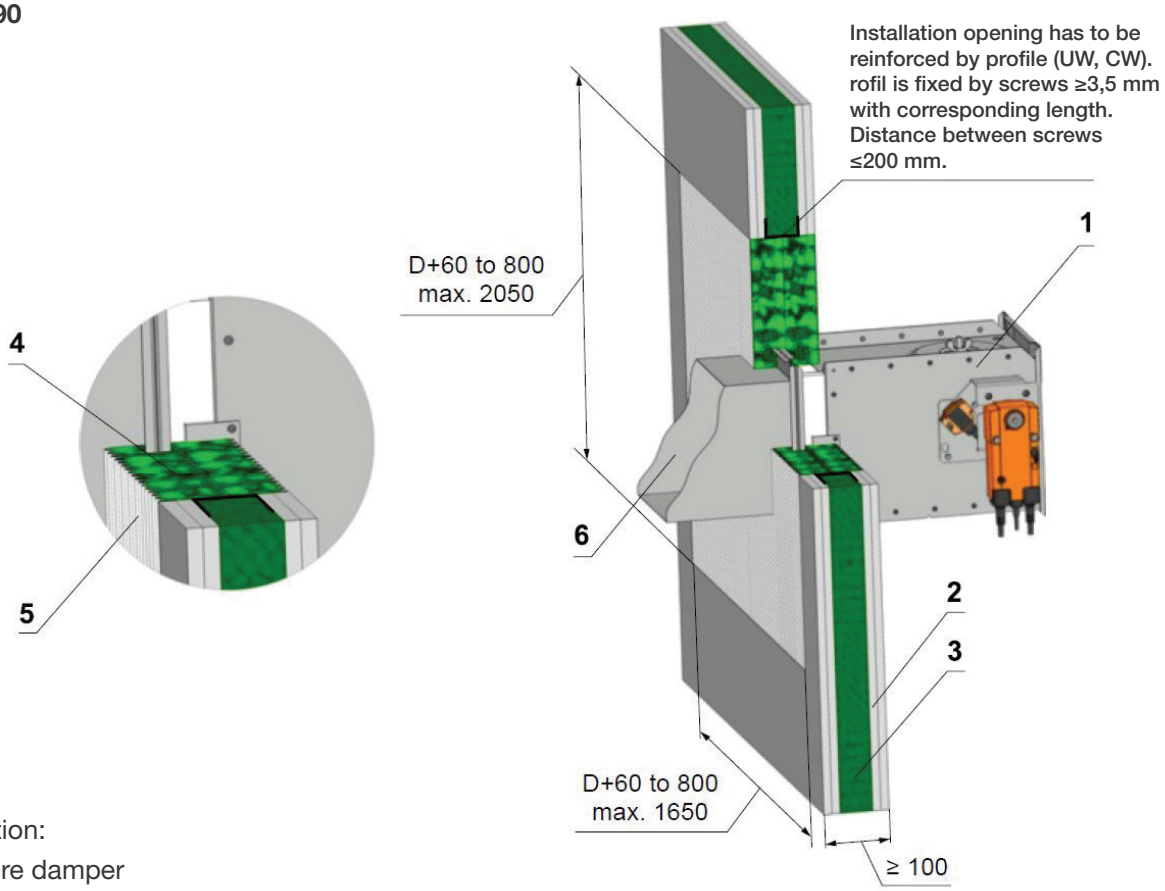
** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

The damper must be anchored to the fire wall construction!

Shown schemes of incorporation and damper are illustrative only!

Fig. 36 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

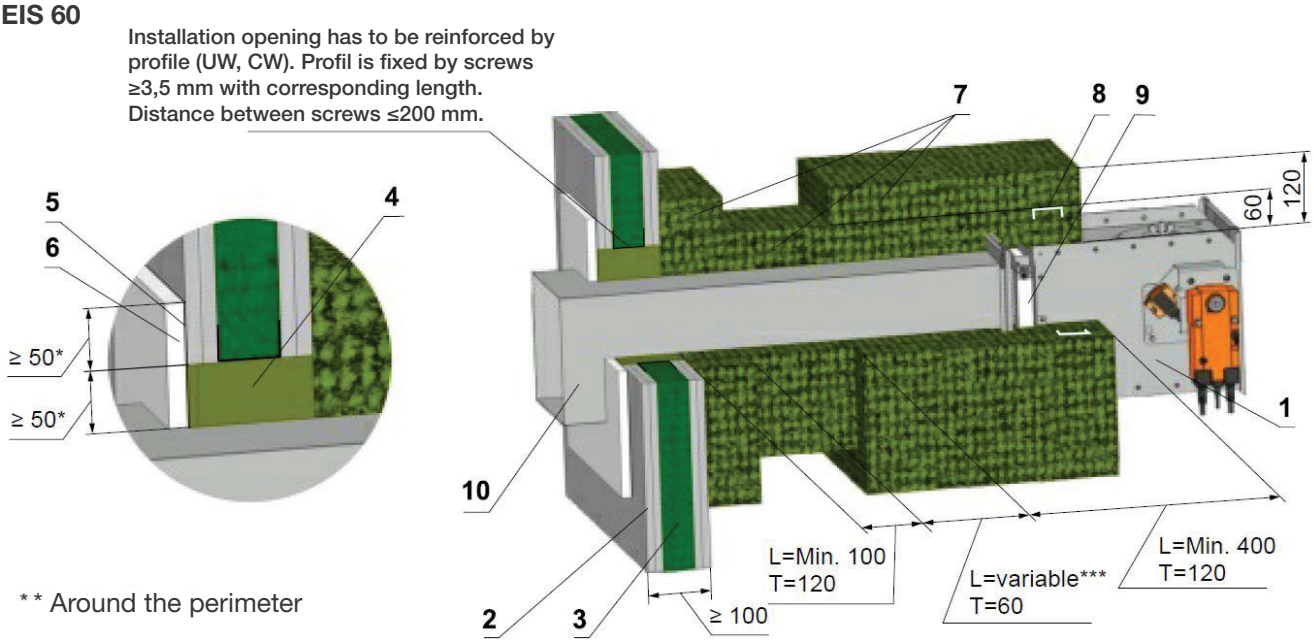
** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

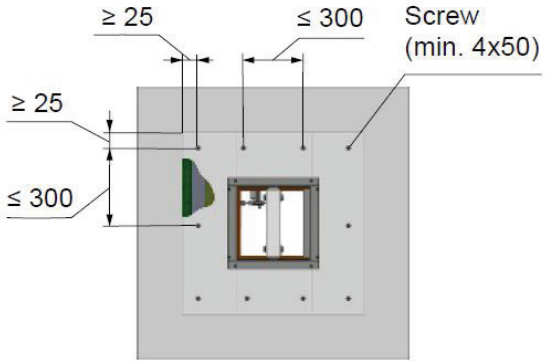
Shown schemes of incorporation and damper are illustrative only!

5.5 Installation outside gypsum wall construction

Fig. 37 Outside gypsum wall construction- mineral wool- mortar or gypsum

EIS 60





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 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

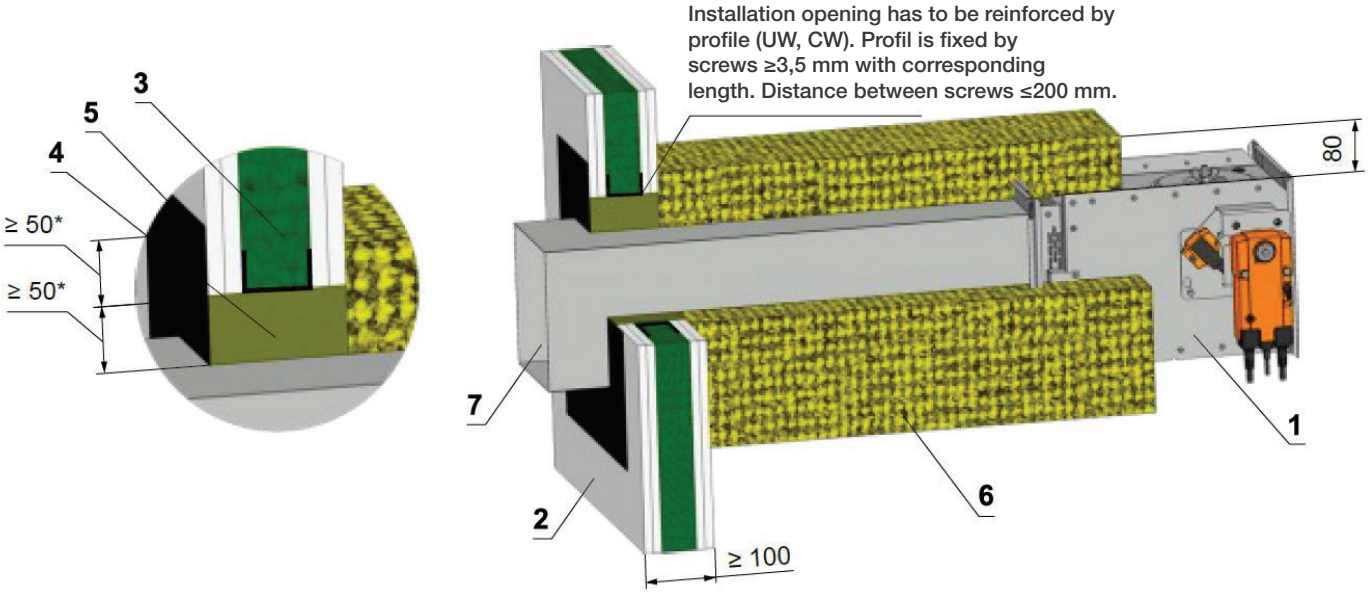
** The materials for stuffing box, fire protection mastic, lining and insulation materials can be replaced by another approved fire sealing system with equivalent properties. The maximum distance of the fire damper from the structure is not limited and according to EN 15882-2, the required number of 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. 38 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

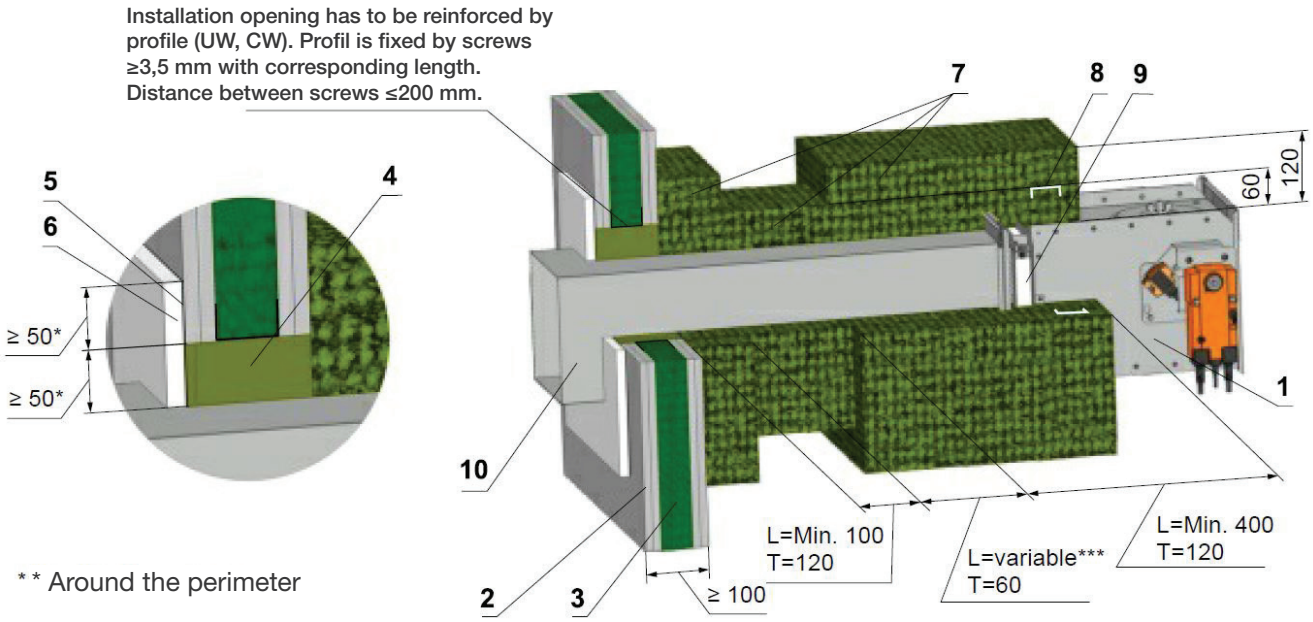
Used materials - example:*
4 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
5 Promastop - P, K, Hilti CFS-CT
6 Isover Ultimate Protect SLAB 4.0, th. 80 mm ALU1

** 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.

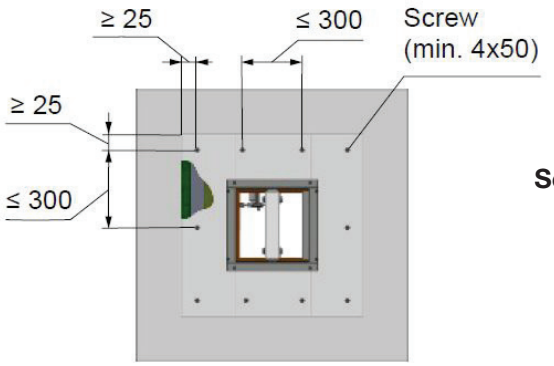
The duct at the point of penetration can be anchored to the fire wall construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 39 Outside gypsum wall construction- mineral wool- stuffing box and fire protection mastic and cement plate

EIS 90
EIS 120 ***



* * 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 Stone wool bound with use of an organic resin with crushed stone as a refrigerant, min. density 300 kg/m^3 and min. thickness 60 mm
8 Profil U25x40x25
9 VRM****
10 Duct

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

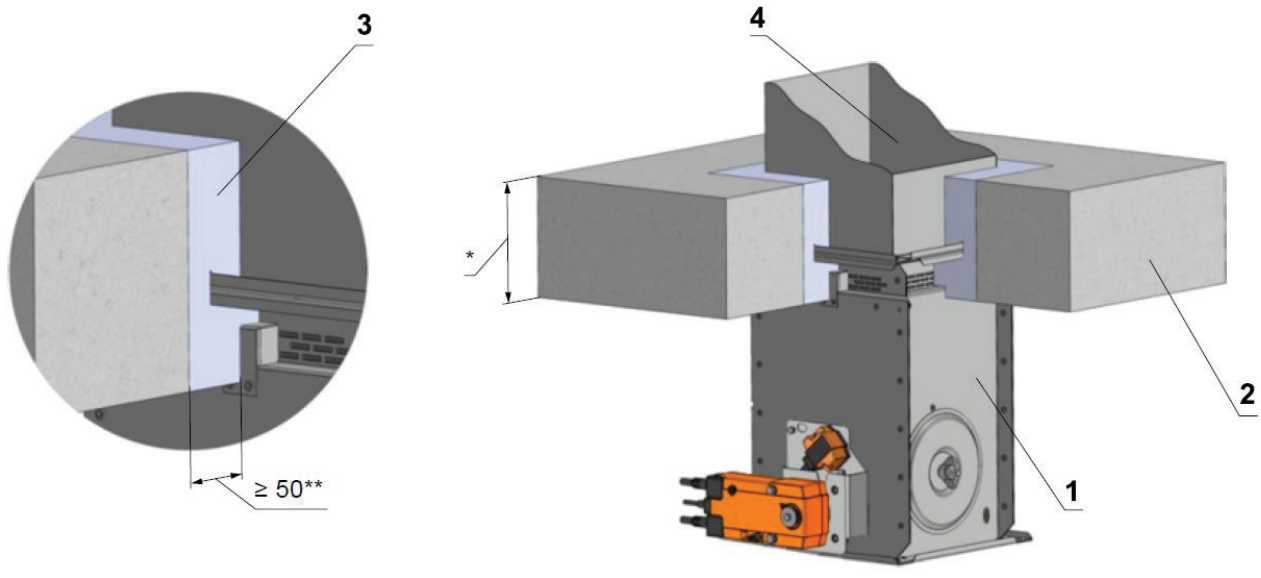
** Stuffing box, fire protection mastic, cement lime plate and insulation materials can be replaced by another approved fire sealing system for damper installation with equivalent material properties.
*** Depends on the distance of the flap from the construction, when the maximum distance from the construct 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. 40 Solid ceiling construction- mortar or gypsum

EIS 120
EIS 90



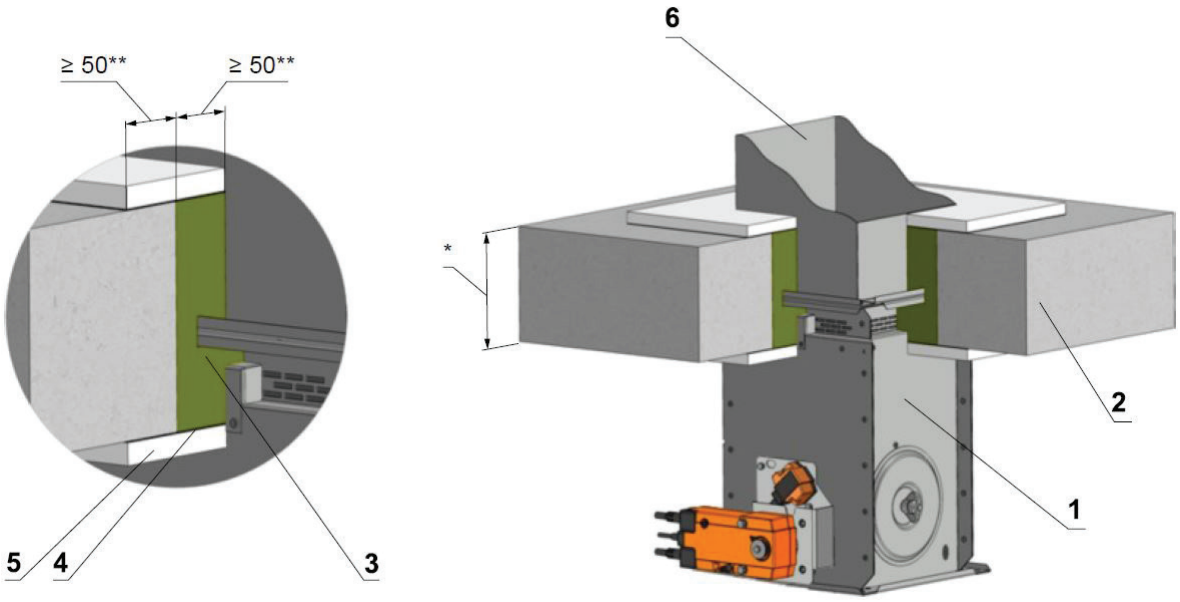
Position:
1 Fire damper
2 Solid ceiling construction
3 Mortar or gypsum
4 Duct

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

Shown schemes of incorporation and damper are illustrative only!

Fig. 41 Solid ceiling construction- stuffing box, fire protection mastic

EIS 60



Position:
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 Duct

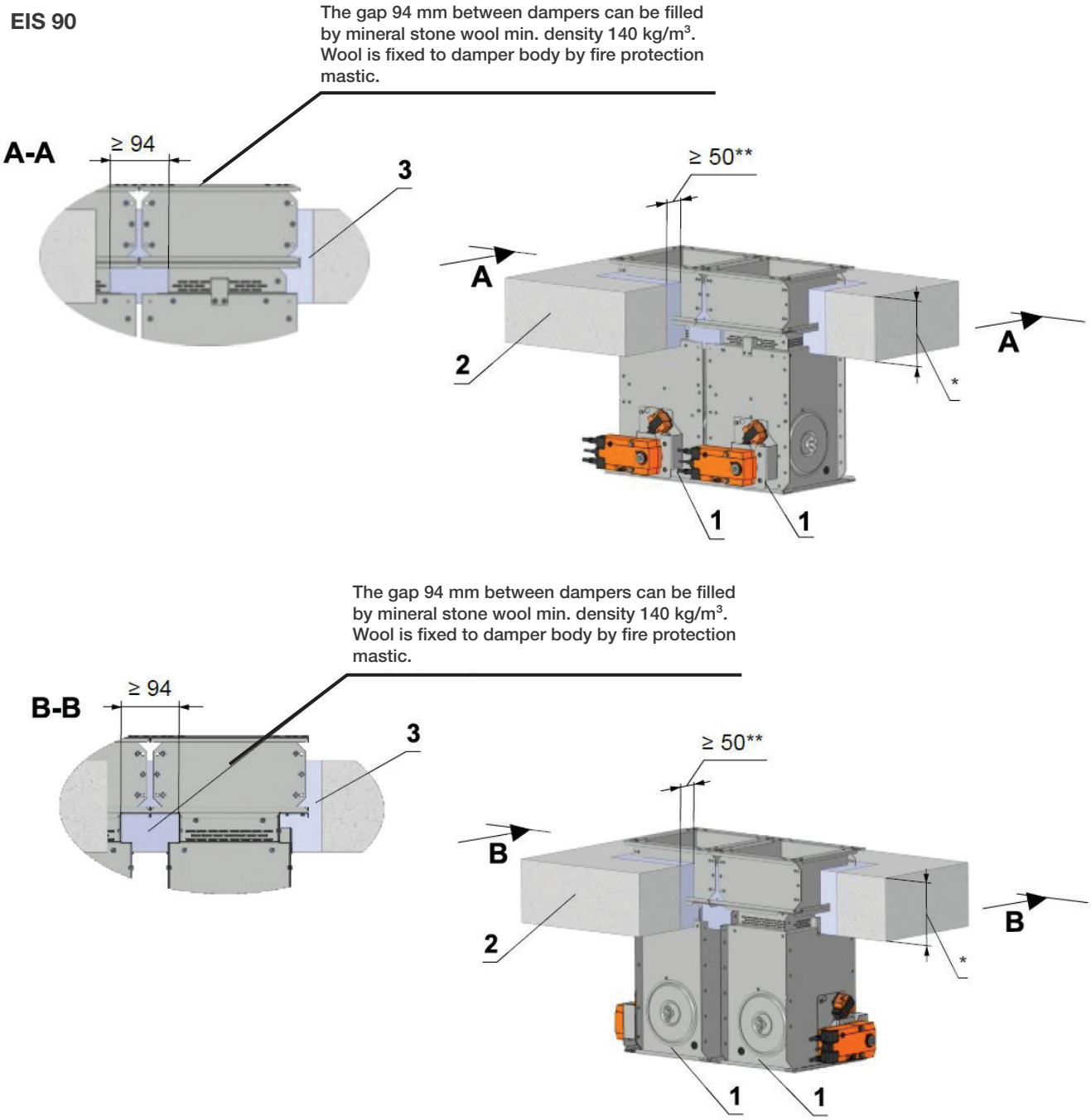
Used materials - example:**
3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
4 Promastop - P, K, Hilti CFS-CT

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

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. 42 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

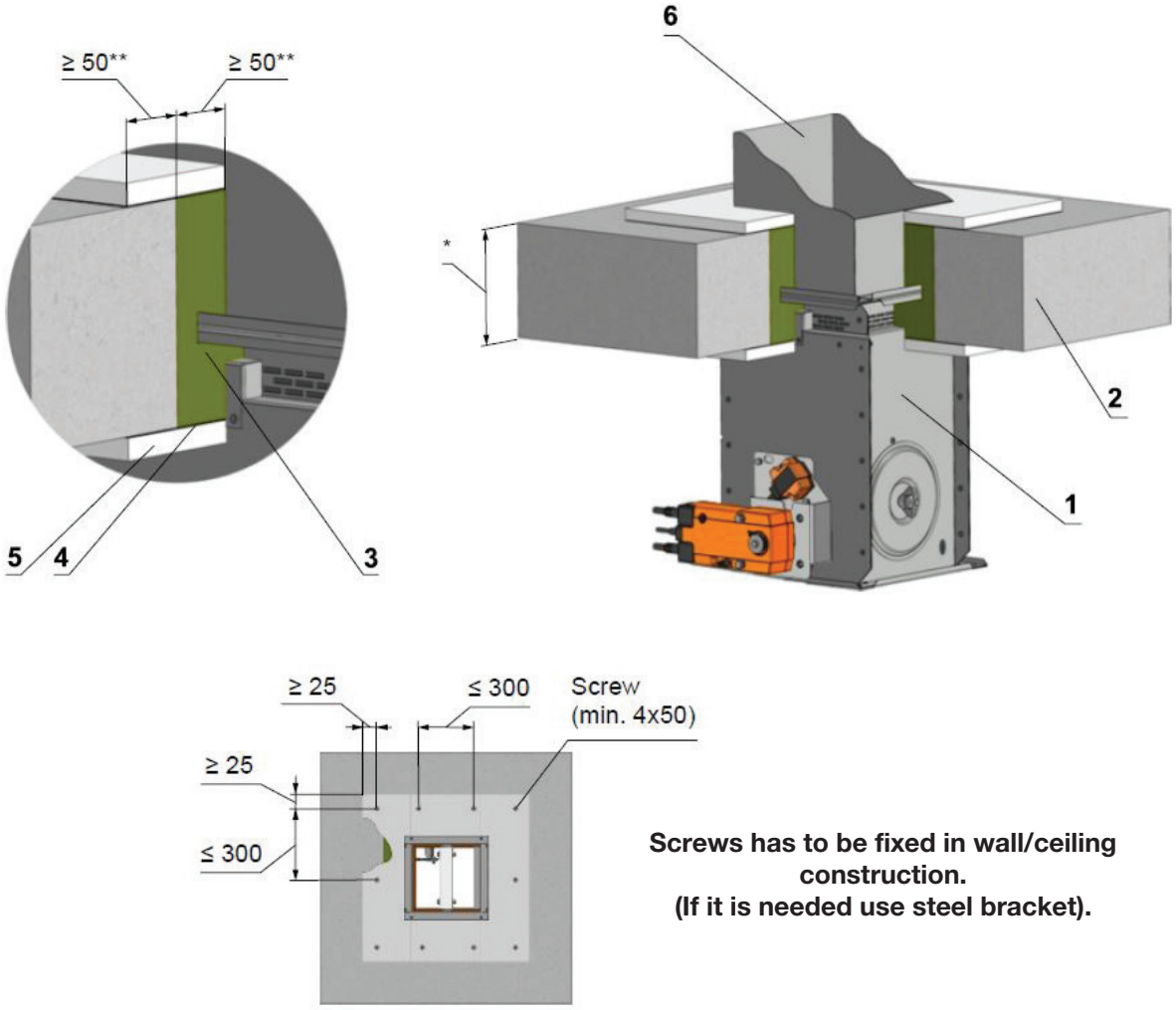
Notice:

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

EIS 90



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

Position:

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

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

Used materials - example:***

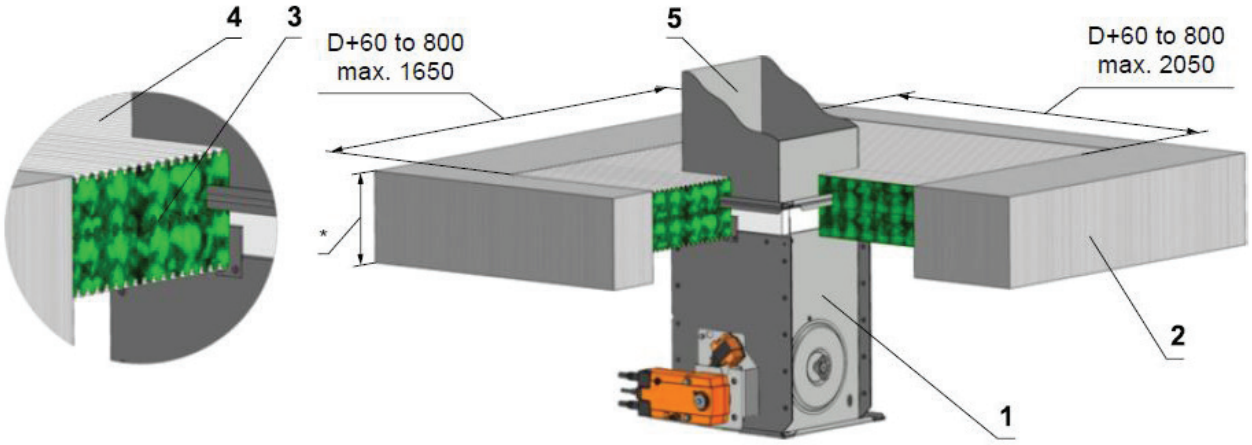
3 Promapyr, Rockwool Steprock HD, Hilti CFS-CT B 1S 140/50
4 Promastop - P, K, Hilti CFS-CT

***** 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. 44 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

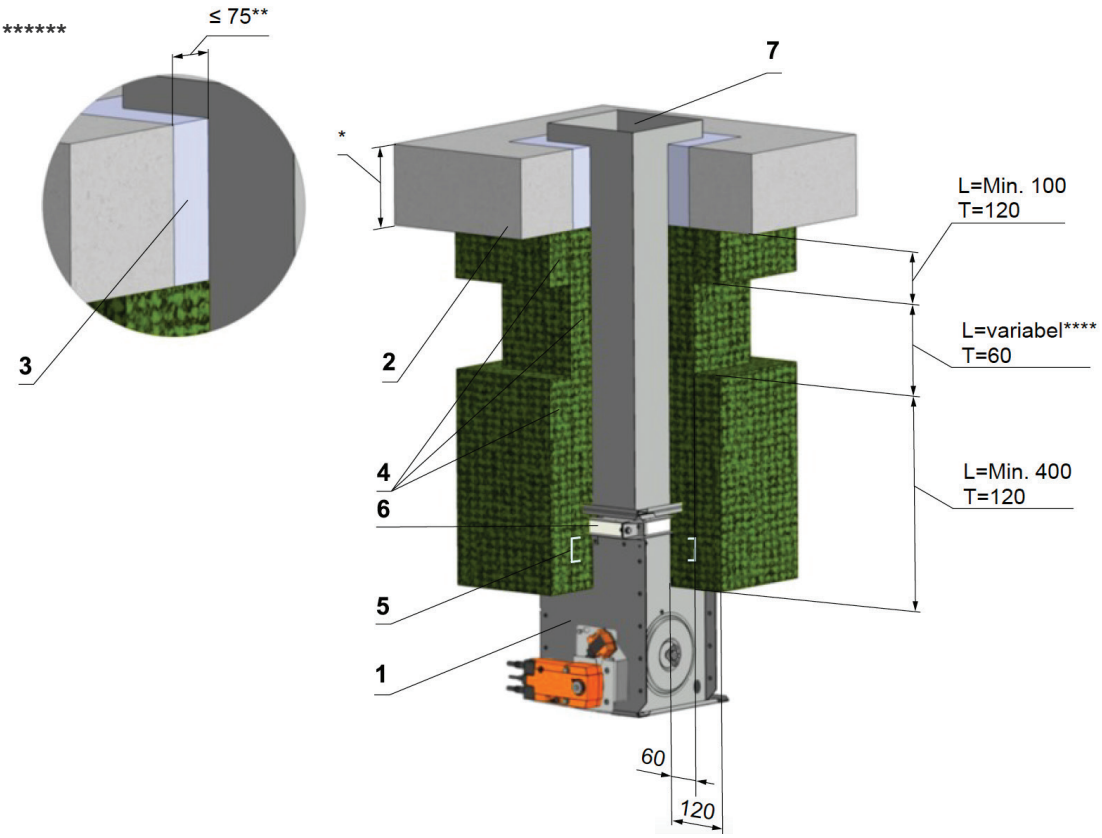
**** Fire resistant insulation and fire resistant board can be replaced by another approved fire sealing system for damper installation with equivalent material properties.**

Shown schemes of incorporation and damper are illustrative only!

5.7 Installation outside solid ceiling construction

Fig. 45 Outside solid ceiling construction- mineral wool- mortar and gypsum

EIS 90
EIS 120 ****



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
6 VRM*****
7 Duct

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

Used materials - example:**
4 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

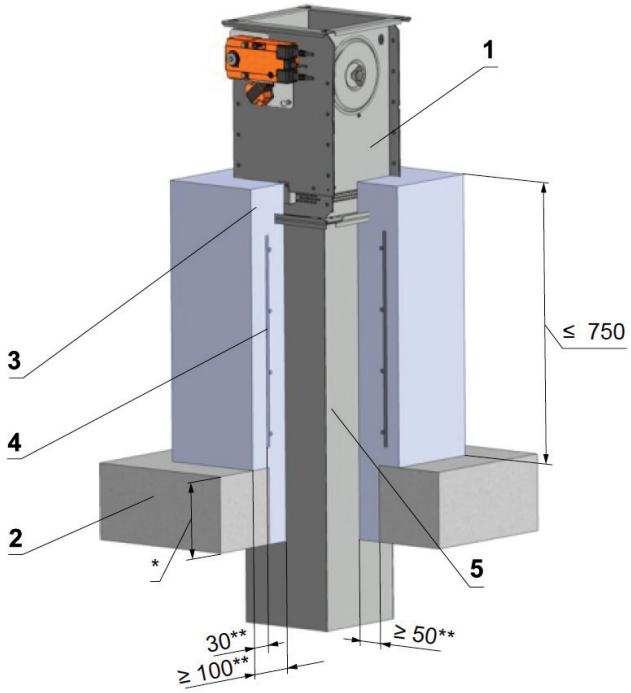
***** When using Rockwool Conlit Ductrock EIS 120, th. 60 mm, the overall fire resistance of the EIS 120 can be achieved.

T - thickness of the insulation (mm)

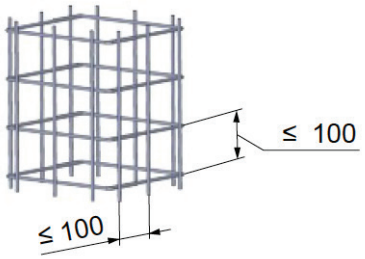
The duct at the point of penetration can be anchored to the fire ceiling construction!
Shown schemes of incorporation and damper are illustrative only!

Fig. 46 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

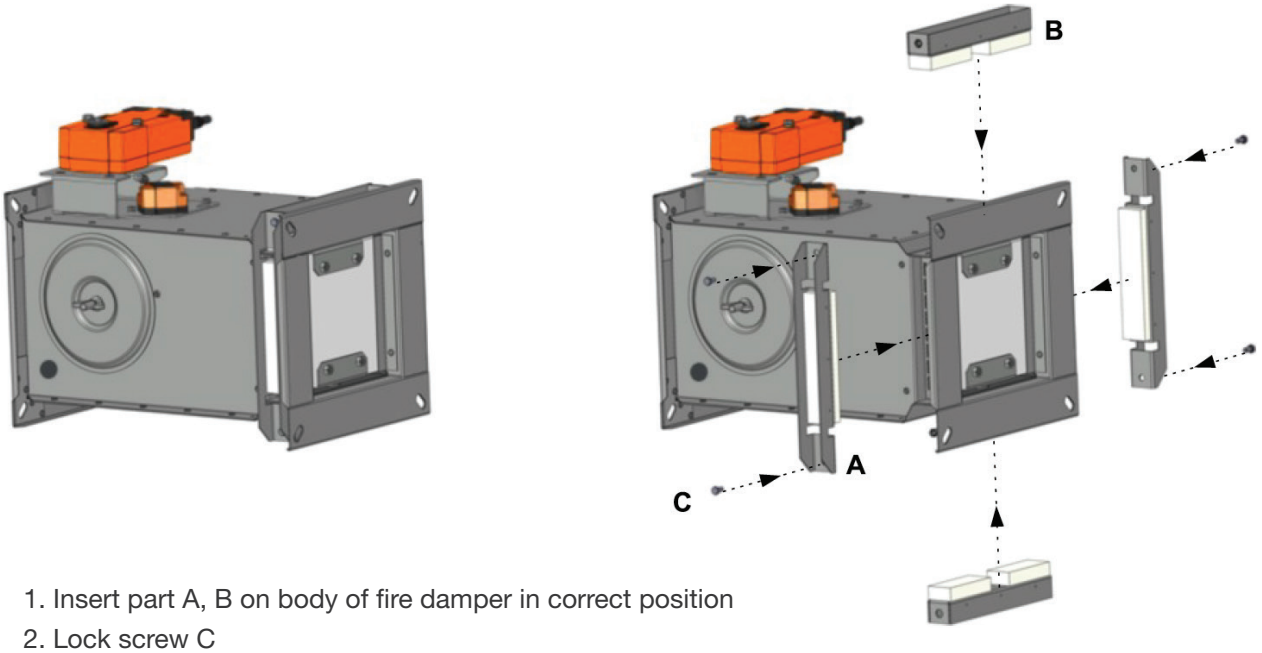
* min. 110 - Concrete/ min. 125 - Aerated concrete
** Around the perimeter

Shown schemes of incorporation and damper are illustrative only!

6. Installation frames

Fig. 47 Fixing of reinforcement to damper body VRM

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

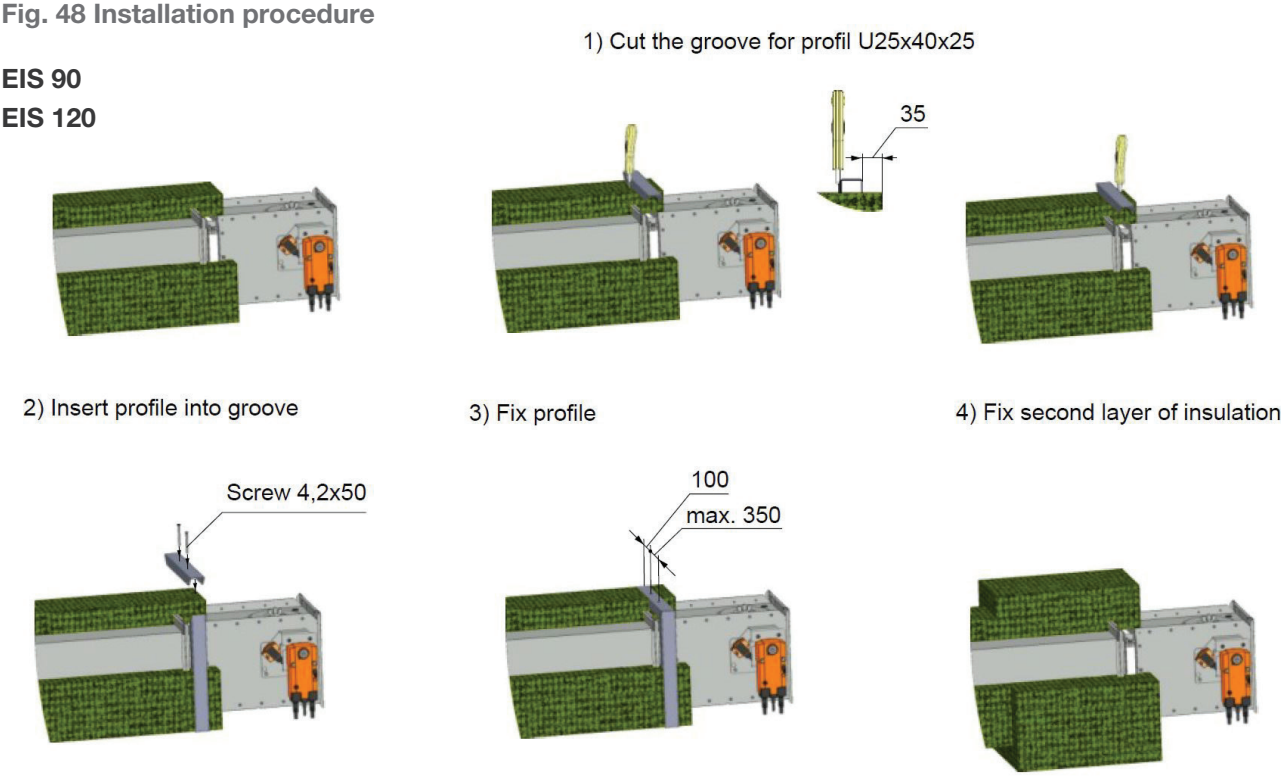


1. Insert part A, B on body of fire damper in correct position
2. Lock screw C
3. It has to be done on each corner of VRM

Shown dampers are illustrative only!

Fig. 48 Installation procedure

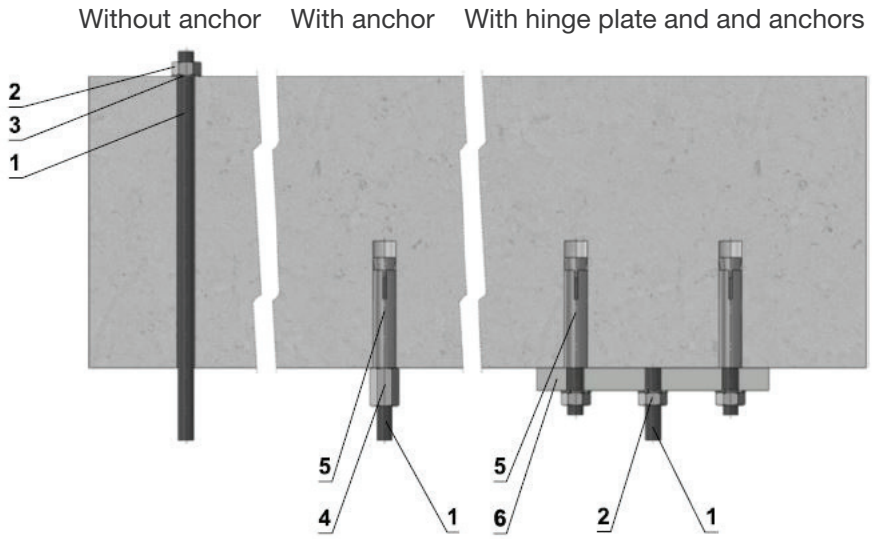
EIS 90
EIS 120



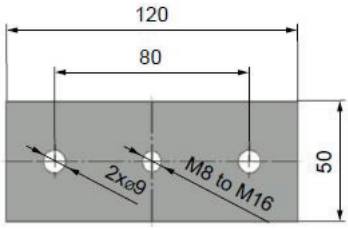
Installation details see chapter 9.4
Shown schemes of incorporation and damper are illustrative only!

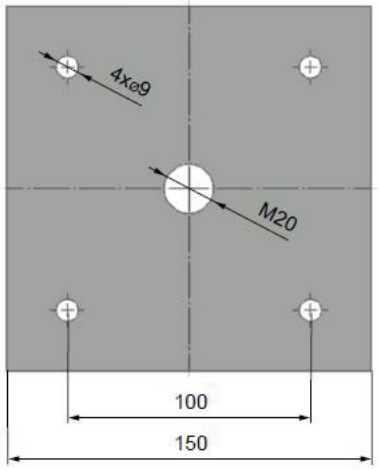
7. Suspension systems

8. Fig. 49 Mounting to the ceiling wall



Hinge plates





Position:

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

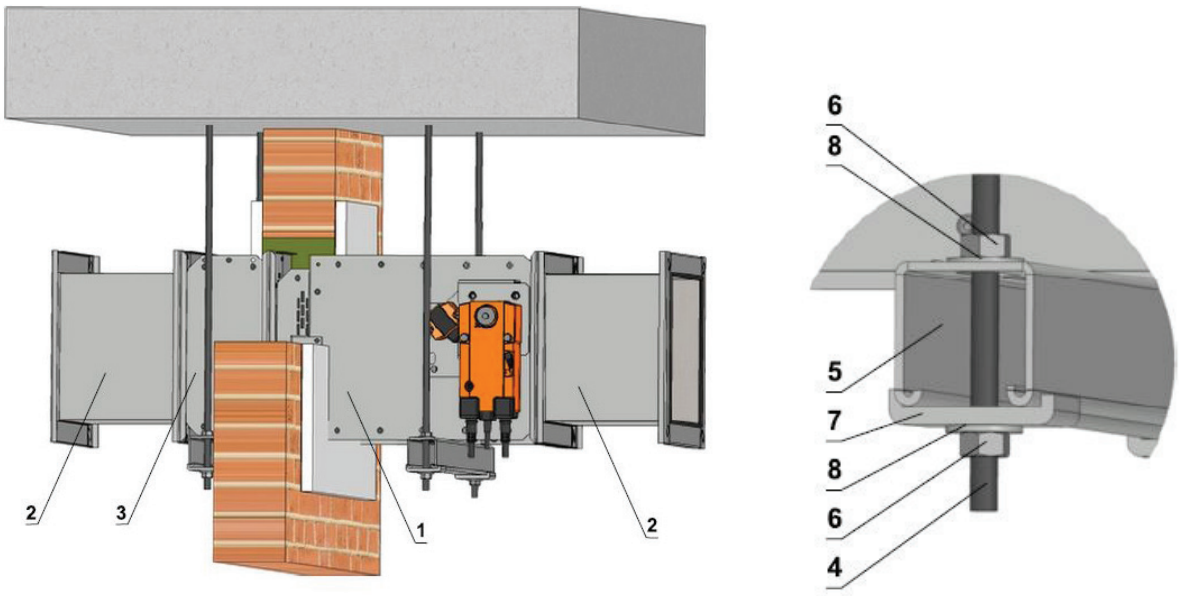
Load capacities of threaded hanger rods F [N] at the required resistance 90 minutes

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 - see fig. 48

Fig. 50 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.

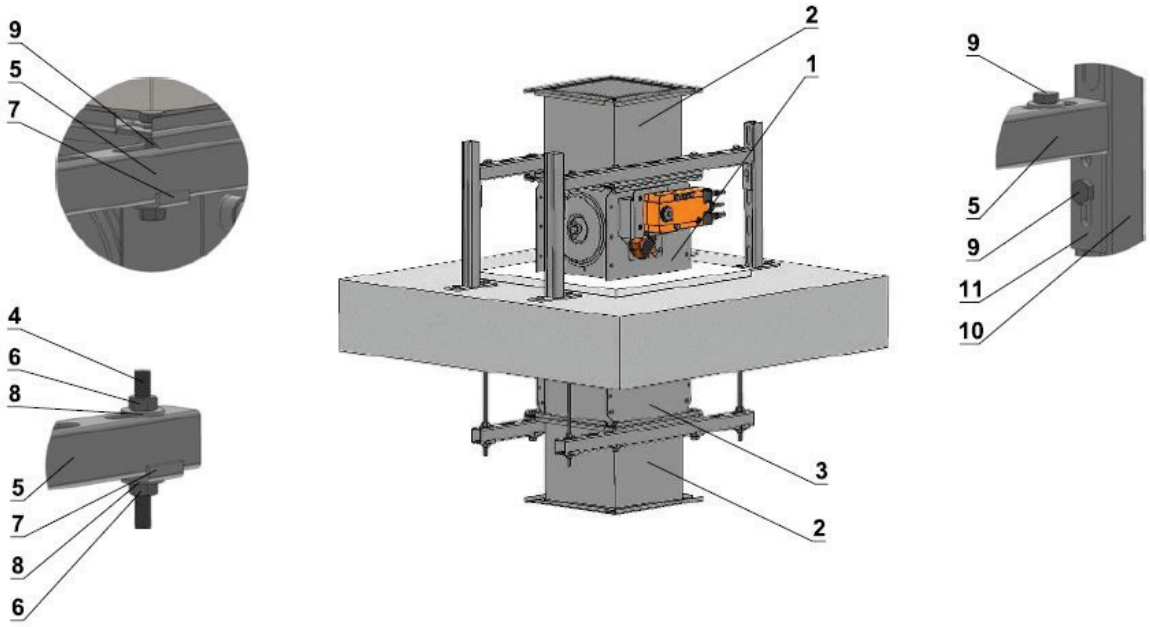
Shown schemes of incorporation and damper are illustrative only!

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.
Threaded rod fixing to the ceiling construction - see fig. 83

Fig. 51 Suspension- vertical duct

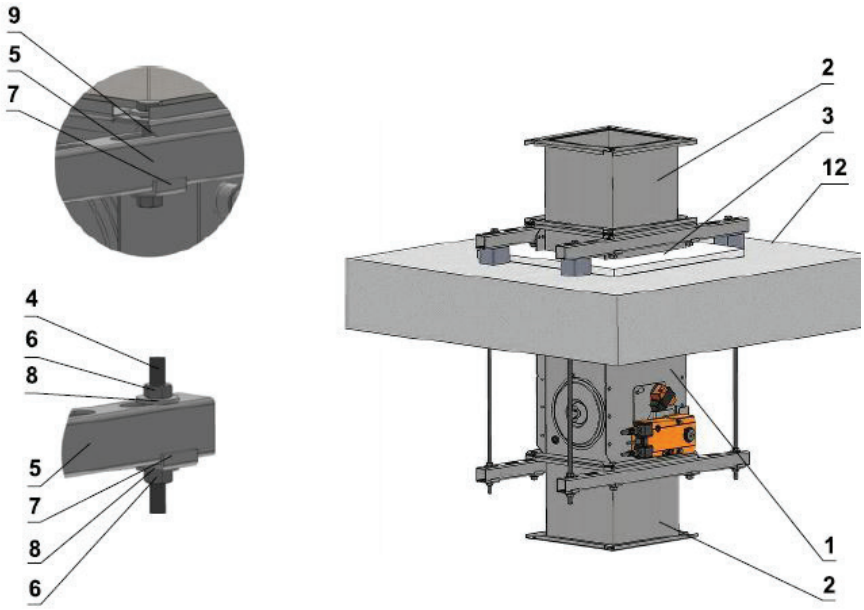
Actuating mechanism is placed above the ceiling construction.



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 rail
12 Fire resistant board

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

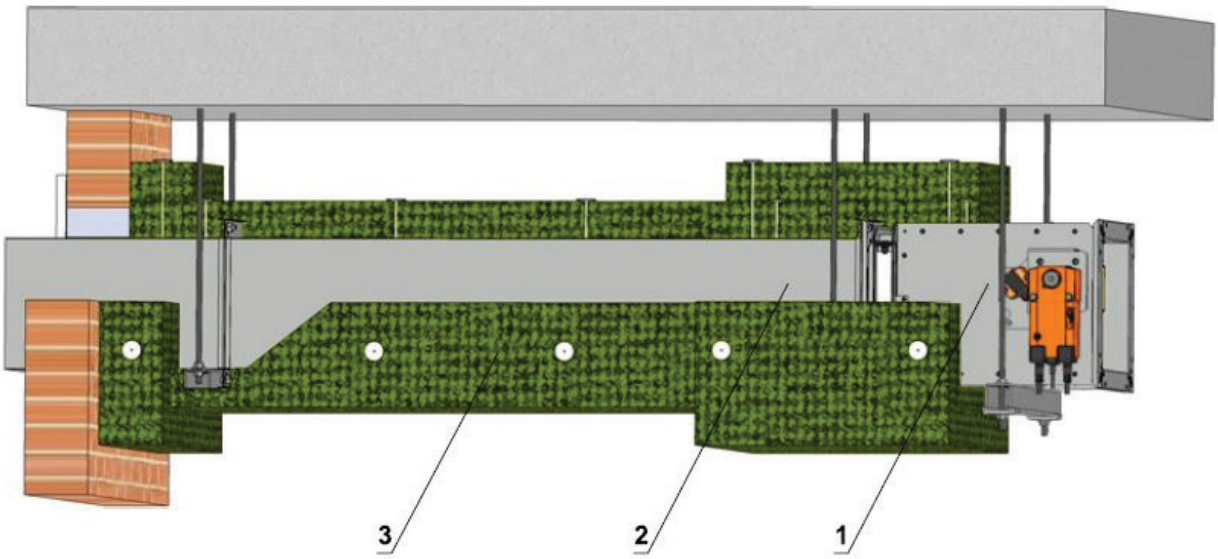


Shown schemes of incorporation and damper are illustrative only!

8.3 Rectangular fire damper suspension on the wall- horizontal installation

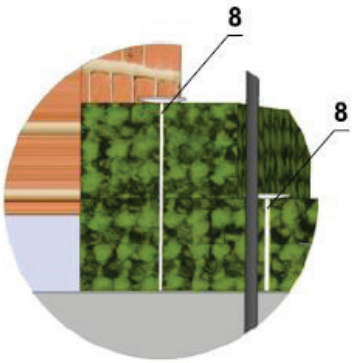
Duct between fire damper and fire separating construction can be suspended by using threaded rods and mounting profiles. Load the suspension system depend on weight of the fire damper and duct system.
Max. length between two suspension systems is 1500 mm.
Damper assembly procedures must be done so as 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. 83
The insulation boards are fastened to the duct by weld pins. Distance between weld pins, distance between weld pins and flanges is dependent on the materials. For more information see documentation of insulation manufacturer.

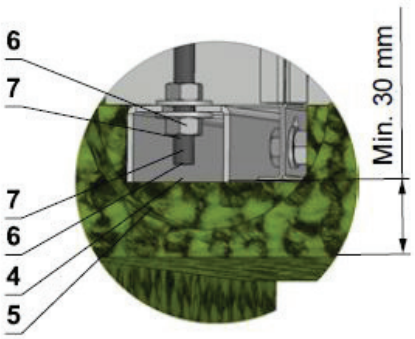
Fig. 52 Suspension on the wall- horizontal installation



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

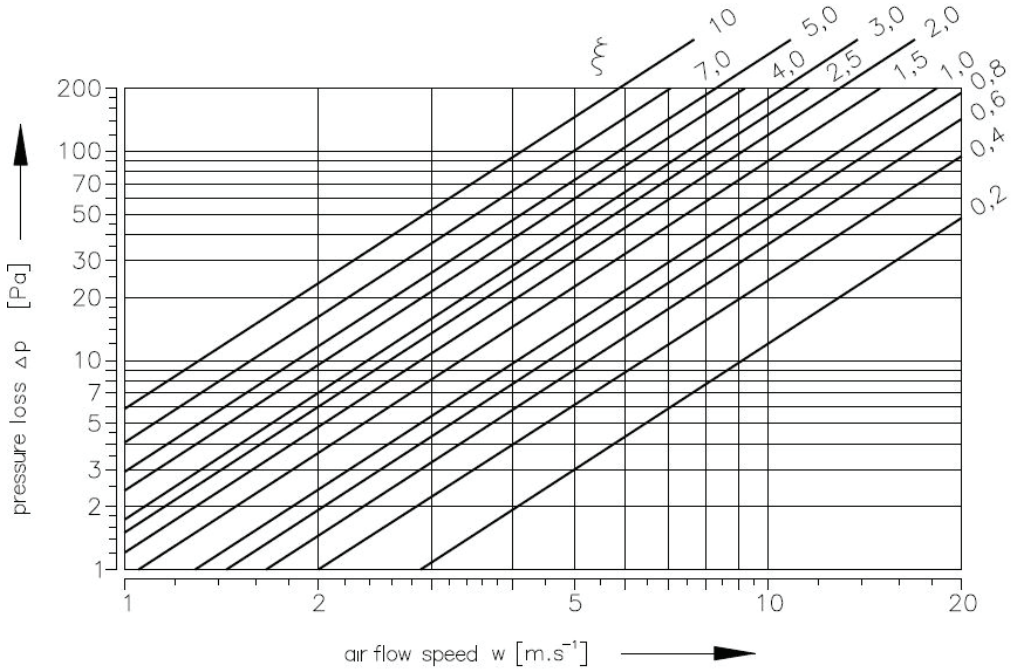
9.1 Pressure loss calculation

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

Δp	[Pa]	pressure lost
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. 11.1.1.)

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 ξ (-)

10.1 Coefficient of local pressure loss ξ (-)

Tab 10.1.1. Coefficient of local pressure loss

A	B											
	160	180	200	225	250	280	300	315	355	400	450	500
160	4,771	3,458	2,717	2,285	1,813	1,538	1,407	1,327	1,165	1,040	2,025	1,874
180	4,102	3,251	2,351	2,016	1,676	1,342	1,221	1,136	0,986	0,922	1,676	1,548
200	3,701	2,951	2,105	1,867	1,554	1,302	1,113	1,052	0,933	0,801	1,445	1,332
225	3,654	2,873	2,056	1,726	1,475	1,226	1,067	1,029	0,917	0,781	1,239	1,172
250	3,588	2,793	2,005	1,675	1,386	1,155	1,033	0,987	0,893	0,736	1,113	1,021
280	3,411	2,692	1,975	1,599	1,341	1,123	0,986	0,916	0,822	0,713	0,996	0,912
300	3,288	2,599	1,903	1,536	1,315	1,101	0,974	0,911	0,787	0,692	0,937	0,857
315	3,102	2,454	1,833	1,489	1,289	0,988	0,933	0,833	0,721	0,634	0,900	0,822
355	2,955	2,302	1,796	1,412	1,199	0,956	0,902	0,799	0,678	0,588	0,821	0,749
400	2,833	2,159	1,703	1,356	1,126	0,931	0,825	0,711	0,635	0,527	0,757	0,689
450	2,732	2,055	1,623	1,302	1,103	0,852	0,777	0,677	0,599	0,507	0,705	0,640
500	2,670	1,988	1,587	1,251	1,025	0,796	0,725	0,618	0,529	0,460	0,666	0,603
550	4,219	2,941	2,237	1,687	1,402	1,156	1,039	0,968	0,827	0,719	0,635	0,575
560	4,194	2,922	2,222	1,623	1,392	1,147	1,031	0,910	0,820	0,713	0,630	0,570
600	4,104	2,857	2,170	1,573	1,357	1,117	1,004	0,935	0,797	0,692	0,611	0,552
630	4,046	2,814	2,137	1,553	1,334	1,098	0,986	0,918	0,782	0,678	0,598	0,540
650	4,010	2,788	2,116	1,526	1,320	1,086	0,975	0,908	0,773	0,670	0,590	0,533
700	3,975	2,759	2,098	1,515	1,297	1,071	0,965	0,892	0,761	0,656	0,581	0,527
710	3,918	2,720	2,062	1,496	1,284	1,055	0,947	0,881	0,749	0,648	0,571	0,515
750	3,865	2,682	2,032	1,475	1,264	1,037	0,931	0,866	0,736	0,636	0,560	0,504
800	3,808	2,640	1,999	1,445	1,241	1,018	0,913	0,849	0,721	0,623	0,547	0,493
900	3,715	2,572	1,946	1,414	1,205	0,988	0,885	0,822	0,697	0,602	0,528	0,474
1000	3,643	2,519	1,904	1,395	1,177	0,964	0,863	0,801	0,679	0,585	0,512	0,460

A	B										
	550	560	600	630	650	700	710	750	800	900	1000
160	1,761	1,741	1,672	1,627	1,601	1,598	1,532	1,493	1,452	1,386	1,336
180	1,451	1,434	1,375	1,337	1,315	1,289	1,256	1,224	1,18	1,133	1,09
200	1,246	1,232	1,179	1,146	1,126	1,106	1,074	1,046	1,015	0,965	0,928
225	1,075	1,035	0,998	0,965	0,938	0,926	0,905	0,873	0,856	0,822	0,803
250	0,952	0,94	0,898	0,871	0,855	0,831	0,813	0,79	0,765	0,725	0,695
280	0,849	0,88	0,8	0,775	0,76	0,742	0,722	0,701	0,678	0,641	0,613
300	0,797	0,786	0,75	0,726	0,712	0,689	0,675	0,655	0,633	0,599	0,572
315	0,764	0,754	0,718	0,695	0,681	0,662	0,646	0,626	0,605	0,572	0,546
355	0,694	0,685	0,651	0,63	0,617	0,603	0,584	0,566	0,546	0,514	0,49
400	0,637	0,628	0,597	0,577	0,565	0,543	0,534	0,516	0,498	0,468	0,445
450	0,591	0,583	0,553	0,534	0,522	0,503	0,493	0,476	0,458	0,43	0,408
500	0,556	0,548	0,52	0,501	0,49	0,482	0,462	0,446	0,429	0,401	0,38
550	0,529	0,521	0,494	0,476	0,465	0,441	0,437	0,422	0,405	0,379	–
560	0,524	0,517	0,489	0,471	0,461	0,448	0,433	0,418	0,401	–	–
600	0,507	0,5	0,473	0,455	0,445	0,426	0,418	0,403	0,387	–	–
630	0,496	0,489	0,462	0,445	0,435	0,418	0,408	0,393	–	–	–
650	0,49	0,482	0,456	0,439	0,428	0,414	0,402	0,387	–	–	–
700	0,483	0,476	0,444	0,431	0,421	0,409	0,398	0,379	–	–	–
710	0,472	0,465	0,439	0,422	0,412	0,399	–	–	–	–	–
750	0,462	0,455	0,429	0,413	0,403	–	–	–	–	–	–
800	0,451	0,444	0,419	–	–	–	–	–	–	–	–
900	0,434	–	–	–	–	–	–	–	–	–	–

IX. Technical data

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. 12.3.1.)
S	[m²]	duct cross section
K_A	[dB]	correction to the weight filter A (viz Tab. 12.3.2.)

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. 11.3.2.)

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]	[-]														
	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
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
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
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
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
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
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
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
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
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
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
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

Tab 11.3.3. 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 11.3.4. 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

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 are galvanised without further surface treatment.
Springs are galvanized.
Fasteners are 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 30 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 Dampers are transported by box freight vehicles without direct weather impact, there must not occur any sharp shocks and ambient temperature must not exceed +40°C. Dampers must be protected against mechanic damages when transported and manipulated.
During transportation, the damper blade must be in the "CLOSED" position.

14.2 Dampers are stored indoor in environment without any aggressive vapours, gases or dust. Indoort emperature must be in the range from -30°C to +40°C and maximum relative humidity 95 % (avoid condensation on the damper body). Dampers must be protected against mechanic damages when transported and manipulated.

Assembly, attendance, maintenance and revisions

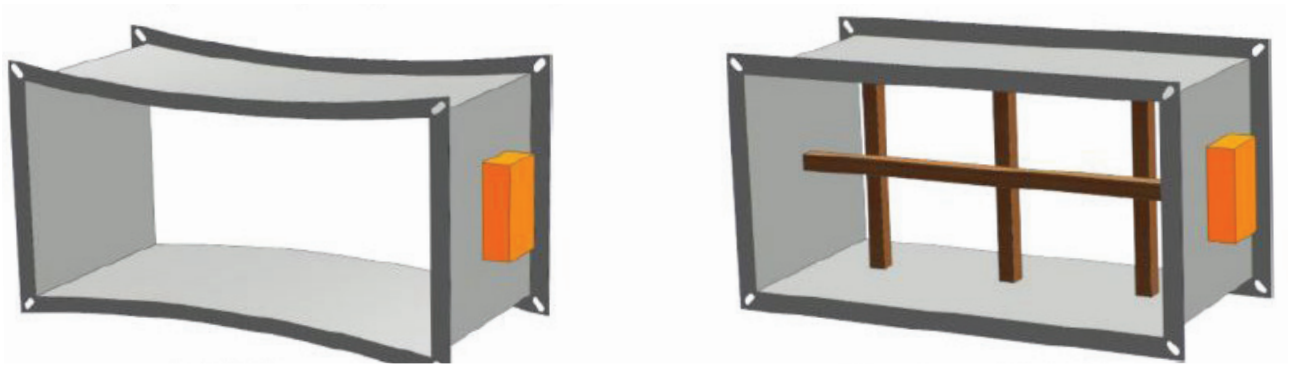
15. Assembly

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

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

Fig. 53 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**

15.3 To ensure reliable fire damper function it is necessary to avoid blocking the closing mechanism and contact surfaces with collected dust, fibre and sticky materials and solvents.

Material, finishing

16. Entry into service and revisions

16.1 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.
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.

16.2 Before entering the dampers with actuating mechanism into operation after their assembly and by sequential checks and following checks must be carried out.
Check of blade displacement into the breakdown position "CLOSED" can be done after cutting off the actuating mechanism supply (e.g. by pressing the RESET button at the thermoelectrical starting mechanism BAT or cutting off the supply from ELECTRICAL FIRE SIGNALISATION). Check of blade displacement back into the "OPEN" position can be done after restoration of power supply (e.g. By releasing the RESET button or restoration of supply from ELECTRICAL FIRE SIGNALISATION).

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

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

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

16.6 Dampers could be displaced into position “CLOSED” only in case that ventilator, or Air Handling Unit is switched off. The goal is the securing of proper closing and safe function of Fire Damper in case of Fire.

17. Spare parts

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

17.2 Control for square damper and round damper is identical.

18. Restore function of actuating mechanism after fuses initiation

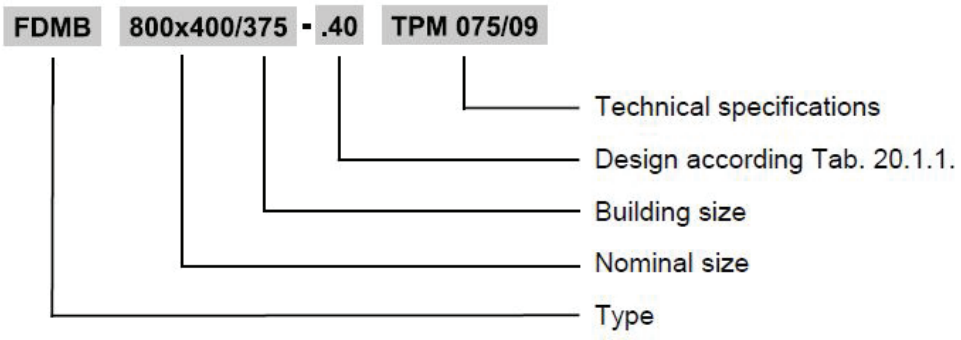
18.1 If fuse Tf1 is initiated (duct outside temperature) than is necessary to change thermoelectrical starting mechanism BAT72B-S. Whereas is initiation temperature higher than actuator mechanism operating temperature +50°C, recommended actuating mechanism manufacturer make complete revision or change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

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

Ordering information

19. Ordering key

19.1 Fire damper



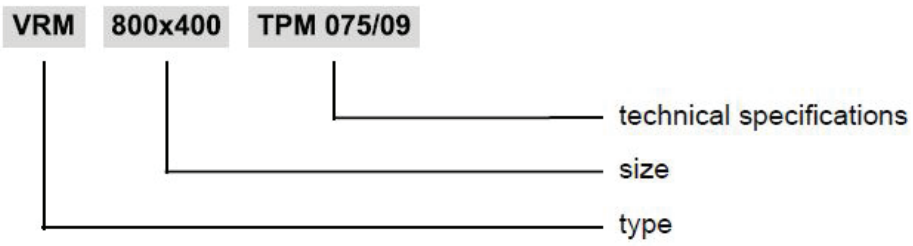
If installation holders, installation frame or design for installation in Weichschott system are requested, it has to be mentioned separately in the order. Installation frame could be fixed to the damper body or supplied separately.

Tab 19.1.1. Dampers design

Dampers design	Additional digit
With actuating mechanism BF 230-TN (BFL, BFN 230-T) - voltage AC 230 V	.40
With actuating mechanism BF 24-TN (BFL, BFN 24-T) - voltage AC/DC 24 V	.50

Some designs are possible to supply with optical smoke detector ORS 142 K.
For more information contact manufacturer.

Tab 19.1.2.Reinforcement - damper placement outside wall or ceiling construction



19.2 Data label is placed on the damper body.

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