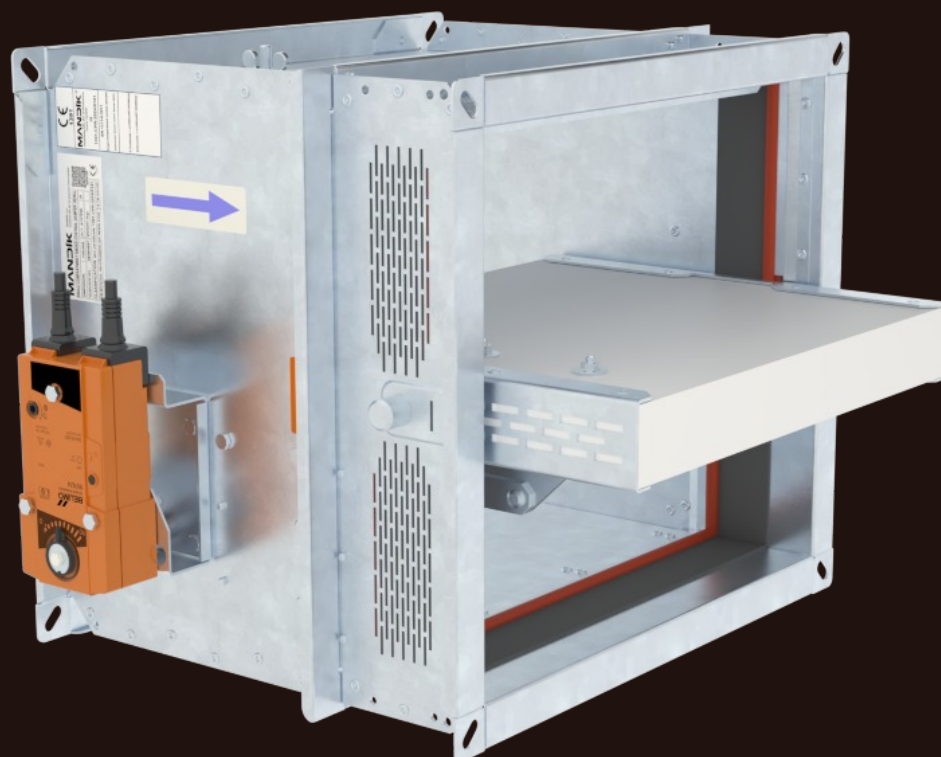


MSD

Multi compartment smoke control damper

Technical Documentation

Installation, Commissioning, Operation, Maintenance and Service Manual



These technical specifications state a row of manufactured sizes and models of Multi compartment smoke control damper MSD. It is valid for production, designing, ordering, delivery, maintenance and operation.

CONTENT

I. GENERAL.....3

 Description.....3

II. DESIGN.....4

 Design with actuating mechanism.....4

 Communication and control module MDCM.....9

 Communication and control module MDPM.....9

III. DIMENSIONS.....10

 Technical parameters.....12

IV. INSTALLATION.....17

 Placement and installation.....17

 Statement of installations.....18

 Installation in solid wall construction SINGLE / MULTI.....19

 Installation in gypsum wall SINGLE / MULTI.....22

 Installation in solid ceiling construction SINGLE / MULTI.....25

 Installation in solid ceiling construction MULTI / MULTI.....26

V. SUSPENSION SYSTEMS.....27

 Example of duct connection.....31

 MSD installed in fire separating construction and connection to steel duct.....32

 MSD installed in steel duct with insulation.....38

VI. TECHNICAL DATA.....39

 Pressure loss.....39

 Noise data.....41

VII. MATERIAL, FINISHING.....42

VIII. TRANSPORTATION AND STORAGE.....42

 Logistic terms.....42

IX. ASSEMBLY, ATTENDANCE AND MAINTENANCE.....43

 Electrical connection of the actuator in protection box.....43

 Connection of the control module MDPM & MDCM interfaces inside protection box.....44

 Entry into service and revisions.....45

X. ORDERING INFORMATION.....46

 Ordering key.....46

 Methods of damper installation, according to design.....47

 Data label.....48

I. GENERAL

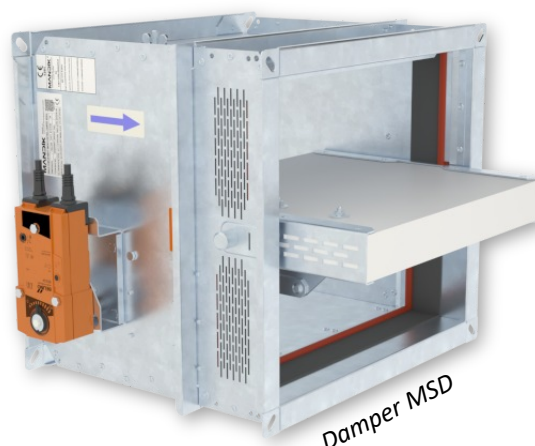
Description

Dampers - MSD are designed into an inlet or extract smoke ventilation system. The dampers are designed either to close to provide compartmentalization or to open (for fresh air inlet) or to allow removal of the heat and combustible products from a fire in the affected fire zone/compartment.

The damper blade is controlled by electrical actuating mechanism.

Dampers are fire resistant and are intended for systems with automatic activation.

Dampers are designed for using in fire compartments that can be connected to the smoke exhaust ducts (tested according to BS EN 1366-8) or they can be installed in or on the construction of the fire compartment.



Damper characteristics

- CE certified acc. to BS EN 12101-8
- Tested in accordance with BS EN 1366-10
- Classified acc. to BS EN 13501-4
- External Casing leakage class min. ATC 3 (old marking "C") acc. to BS EN 1751
- Internal leakage min. class 2, for max. dimension 1500 x 800 mm min. class 3 acc. to BS EN 1751
- Cycling test in class C_{mod} acc. to BS EN 12101-8
- Certificate of constancy of performance UKCA No. 2822-UKCA-CPR-XXXX
- Certificate of constancy of performance CE No. 1391-CPR-XXXX/XXXX
- Declaration of Performance UKCA No. PM/MSD/02/XX/X
- Declaration of Performance CE No. PM/MSD/01/XX/X
- Hygienic assessment - Report No. 1.6/pos/19/19b

Classification of Dampers

Supporting construction	Installation type / system	Classification
Horizontal or vertical duct system	Damper installed into a duct	EI 120 (v_{ed} - h_{od} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti
	Damper installed on the end of a duct with grille	
Solid wall construction - 125 mm min. wall thickness	Mortar or gypsum	EI 120 (v_{ew} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti
Solid wall construction - 100 mm min. wall thickness	Ablative Coated Batt	EI 90 (v_{ew} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti
Gypsum plasterboard wall - 125 mm min. wall thickness	Mortar or gypsum	EI 120 (v_{ew} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti
Gypsum plasterboard wall - 100 mm min. wall thickness	Ablative Coated Batt	EI 90 (v_{ew} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti
Solid ceiling construction - 150 mm min. ceiling thickness	Mortar or gypsum	EI 120 (h_{ow} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti
	Ablative Coated Batt	EI 90 (h_{ow} $i \leftrightarrow o$) S1500C _{mod} HOT400/30AAmulti

Working conditions

- Exact damper function is provided under the following conditions
 - maximum air velocity 15 m/s
 - underpressure max. -1500 Pa or overpressure max. 500 Pa
- Dampers can be installed in arbitrary position (horizontal or vertical blade axis).
- Dampers are designed for macroclimatic areas with mild climate according to BS EN IEC 60 721-3-3 ed.2., class 3K22.
- Temperature in the place of installation is permitted to range from -30°C to +50°C.

II. DESIGN

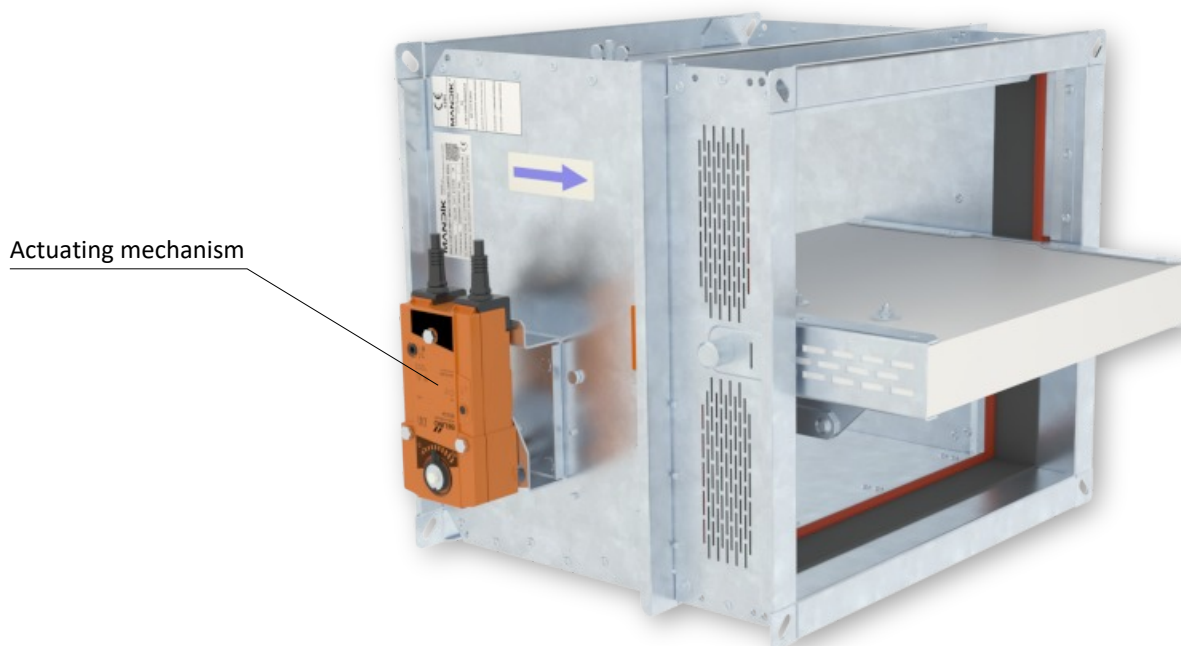
Design with actuating mechanism

Design .44 and .54

- Belimo actuators are used for dampers, series BEN, BEE, BE for 230V AC resp. 24 V AC/DC, Schischek InMax 50.75-S actuators (universal 24V or 230V supply) are used for large size of dampers.
- After connection to the power supply voltage, the actuator moves the damper blade to the "OPEN" position or "CLOSED" (according to the corresponding connection, see wiring diagram). If the power supply is interrupted, the actuator stops at the current position. The signalling of the "OPEN" and "CLOSED" damper blade positions is ensured by two built-in fixed "potential-free" end- limit switches.
- The actuator for operating the damper blade is mounted in an insulated cover/box. It is accessible after removing the cover lid. The electrical connection of the actuator is made with a non-flammable cable (or a cable located in the adjoining cable duct), which passes through an opening made in the wall of the insulated cover/box when installing the damper or when connecting the actuator power cable. The power and control cable must be CAT 3 as BS EN8519.

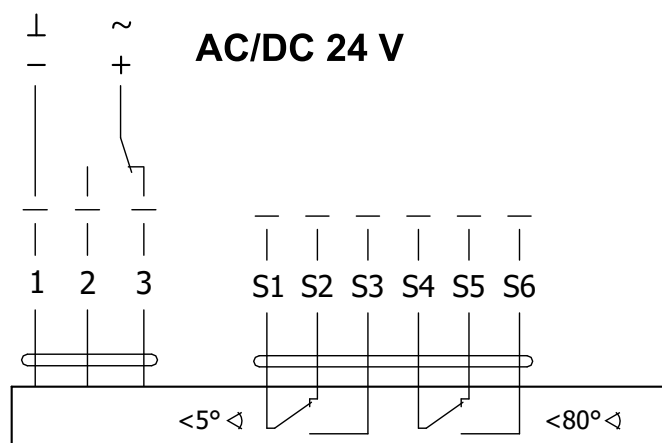
Design .65

- Belimo modulating actuators, BEN (BEE)-SR series for 24V AC/DC are specially designed for remote control of smoke control dampers. The position of the damper blade is adjustable by means of control voltage 0 (2)...10V DC.
 - The signalling of the "OPEN" and "CLOSED" damper blade positions is ensured by two built-in fixed "potential-free" limit switches.
 - The actuator for operating the damper blade is mounted in an insulated cover/box. It is accessible after removing
- the cover lid. The electrical connection of the actuator is made with non-flammable cables (or cables located in the adjoining cable duct), which pass through an opening made in the wall of the insulated cover when installing the damper or when connecting the power cables of the actuator. The power and control cable must be CAT 3 as BS EN8519.

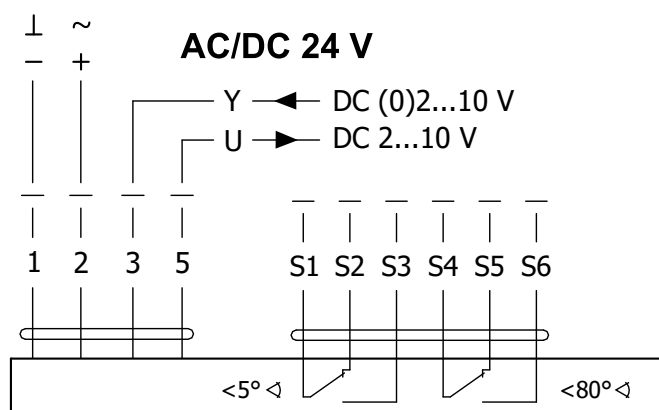


Design .44, .54 and .65

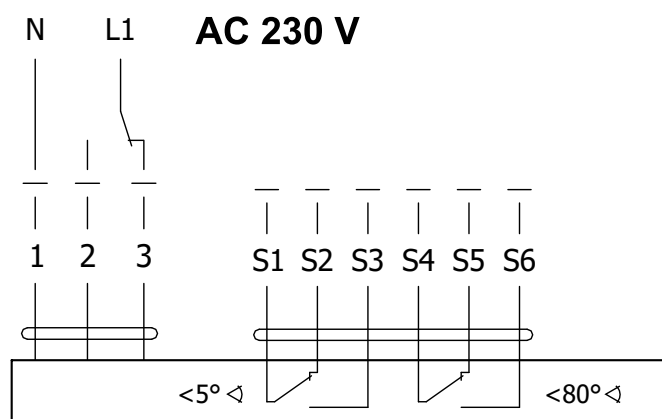
Actuator BELIMO BEN 24(-ST)



Actuator BELIMO BEN 24-SR



Actuator BELIMO BEN 230



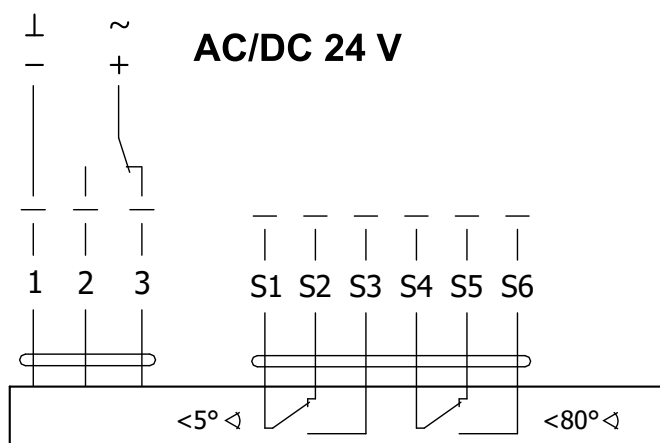
Extended leads are not possible with smoke control dampers as the belimo cables are not fire rated to a high Field wiring must be brought into and terminated within the damper housing. For more detail → see pages 43 to 44, paragraph Assembly.

Actuator BELIMO BEN 24(-ST), BEN 24-SR, BEN 230

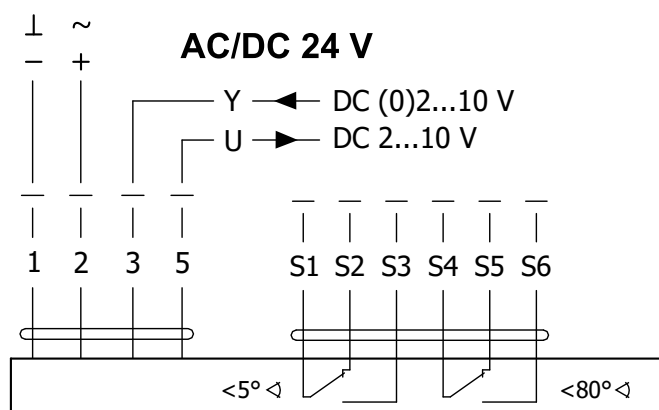
Actuator BELIMO - 15 Nm	BEN 24(-ST)	BEN 24-SR*	BEN 230
Power voltage	AC/DC 24 V 50/60Hz	AC/DC 24 V 50/60Hz	AC 230 V 50/60Hz
Power consumption - in operation - in the end position	3 W 0,1 W	3 W 0,3 W	4 W 0,4 W
Dimensioning	6 VA (Imax 8,2 A @ 5 ms)	6,5 VA (Imax 8.2 A @ 5 ms)	7 VA (Imax 4 A @ 5 ms)
Protection class	III	III	II
Degree of protection		IP 54	
Adjustment time for 95°		< 30 s	
Ambient temperature		-30°C ... +55°C	
Storage temperature		-40°C ... +80°C	
Connection - drive - auxiliary switch	Cable 1 m, 3 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ² (BEN 24-ST) with plug connectors	Cable 1 m, 4 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ²	Cable 1 m, 3 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ²

* Only available for 24V and selected damper sizes

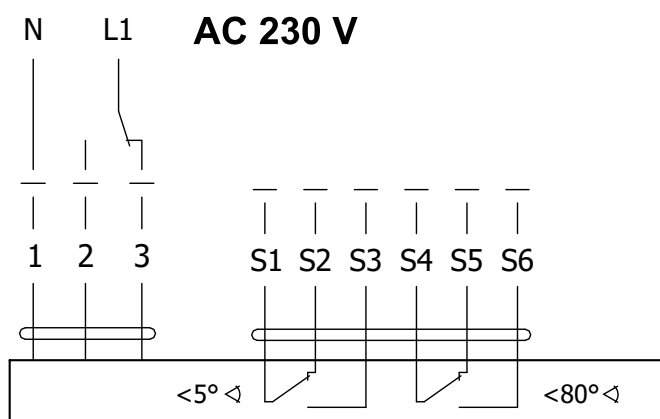
Actuator BELIMO BEE 24(-ST)



Actuator BELIMO BEE 24-SR



Actuator BELIMO BEE 230



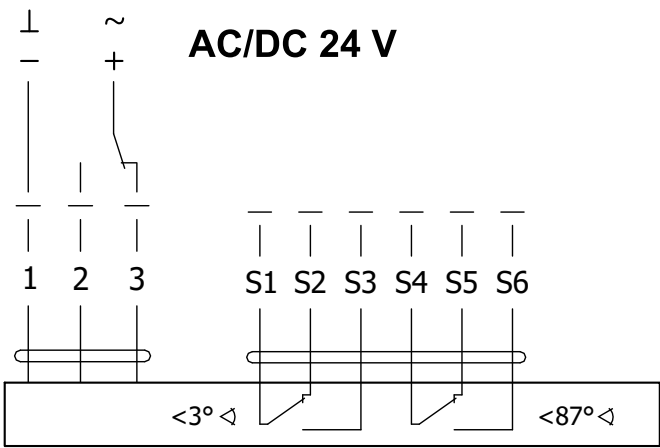
Extended leads are not possible with smoke control dampers as the belimo cabls are not fire rated to a high Field wiring must be brought into and terminated within the damper housing. For more detail → see pages 43 to 44, paragraph Assembly.

Actuator BELIMO BEE 24(-ST), BEE 24-SR, BEE 230

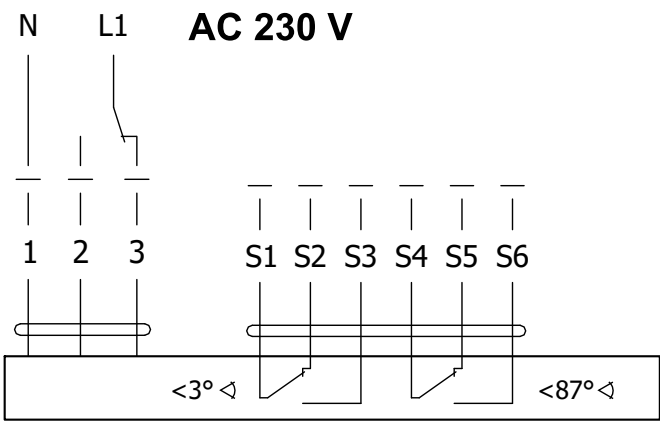
Actuator BELIMO - 25 Nm	BEE 24(-ST)	BEE 24-SR*	BEE 230
Power voltage	AC/DC 24 V 50/60Hz	AC/DC 24 V 50/60Hz	AC 230 V 50/60Hz
Power consumption - in operation - in the end position	2,5 W 0,1 W	3 W 0,3 W	3,5 W 0,4 W
Dimensioning	5 VA (Imax 8,2 A @ 5 ms)	5,5 VA (Imax 8.2 A @ 5 ms)	6 VA (Imax 4 A @ 5 ms)
Protection class	III	III	II
Degree of protection		IP 54	
Adjustment time for 95°		< 60 s	
Ambient temperature		-30°C ... +55°C	
Storage temperature		-40°C ... +80°C	
Connection - drive - auxiliary switch	Cable 1 m, 3 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ² (BEE 24-ST) with plug connectors	Cable 1 m, 4 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ²	Cable 1 m, 3 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ²

* Only available for 24V and selected damper sizes

Actuator BELIMO BE 24-12(-ST)



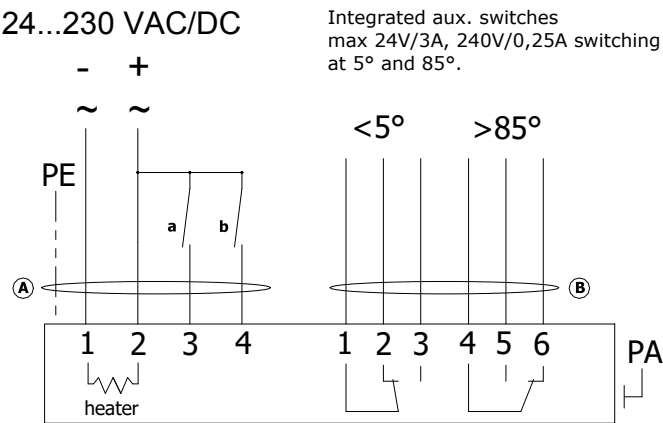
Actuator BELIMO BE 230-12



Extended leads are not possible with smoke control dampers as the belimo cabls are not fire rated to a high Field wiring must be brought into and terminated within the damper housing. For more detail → see pages 43 to 44, paragraph Assembly.

Actuator BELIMO BE 24-12(-ST), BE 230-12		
Actuator BELIMO - 40 Nm	BE 24-12(-ST)	BE 230-12
Power voltage	AC/DC 24 V 50/60Hz	AC 230 V 50/60Hz
Power consumption - in operation - in the end position	12 W 0,5 W	8 W 0,5 W
Dimensioning	18 VA (Imax 8,2 A @ 5 ms)	15 VA (Imax 7.9 A @ 5 ms)
Protection class	III	II
Degree of protection	IP 54	
Adjustment time for 95°	< 60 s	
Ambient temperature	-30°C ... +55°C	
Storage temperature	-40°C ... +80°C	
Connection - drive - auxiliary switch	Cable 1 m, 3 x 0,75 mm ² Cable 1 m, 6 x 0,75 mm ² (BE 24-ST) with plug connectors	

Actuator SCHISCHEK InMax 50.75-S

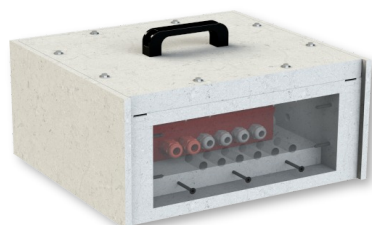


Extended leads are not possible with smoke control dampers as the belimo cabls are not fire rated to a high Field wiring must be brought into and terminated within the damper housing. For more detail → see pages 43 to 44, paragraph Assembly.

Actuator SCHISCHEK InMax 50.75-S	
Actuator SCHISCHEK	InMax 50.75-S
Power voltage	24-240 VAC/DC 50/60Hz
Power consumption - motoring - heating	10 W 16 W (start at -20°C)
Protection class	I
Degree of protection	IP 66
Adjustment time for 95°	< 60 s
Ambient temperature	-40°C ... +50°C
Storage temperature	-40°C ... +70°C
Connection	Cable 1 m, 0,5 mm²

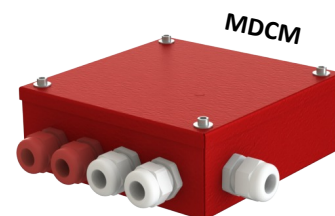
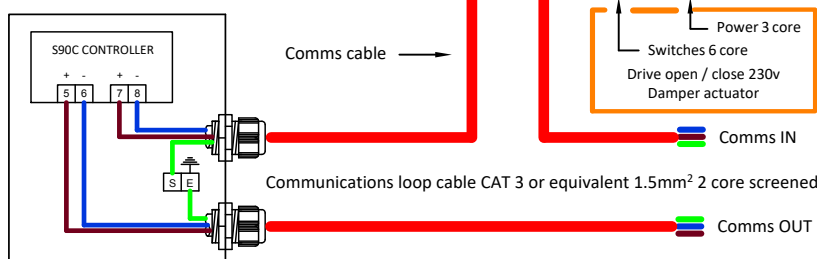
Communication and control module MDCM

- The MDCM damper control module is connected on a bi directional communication loop back to a control panel, typically located at the FCC.
- Each MDCM has a 230v local spur to power the damper actuator.
- Max terminal size in MDCM and MDPM 2.5mm²
- Up to 96x MDCM's can be connected on one loop and multiple loops can be incorporated.
- With an MA or AA system the MDCM's are mounted in a fire rated and tested Ca-Si housing to BS EN1366-10.



Details of connection of the control module interfaces inside protection box → see page 44

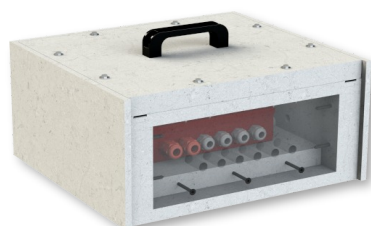
S90 mounted in an addressable smoke control damper control panel to BS ISO 21927-9



160mm x 160mm x 62mm deep steel enclosure powder coated red - IP54

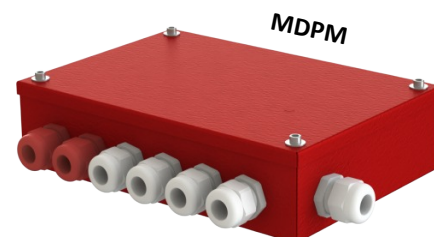
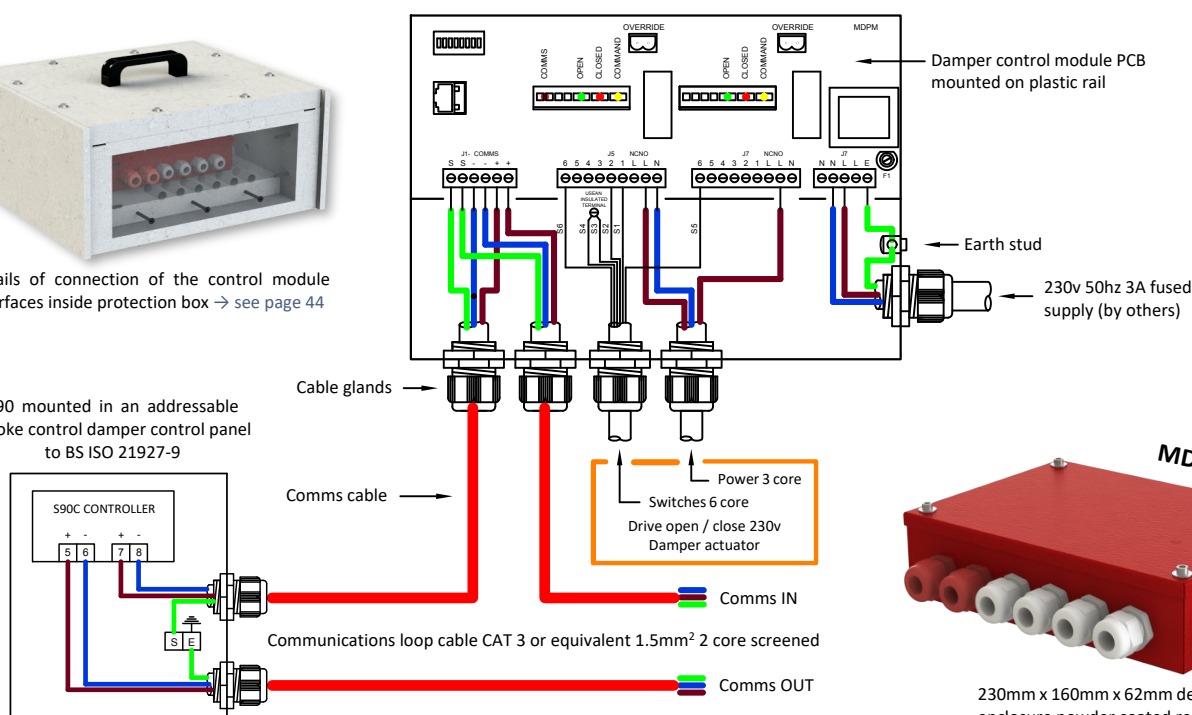
Communication and control module MDPM

- The MDPM damper control module is a combined control module and damper positioning module to provide a balanced/3R position.
- It is connected on a bi directional communication loop back to a control panel.
- Max terminal size in MDCM and MDPM 2.5mm²
- Each MDPM has a 230v local spur for powering the damper actuator, located at the FCC.
- Up to 96x MDPM's can be connected on one loop and multiple loops can be incorporated.
- With an MA or AA system the MDPM's are mounted in a fire rated and tested Ca-Si housing to BS EN1366-10.



Details of connection of the control module interfaces inside protection box → see page 44

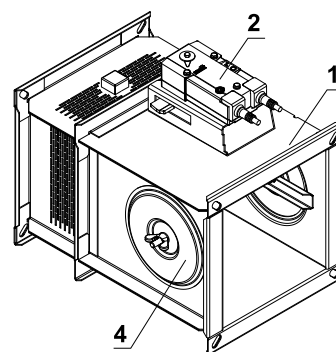
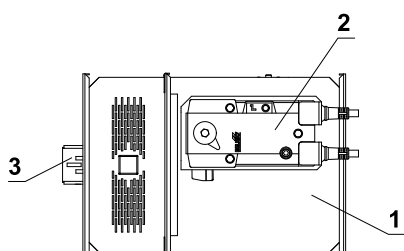
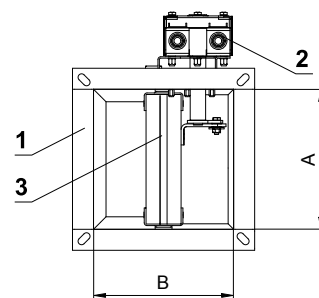
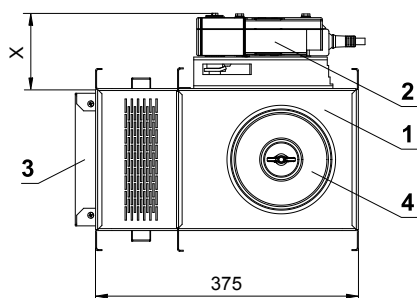
S90 mounted in an addressable smoke control damper control panel to BS ISO 21927-9



230mm x 160mm x 62mm deep steel enclosure powder coated red - IP54

III. DIMENSIONS

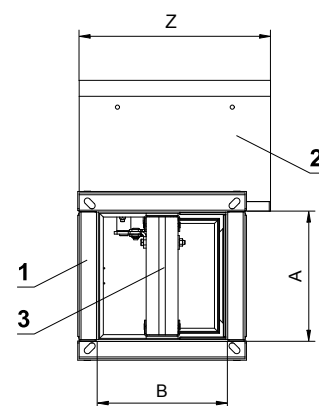
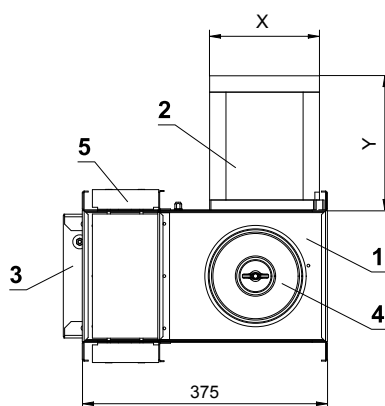
MSD with actuating mechanism



X = 94mm - BEN
98mm - BEE
115,2mm - BE
151mm - SCHISCHEK

- 1 MSD - design „A“ → see pages 46 to 47
- 2 Actuating mechanism
- 3 Damper blade
- 4 Access door/ inspection cover

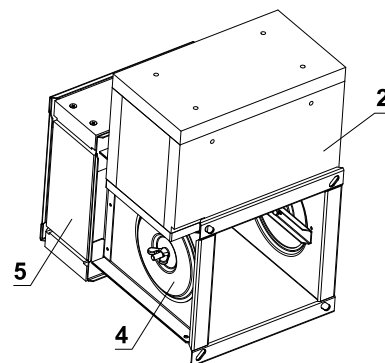
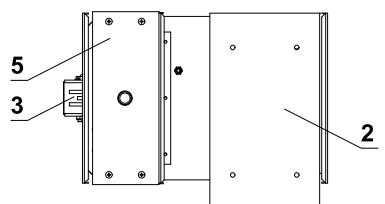
MSD with actuating mechanism, protective cladding boards and insulation box



X = 168mm - BEN (BEE)
171mm - BE
220mm - SCHISCHEK

Y = 250mm - BEN (BEE)
260mm - BE
260mm - SCHISCHEK

Z = 300mm - BEN (BEE)
370mm - BE
430mm - SCHISCHEK



- 1 MSD - design „IB1“ → see pages 46 to 47
- 2 Insulation box
- 3 Damper blade
- 4 Access door/ inspection cover
- 5 Protective cladding boards

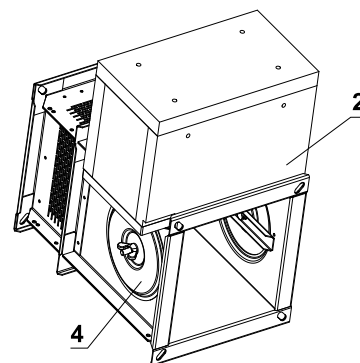
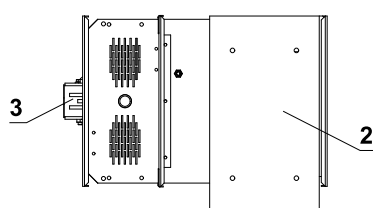
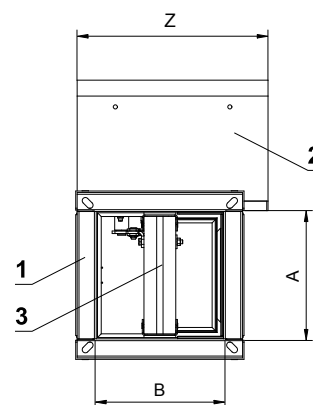
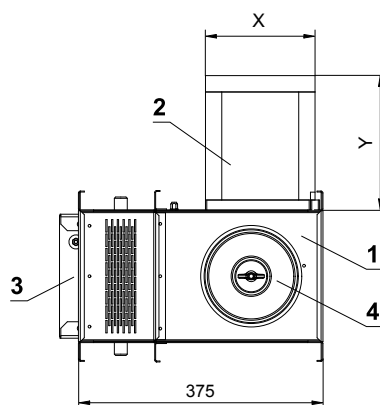
MSD with actuating mechanism and insulation box

X = 168mm - BEN (BEE)
 171mm - BE
 220mm - SCHISCHEK

Y = 250mm - BEN (BEE)
 260mm - BE
 260mm - SCHISCHEK

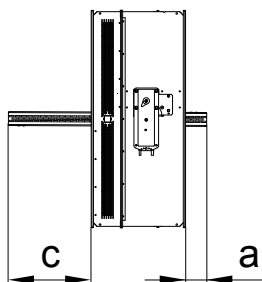
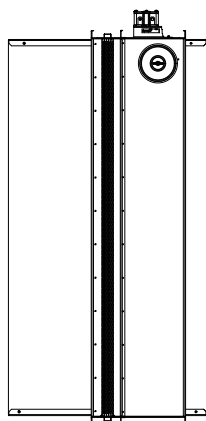
Z = 300mm - BEN (BEE)
 370mm - BE
 430mm - SCHISCHEK

- 1 MSD - design „IB“ → see pages 46 to 47
- 2 Insulation box
- 3 Damper blade
- 4 Access door/ inspection cover

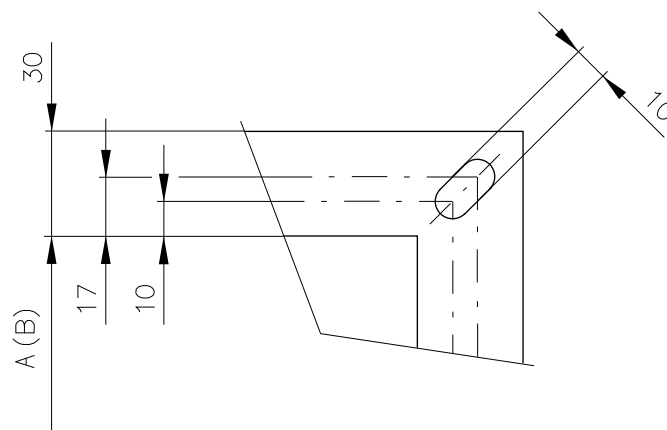


Damper blade overlaps

- Open damper blade overlaps the damper body by the value "c" or "a" and "c". These values are specified in chapter Technical parameters → see pages 12 to 16.



Flange with corner hole



Flanges of dampers are 30 mm wide with oval hole.

Values "a" and "c" has to be respected when projecting related smoke exhaust ducts.

Technical parameters

A x B [mm]	Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type	A x B [mm]	Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type
	a [mm]	c [mm]					a [mm]	c [mm]			
160 x	180	–	19	0,0162	12,2	200 x	600	–	229	0,0984	22,4
	200	–	29	0,0191	12,6		630	–	244	0,1040	23,1
	225	–	41,5	0,0228	13,1		650	9	254	0,1077	23,5
	250	–	54	0,0264	13,6		700	34	279	0,1169	24,6
	280	–	69	0,0307	14,3		710	39	284	0,1188	24,9
	300	–	79	0,0336	14,7		750	59	304	0,1262	25,8
	315	–	86,5	0,0358	15		800	84	329	0,1354	26,9
	355	–	106,5	0,0416	15,8	225 x	180	–	19	0,0235	13,4
	400	–	129	0,0481	16,8		200	–	29	0,0277	13,8
	450	–	154	0,0554	17,8		225	–	41,5	0,0330	14,4
	500	–	179	0,0626	18,8		250	–	54	0,0382	15
	550	–	204	0,0699	19,9		280	–	69	0,0445	15,7
	560	–	209	0,0713	20,1		300	–	79	0,0487	16,2
	600	–	229	0,0771	20,9		315	–	87	0,0519	16,6
	630	–	244	0,0815	21,5		355	–	86,5	0,0603	17,5
	650	9	254	0,0844	21,9		400	–	106,5	0,0697	18,6
	700	34	279	0,0916	23		450	–	154	0,0802	19,7
	710	39	284	0,0931	23,2		500	–	179	0,0907	20,9
	750	59	304	0,0989	24		550	–	204	0,1012	22,1
	800	84	329	0,1061	25		560	–	209	0,1033	22,3
180 x	180	–	19	0,0185	12,6	250 x	600	–	229	0,1117	23,3
	200	–	29	0,0218	13		630	–	244	0,1180	24
	225	–	41,5	0,0259	13,5		650	9	254	0,1222	24,4
	250	–	54	0,0300	14,1		700	34	279	0,1327	25,6
	280	–	69	0,0350	14,7		710	39	284	0,1348	25,9
	300	–	79	0,0383	15,2		750	59	304	0,1432	26,8
	315	–	86,5	0,0408	15,5		800	84	329	0,1537	28
	355	–	106,5	0,0474	16,3		180	–	19	0,0263	13,8
	400	–	129	0,0548	17,3		200	–	29	0,0310	14,3
	450	–	154	0,0630	18,4		225	–	41,5	0,0369	14,9
	500	–	179	0,0713	19,5		250	–	54	0,0428	15,6
	550	–	204	0,0795	20,6		280	–	69	0,0498	16,3
	560	–	209	0,0812	20,8		300	–	79	0,0545	16,8
	600	–	229	0,0878	21,6		315	–	86,5	0,0580	17,1
	630	–	244	0,0927	22,3		355	–	106,5	0,0674	18,1
	650	9	254	0,0960	22,7		400	–	129	0,0780	19,2
200 x	700	34	279	0,1043	23,8		450	–	154	0,0898	20,4
	710	39	284	0,1059	24		500	–	179	0,1015	21,7
	750	59	304	0,1125	24,9		550	–	204	0,1133	22,9
	800	84	329	0,1208	26		560	–	209	0,1156	23,1
	180	–	19	0,0207	12,9		600	–	229	0,1250	24,1
	200	–	29	0,0244	13,4		630	–	244	0,1321	24,8
	225	–	41,5	0,0290	13,9		650	9	254	0,1368	25,3
	250	–	54	0,0337	14,5		700	34	279	0,1485	26,6
	280	–	69	0,0392	15,2		710	39	284	0,1509	26,8
	300	–	79	0,0429	15,6		750	59	304	0,1603	27,8
	315	–	86,5	0,0457	16		800	84	329	0,1720	29
	355	–	106,5	0,0531	16,9	280 x	180	–	19	0,0297	14,4
	400	–	129	0,0614	17,9		200	–	29	0,0350	14,9
	450	–	154	0,0707	19		225	–	41,5	0,0416	15,5
	500	–	179	0,0799	20,1		250	–	54	0,0482	16,2
	550	–	204	0,0892	21,3		280	–	69	0,0562	16,9
	560	–	209	0,0910	21,5		300	–	79	0,0615	17,5

Sizes listed within the maximum/minimum sizes can be manufactured on request.

A x B [mm]	Damper blade overlaps		Effective area Sef [m ²]	Weight [kg]	Actuating mechanism type	A x B [mm]	Damper blade overlaps		Effective area Sef [m ²]	Weight [kg]	Actuating mechanism type
	a [mm]	c [mm]					a [mm]	c [mm]			
280 x	315	–	86,5	0,0655	17,8	355 x	200	–	29	0,0449	16,3
	355	–	106,5	0,0761	18,9		225	–	41,5	0,0534	17
	400	–	129	0,0880	20		250	–	54	0,0619	17,7
	450	–	154	0,1012	21,3		280	–	69	0,0721	18,6
	500	–	179	0,1145	22,6		300	–	79	0,0789	19,2
	550	–	204	0,1277	23,8		315	–	86,5	0,0840	19,6
	560	–	209	0,1304	24,1		355	–	106,5	0,0976	20,7
	600	–	229	0,1410	25,1		400	–	129	0,1129	22
	630	–	244	0,1489	25,9		450	–	154	0,1299	23,4
	650	9	254	0,1542	26,4		500	–	179	0,1469	24,8
	700	34	279	0,1675	27,7		550	–	204	0,1639	26,2
	710	39	284	0,1701	27,9		560	–	209	0,1673	26,5
	750	59	304	0,1807	28,9		600	–	229	0,1809	27,6
	800	84	329	0,1940	30,2		630	–	244	0,1911	28,5
300 x	180	–	19	0,0319	14,7	400 x	650	9	254	0,1979	29
	200	–	29	0,0376	15,3		700	34	279	0,2149	30,5
	225	–	41,5	0,0447	15,9		710	39	284	0,2183	30,7
	250	–	54	0,0519	16,6		750	59	304	0,2319	31,9
	280	–	69	0,0604	17,4		800	84	329	0,2489	34,3
	300	–	79	0,0661	17,9		180	–	19	0,0431	16,5
	315	–	86,5	0,0704	18,3		200	–	29	0,0508	17,2
	355	–	106,5	0,0818	19,4		225	–	41,5	0,0604	17,9
	400	–	129	0,0946	20,5		250	–	54	0,0701	18,7
	450	–	154	0,1089	21,8		280	–	69	0,0816	19,6
	500	–	179	0,1231	23,2		300	–	79	0,0893	20,2
	550	–	204	0,1374	24,5		315	–	86,5	0,0951	20,6
	560	–	209	0,1402	24,7		355	–	106,5	0,1105	21,8
	600	–	229	0,1516	25,8		400	–	129	0,1278	23,2
315 x	630	–	244	0,1602	26,6		450	–	154	0,1471	24,7
	650	9	254	0,1659	27,1		500	–	179	0,1663	26,2
	700	34	279	0,1801	28,4		550	–	204	0,1856	27,6
	710	39	284	0,1830	28,7		560	–	209	0,1894	27,9
	750	59	304	0,1944	29,7		600	–	229	0,2048	29,1
	800	84	329	0,2086	31		630	–	244	0,2164	30
	180	–	19	0,0336	15		650	9	254	0,2241	30,6
	200	–	29	0,0396	15,6		700	34	279	0,2433	32,1
	225	–	41,5	0,0471	16,2		710	39	284	0,2472	32,4
	250	–	54	0,0546	16,9		750	59	304	0,2626	33,6
	280	–	69	0,0636	17,7		800	84	329	0,2818	36,1
	300	–	79	0,0696	18,3		180	–	19	0,0487	17,5
	315	–	86,5	0,0741	18,7		200	–	29	0,0574	18,1
	355	–	106,5	0,0861	19,7		225	–	41,5	0,0683	18,9
355 x	400	–	129	0,0996	20,9		250	–	54	0,0792	19,7
	450	–	154	0,1146	22,3		280	–	69	0,0922	20,7
	500	–	179	0,1296	23,6		300	–	79	0,1009	21,3
	550	–	204	0,1446	24,9		315	–	86,5	0,1074	21,8
	560	–	209	0,1476	25,2		355	–	106,5	0,1248	23,1
	600	–	229	0,1596	26,3		400	–	129	0,1444	24,5
	630	–	244	0,1686	27,1		450	–	154	0,1662	26,1
	650	9	254	0,1746	27,6		500	–	179	0,1879	27,6
	700	34	279	0,1896	29		550	–	204	0,2097	29,2
	710	39	284	0,1926	29,2		560	–	209	0,2140	29,5
	750	59	304	0,2046	30,3		600	–	229	0,2314	30,8
	800	84	329	0,2196	31,6		630	–	244	0,2445	31,8
	355 x 180	–	19	0,0381	15,7		650	9	254	0,2532	32,4

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A x B [mm]		Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type	A x B [mm]		Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type
		a [mm]	c [mm]						a [mm]	c [mm]			
450 x	700	34	279	0,2749	34	BELIMO BEN (15 N.m)	550	–	204	0,2627	32,7	BELIMO BEN (15 N.m)	
	710	39	284	0,2793	34,3			–	209	0,2681	33,1		
	750	59	304	0,2967	35,6			–	229	0,2899	34,5		
	800	84	329	0,3184	38,2			–	244	0,3063	35,6		
500 x	180	–	19	0,0543	18,4	BELIMO BEN (15 N.m)	560 x	650	9	254	0,3172	36,3	BELIMO BEN (15 N.m)
	200	–	29	0,0640	19,1			700	34	279	0,3444	38,1	
	225	–	41,5	0,0761	19,9			710	39	284	0,3499	38,4	
	250	–	54	0,0883	20,8			750	59	304	0,3717	40,9	
	280	–	69	0,1028	21,8		600 x	800	84	329	0,3989	42,6	BELIMO BEE (25 N.m)
	300	–	79	0,1125	22,5			180	–	19	0,0655	20,2	BELIMO BEN (15 N.m)
	315	–	86,5	0,1198	23			200	–	29	0,0772	21	
	355	–	106,5	0,1392	24,3			225	–	41,5	0,0918	21,9	
	400	–	129	0,1610	25,8			250	–	54	0,1065	22,9	
	450	–	154	0,1853	27,5			280	–	69	0,1240	24	
	500	–	179	0,2095	29,1			300	–	79	0,1357	24,7	
	550	–	204	0,2338	30,8			315	–	86,5	0,1445	25,3	
	560	–	209	0,2386	31,2			355	–	106,5	0,1679	26,8	
	600	–	229	0,2580	32,5			400	–	129	0,1942	28,4	
	630	–	244	0,2726	33,5			450	–	154	0,2235	30,3	
	650	9	254	0,2823	34,2			500	–	179	0,2527	32,1	
	700	34	279	0,3065	35,8			550	–	204	0,2820	34	
	710	39	284	0,3114	36,2			560	–	209	0,2878	34,4	
	750	59	304	0,3308	37,5			600	–	229	0,3112	35,8	
800	84	329	0,3550	40,2	630	–	244	0,3288	37				
550 x	180	–	19	0,0599	19,3	BELIMO BEN (15 N.m)	630 x	650	9	254	0,3405	37,7	BELIMO BEN (15 N.m)
	200	–	29	0,0706	20			700	34	279	0,3697	39,5	
	225	–	41,5	0,0840	20,9			710	39	284	0,3756	40,9	
	250	–	54	0,0974	21,8			750	59	304	0,3990	42,4	
	280	–	69	0,1134	22,9			800	84	329	0,4282	44,3	
	300	–	79	0,1241	23,6			180	–	19	0,0689	20,7	
	315	–	86,5	0,1321	24,1			200	–	29	0,0812	21,6	
	355	–	106,5	0,1535	25,5			225	–	41,5	0,0966	22,5	
	400	–	129	0,1776	27,1		250	–	54	0,1119	23,5		
	450	–	154	0,2044	28,9		280	–	69	0,1304	24,6		
	500	–	179	0,2311	30,6		300	–	79	0,1427	25,4		
	550	–	204	0,2579	32,4		315	–	86,5	0,1519	26		
	560	–	209	0,2632	32,8		355	–	106,5	0,1765	27,5		
	600	–	229	0,2846	34,2		400	–	129	0,2042	29,2		
	630	–	244	0,3007	35,2		450	–	154	0,2349	31,1		
	650	9	254	0,3114	35,9		500	–	179	0,2657	33		
	700	34	279	0,3381	37,7		550	–	204	0,2964	34,9		
	710	39	284	0,3435	38		560	–	209	0,3026	35,3		
	750	59	304	0,3649	40,5		600	–	229	0,3272	36,8		
	800	84	329	0,3916	42,2		630	–	244	0,3456	38		
560 x	180	–	19	0,0610	19,4	BELIMO BEN (15 N.m)	650 x	650	9	254	0,3579	38,8	BELIMO BEE (25 N.m)
	200	–	29	0,0719	20,2			700	34	279	0,3887	40,7	
	225	–	41,5	0,0856	21,1			710	39	284	0,3948	42,1	
	250	–	54	0,0992	22			750	59	304	0,4194	43,6	
	280	–	69	0,1155	23,1		650 x	800	84	329	0,4502	45,5	BELIMO BE (40 N.m)
	300	–	79	0,1264	23,8			180	–	19	0,0711	21,1	BELIMO BEN (15 N.m)
	315	–	86,5	0,1346	24,4			200	–	29	0,0838	21,9	
	355	–	106,5	0,1564	25,8			225	–	41,5	0,0997	23	
	400	–	129	0,1809	27,4			250	–	54	0,1156	23,9	
	450	–	154	0,2082	29,2			280	–	69	0,1346	25,1	
	500	–	179	0,2354	30,9			300	–	79	0,1473	25,9	

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A x B [mm]	Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type	A x B [mm]	Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type
	a [mm]	c [mm]					a [mm]	c [mm]			
650 x	315	—	86,5	0,1568	26,4	750 x	200	—	29	0,0970	23,8
	355	—	106,5	0,1822	28		225	—	41,5	0,1154	25
	400	—	129	0,2108	29,7		250	—	54	0,1338	26
	450	—	154	0,2426	31,7		280	—	69	0,1558	27,3
	500	—	179	0,2743	33,6		300	—	79	0,1705	28,1
	550	—	204	0,3061	35,6		315	—	86,5	0,1815	28,8
	560	—	209	0,3124	36		355	—	106,5	0,2109	30,5
	600	—	229	0,3378	37,5		400	—	129	0,2440	32,4
	630	—	244	0,3569	38,7		450	—	154	0,2808	34,5
	650	9	254	0,3696	39,5		500	—	179	0,3175	36,6
	700	34	279	0,4013	42,4		550	—	204	0,3543	38,7
	710	39	284	0,4077	42,8		560	—	209	0,3616	39,2
	750	59	304	0,4331	44,4		600	—	229	0,3910	40,9
	800	84	329	0,4648	46,3		630	—	244	0,4131	42,1
700 x	180	—	19	0,0767	22	800 x	650	9	254	0,4278	44
	200	—	29	0,0904	22,9		700	34	279	0,4645	46,1
	225	—	41,5	0,1075	24		710	39	284	0,4719	46,6
	250	—	54	0,1247	25		750	59	304	0,5013	48,3
	280	—	69	0,1452	26,2		800	84	329	0,5380	50,4
	300	—	79	0,1589	27		180	—	19	0,0879	23,8
	315	—	86,5	0,1692	27,6		200	—	29	0,1036	24,8
	355	—	106,5	0,1966	29,2		225	—	41,5	0,1232	26
	400	—	129	0,2274	31,1		250	—	54	0,1429	27,1
	450	—	154	0,2617	33,1		280	—	69	0,1664	28,4
	500	—	179	0,2959	35,1		300	—	79	0,1821	29,3
	550	—	204	0,3302	37,2		315	—	86,5	0,1939	29,9
	560	—	209	0,3370	37,6		355	—	106,5	0,2253	31,7
	600	—	229	0,3644	39,2		400	—	129	0,2606	33,7
710 x	630	—	244	0,3850	40,4		450	—	154	0,2999	35,9
	650	9	254	0,3987	42,2		500	—	179	0,3391	38,1
	700	34	279	0,4329	44,3		550	—	204	0,3784	40,3
	710	39	284	0,4398	44,7		560	—	209	0,3862	40,8
	750	59	304	0,4672	46,3		600	—	229	0,4176	42,5
	800	84	329	0,5014	48,3		630	—	244	0,4412	44,9
	180	—	19	0,0778	22,2		650	9	254	0,4569	45,8
	200	—	29	0,0917	23,1		700	34	279	0,4961	48
	225	—	42	0,1091	24,2		710	39	284	0,5040	48,4
	250	—	54	0,1265	25,2		750	59	304	0,5354	50,2
	280	—	69	0,1473	26,4		800	84	329	0,5746	52,4
	300	—	79	0,1612	27,2		180	—	19	0,0991	25,6
	315	—	86,5	0,1717	27,8		200	—	29	0,1168	26,7
	355	—	106,5	0,1995	29,5		225	—	41,5	0,1389	28
750 x	400	—	129	0,2307	31,3		250	—	54	0,1611	29,2
	450	—	154	0,2655	33,4		280	—	69	0,1876	30,6
	500	—	179	0,3002	35,4		300	—	79	0,2053	31,5
	550	—	204	0,3350	37,5		315	—	86,5	0,2186	32,3
	560	—	209	0,3419	37,9		355	—	106,5	0,2540	34,2
	600	—	229	0,3697	39,5		400	—	129	0,2938	36,3
	630	—	244	0,3906	40,8		450	—	154	0,3381	38,7
	650	9	254	0,4045	42,6		500	—	179	0,3823	41,1
	700	34	279	0,4392	44,7		550	—	204	0,4266	43,5
	710	39	284	0,4462	45,1		560	—	209	0,4354	45
	750	59	304	0,4740	46,7		600	—	229	0,4708	46,9
	800	84	329	0,5087	48,8		630	—	244	0,4974	48,4
	750 x 180	—	19	0,0823	22,9		650	9	254	0,5151	49,3

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A x B [mm]		Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type	A x B [mm]		Damper blade overlaps		Effective area Sef [m²]	Weight [kg]	Actuating mechanism type
		a [mm]	c [mm]						a [mm]	c [mm]			
900 x	700	34	279	0,5593	51,7	BELIMO BE (40 N.m)	1250 x	400	–	129	0,4100	45,7	BELIMO BEN (15 N.m)
	710	39	284	0,5682	52,2			450	–	154	0,4718	48,8	
	750	59	304	0,6036	54,1			500	–	179	0,5335	52,9	BELIMO BEE (25 N.m)
	800	84	329	0,6478	56,5			550	–	204	0,5953	55,9	
1000 x	180	–	19	0,1103	27,4	BELIMO BEN (15 N.m)		560	–	209	0,6076	56,5	BELIMO BE (40 N.m)
	200	–	29	0,1300	28,6			600	–	229	0,6570	59	
	225	–	41,5	0,1546	30			630	–	244	0,6941	60,8	
	250	–	54	0,1793	31,3			650	9	254	0,7188	62,1	
	280	–	69	0,2088	32,9			700	34	279	0,7805	65,1	
	300	–	79	0,2285	33,9			710	39	284	0,7929	65,8	
	315	–	86,5	0,2433	34,7			750	59	304	0,8423	68,2	
	355	–	106,5	0,2827	36,8			800	84	329	0,9040	71,3	
	400	–	129	0,3270	39,1		BELIMO BEE (25 N.m)	180	–	19	0,1551	34,7	
	450	–	154	0,3763	41,7			200	–	29	0,1828	36,2	
	500	–	179	0,4255	44,4			225	–	41,5	0,2174	38	
	550	–	204	0,4748	47			250	–	54	0,2521	39,7	
	560	–	209	0,4846	48,5	280		–	69	0,2936	41,7		
	600	–	229	0,5240	50,6	300		–	79	0,3213	43		
	630	–	244	0,5536	52,2	315		–	86,5	0,3421	44		
	650	9	254	0,5733	53,2	355		–	106,5	0,3975	46,7		
	1100 x	700	34	279	0,6225	55,9	BELIMO BE (40 N.m)	400	–	129	0,4598	49,7	BELIMO BEE (25 N.m)
		710	39	284	0,6324	56,4		450	–	154	0,5291	54	
		750	59	304	0,6718	58,5		500	–	179	0,5983	57,4	
		800	84	329	0,7210	61,1		550	–	204	0,6676	60,7	
180		–	19	0,1215	29,2	BELIMO BEN (15 N.m)	560	–	209	0,6814	61,4	BELIMO BE (40 N.m)	
200		–	29	0,1432	30,5		600	–	229	0,7368	64		
225		–	41,5	0,1703	32		630	–	244	0,7784	66		
250		–	54	0,1975	33,4		650	9	254	0,8061	67,4		
280	–	69	0,2300	35,1	700		34	279	0,8753	70,7			
300	–	79	0,2517	36,2	710		39	284	0,8892	71,4			
315	–	86,5	0,2680	37	750		59	304	0,9446	74			
355	–	106,5	0,3114	39,2	800		84	329	1,0138	84,2			
400	–	129	0,3602	41,8	SCHISCHEK InMax 50.75		180	–	19	0,1663	36,5		
450	–	154	0,4145	44,6			200	–	29	0,1960	38,1		
500	–	179	0,4687	48,4			225	–	41,5	0,2331	40		
550	–	204	0,5230	51,2			250	–	54	0,2703	41,7		
560	–	209	0,5338	51,7		280	–	69	0,3148	43,9			
600	–	229	0,5772	54		300	–	79	0,3445	45,3			
630	–	244	0,6098	55,7		315	–	86,5	0,3668	46,3			
650	9	254	0,6315	56,8		355	–	106,5	0,4262	49,1			
1250 x	700	34	279	0,6857	59,6	BELIMO BE (40 N.m)	400	–	129	0,4930	52,3	BELIMO BEE (25 N.m)	
	710	39	284	0,6966	60,1		450	–	154	0,5673	56,8		
	750	59	304	0,7400	62,4		500	–	179	0,6415	60,3		
	800	84	329	0,7942	65,2		550	–	204	0,7158	63,9		
	180	–	19	0,1383	31,9	BELIMO BEN (15 N.m)	560	–	209	0,7306	64,6	BELIMO BE (40 N.m)	
	200	–	29	0,1630	33,3		600	–	229	0,7900	67,4		
	225	–	41,5	0,1939	35		630	–	244	0,8346	69,5		
	250	–	54	0,2248	36,5		650	9	254	0,8643	70,9		
280	–	69	0,2618	38,4	700		34	279	0,9385	74,4			
300	–	79	0,2865	39,6	710		39	284	0,9534	75,1			
315	–	86,5	0,3050	40,5	750		59	304	1,0128	77,9			
355	–	106,5	0,3544	43	800		84	329	1,0870	88,3			

Sizes listed within the maximum/minimum sizes can be manufactured on request.

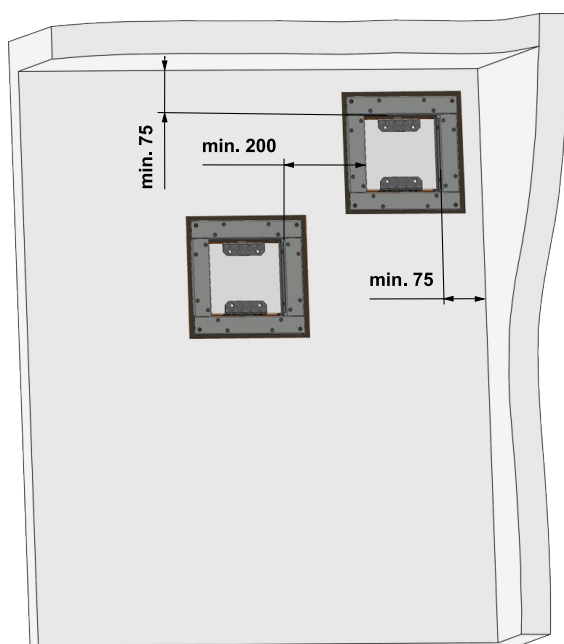
IV. INSTALLATION

Placement and installation

- Smoke dampers are intended for use in spaces with multiple fire compartments, which can be connected by a smoke extraction duct tested according to BS EN 1366-8 or BS EN 1366-9 or can be installed in the construction of the fire compartment.
- Dampers can be installed with the actuator on the top, bottom or either side.
- If Actuator is installed on the bottom take care when removing the actuator housing cover.
- 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.

The distance between the smoke damper and the construction

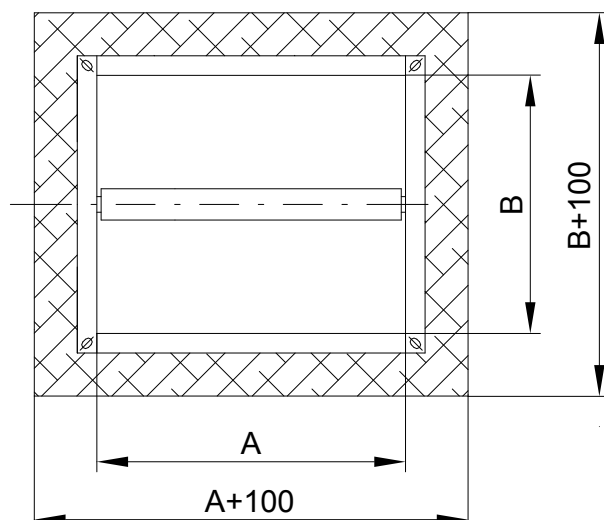
- minimum distance 200 mm between dampers installed in the duct;
- minimum distance 75 mm between damper and construction (wall/ceiling).



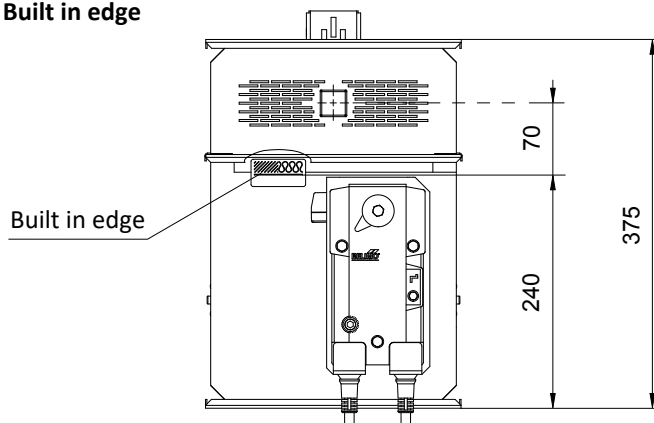
- This is the BS EN 1366-10 test standard distances. They are considered as minimum. Actual location should be based on wall manufacturers requirements.
- Always consult the wall manufacturers specific guidelines for deflection heads, penetration size, location to other services, fire stopping and load bearing capacity.
- With smoke control ducting then refer to duct manufacturers tested parameters for spacing & pattern requirements.
- No other services should pass through the dampers building work opening.
- For lightweight walls always consult the wall manufacturer specific guidelines for penetrations sizes and distances.

- During installation the damper blade must be in position "CLOSED". The damper body should not be deformed in the course of installation.
- Once the damper is built in, its blade should move freely and not rub against the body of the damper or duct during operation.

Dimensions of installation opening



Built in edge



"Wall edge sticker" indicates the recommended edge of installation of smoke control 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.

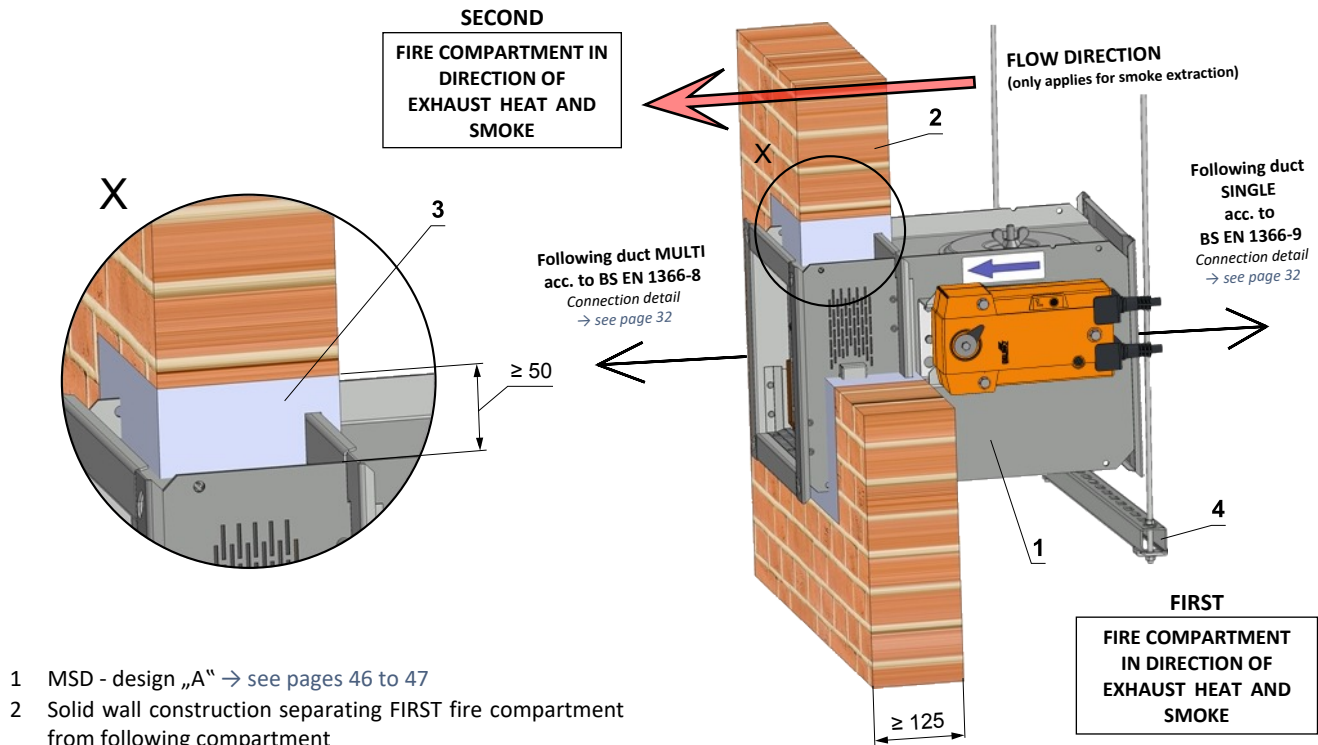
Statement of installations

Placement	wall/ceiling min. thickness [mm]	Filling of space between damper and wall	Fire resistance	Page
In solid wall construction SINGLE / MULTI	125	Mortar or gypsum	EI 120 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	19
	100	Ablative Coated Batt	EI 90 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	19
	125	Insulation with ROCKWOOL FIREPRO Mortar or gypsum	EI 120 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	20
	100	Insulation with ROCKWOOL FIREPRO Ablative Coated Batt	EI 90 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	21
In gypsum wall construction SINGLE / MULTI	125	Mortar or gypsum	EI 120 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	22
	100	Ablative Coated Batt	EI 90 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	22
	125	Insulation with ROCKWOOL FIREPRO Mortar or gypsum	EI 120 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	23
	100	Insulation with ROCKWOOL FIREPRO Ablative Coated Batt	EI 90 (v _{ew} i↔o) S1500C _{mod} HOT400/30AAmulti	24
In solid ceiling construction SINGLE / MULTI	150	Mortar or gypsum	EI 120 (h _{ow} i↔o) S1500C _{mod} HOT400/30AAmulti	25
		Ablative Coated Batt	EI 90 (h _{ow} i↔o) S1500C _{mod} HOT400/30AAmulti	25
In solid ceiling construction MULTI / MULTI		Insulation with stone wool Mortar or gypsum	EI 120 (h _{ow} i↔o) S1500C _{mod} HOT400/30AAmulti	26
		Insulation with stone wool Ablative Coated Batt	EI 90 (h _{ow} i↔o) S1500C _{mod} HOT400/30AAmulti	26
Vertical duct installation MULTI / MULTI	—	Insulation with ROCKWOOL FIREPRO	EI 120 (v _{ed} -h _{od} i↔o) S1500C _{mod} HOT400/30AAmulti	27
Horizontal duct installation MULTI / MULTI	—			28

Installation in solid wall construction SINGLE / MULTI

Dividing construction between SINGLE / MULTI duct - mortar or gypsum

EIS 120

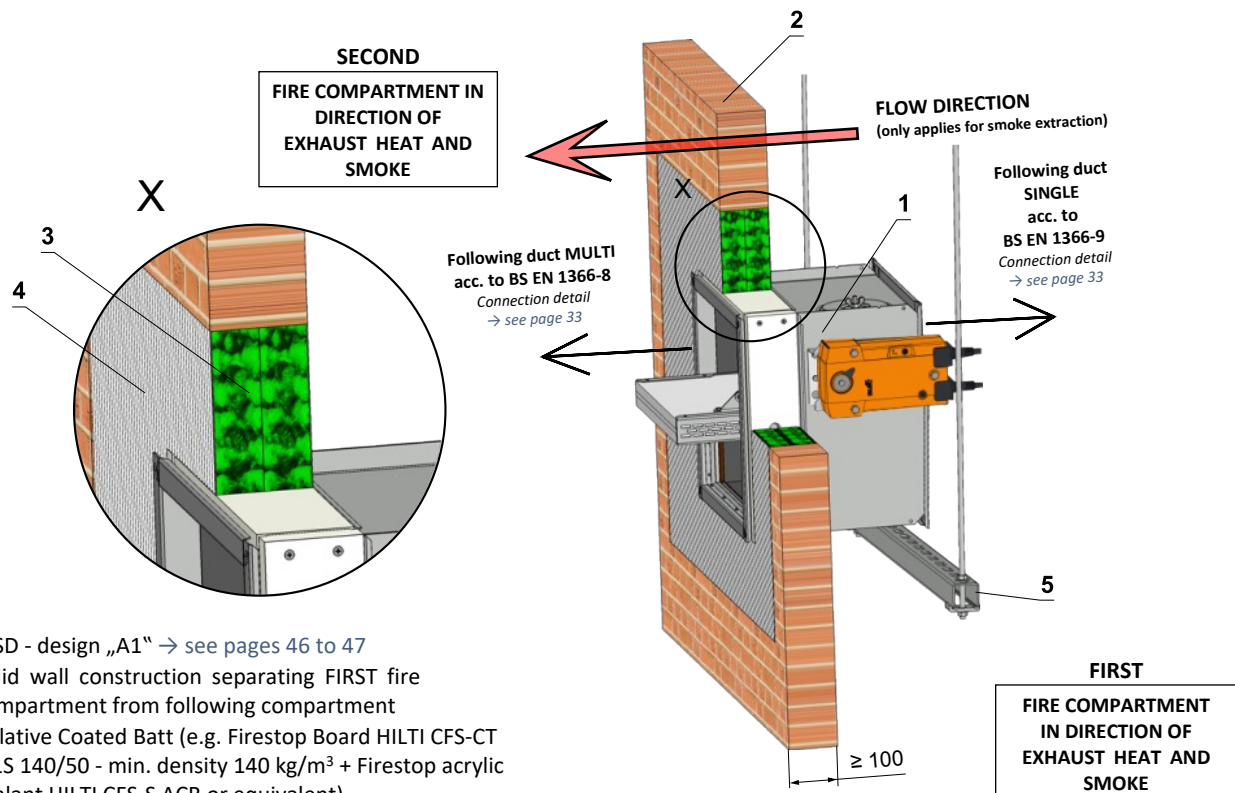


- 1 MSD - design „A“ → see pages 46 to 47
- 2 Solid wall construction separating FIRST fire compartment from following compartment
- 3 British gypsum thistle bond 60 (or equivalent can by used) minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 27 to 30*

* This installation was tested without supports. Supports can be used on wall manufacturers guidance, or after national standards.

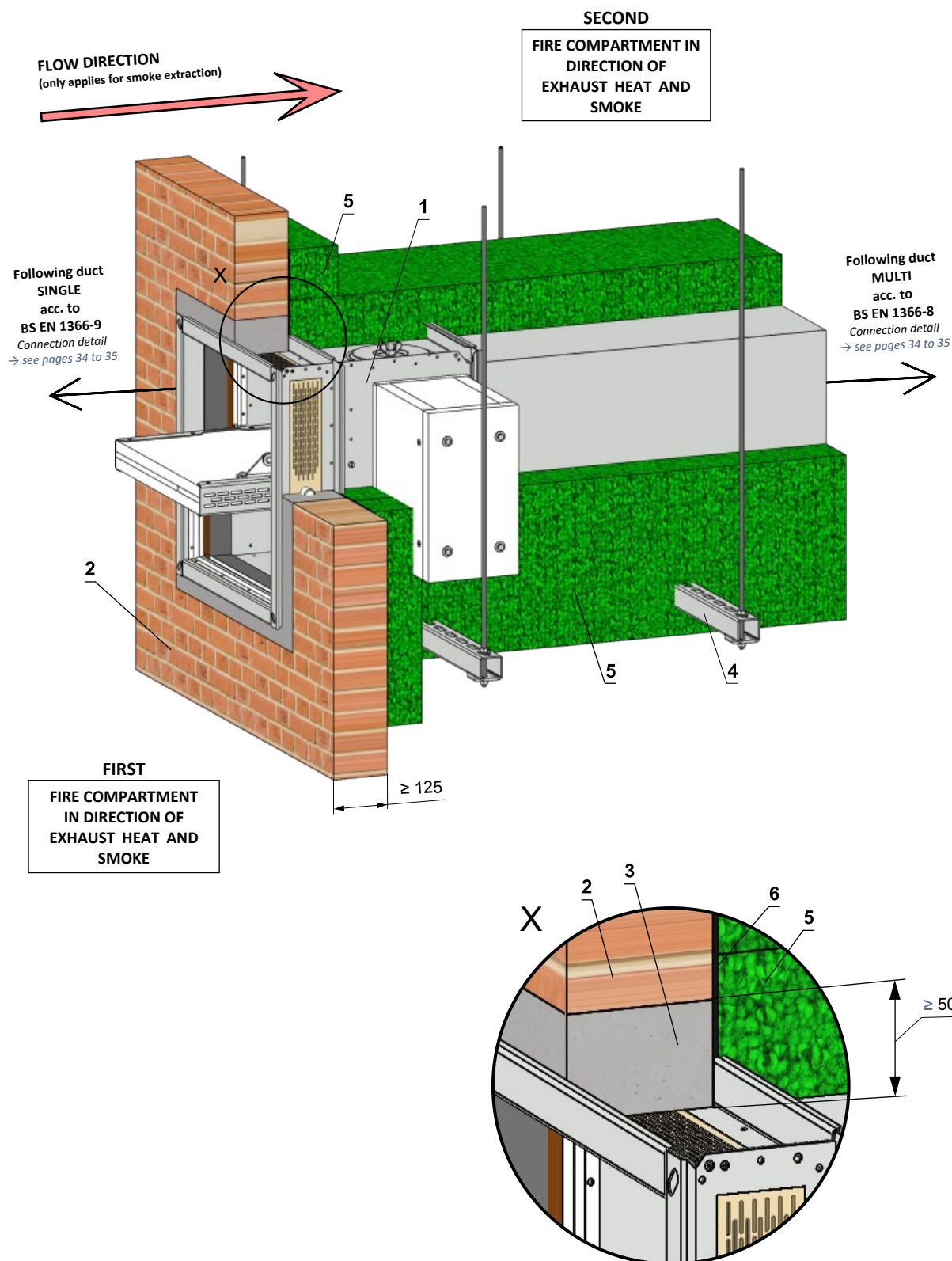
Dividing construction between SINGLE / MULTI duct - Ablative Coated Batt

EIS 90



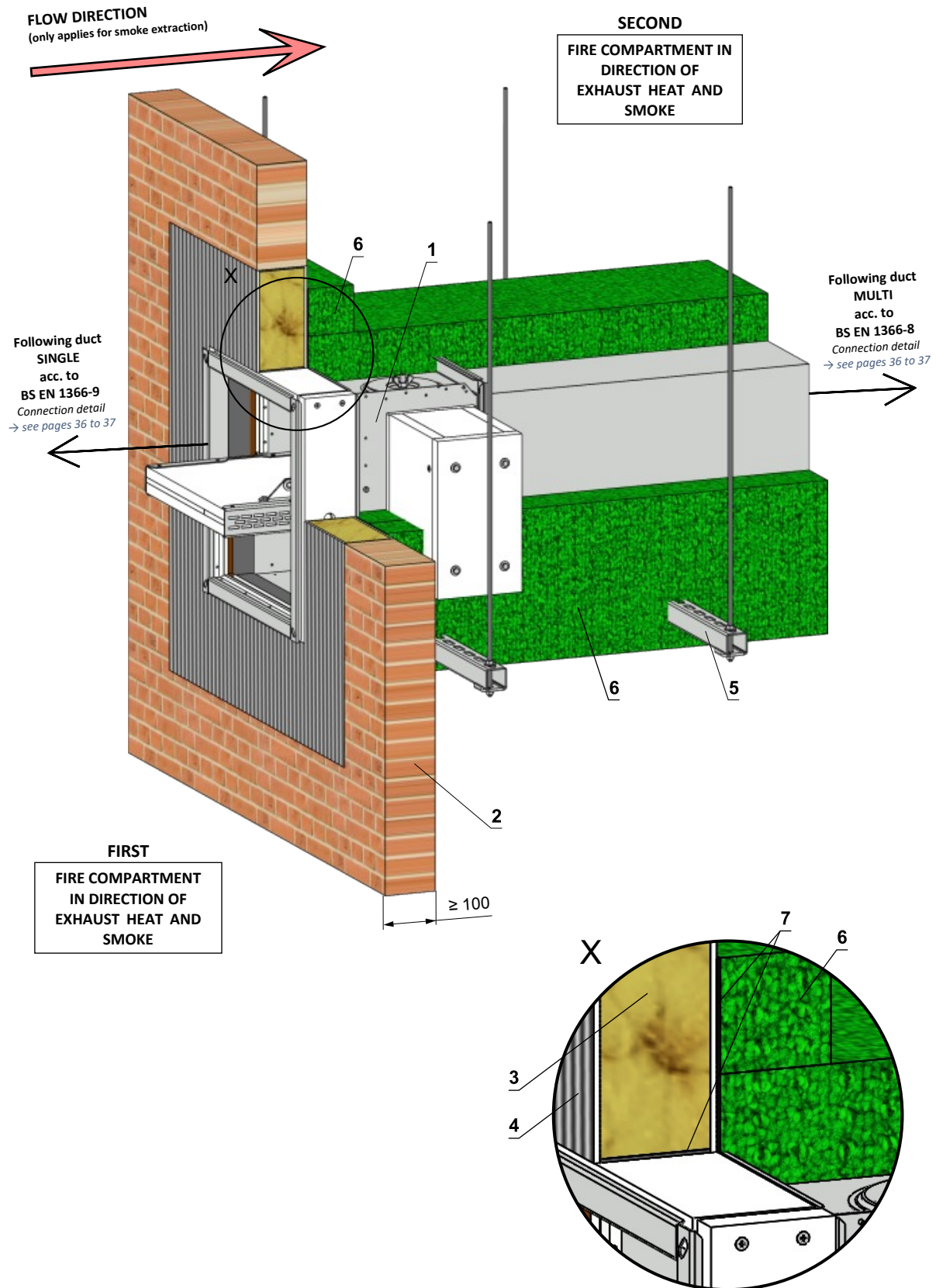
- 1 MSD - design „A1“ → see pages 46 to 47
- 2 Solid wall construction separating FIRST fire compartment from following compartment
- 3 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 4 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 5 Fixing profile with threaded rod → see pages 27 to 30

Dividing construction between SINGLE / MULTI duct - insulation with ROCKWOOL FIREPRO - mortar or gypsum EIS 120



- 1 MSD - design „IB“ → see pages 46 to 47
- 2 Solid wall construction separating FIRST fire compartment from following compartment
- 3 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³)
- 4 Fixing profile with threaded rod → see pages 27 to 30
- 5 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 6 ROCKWOOL FIREPRO Glue

Dividing construction between SINGLE / MULTI duct - insulation with ROCKWOOL FIREPRO - Ablative Coated Batt EIS 90

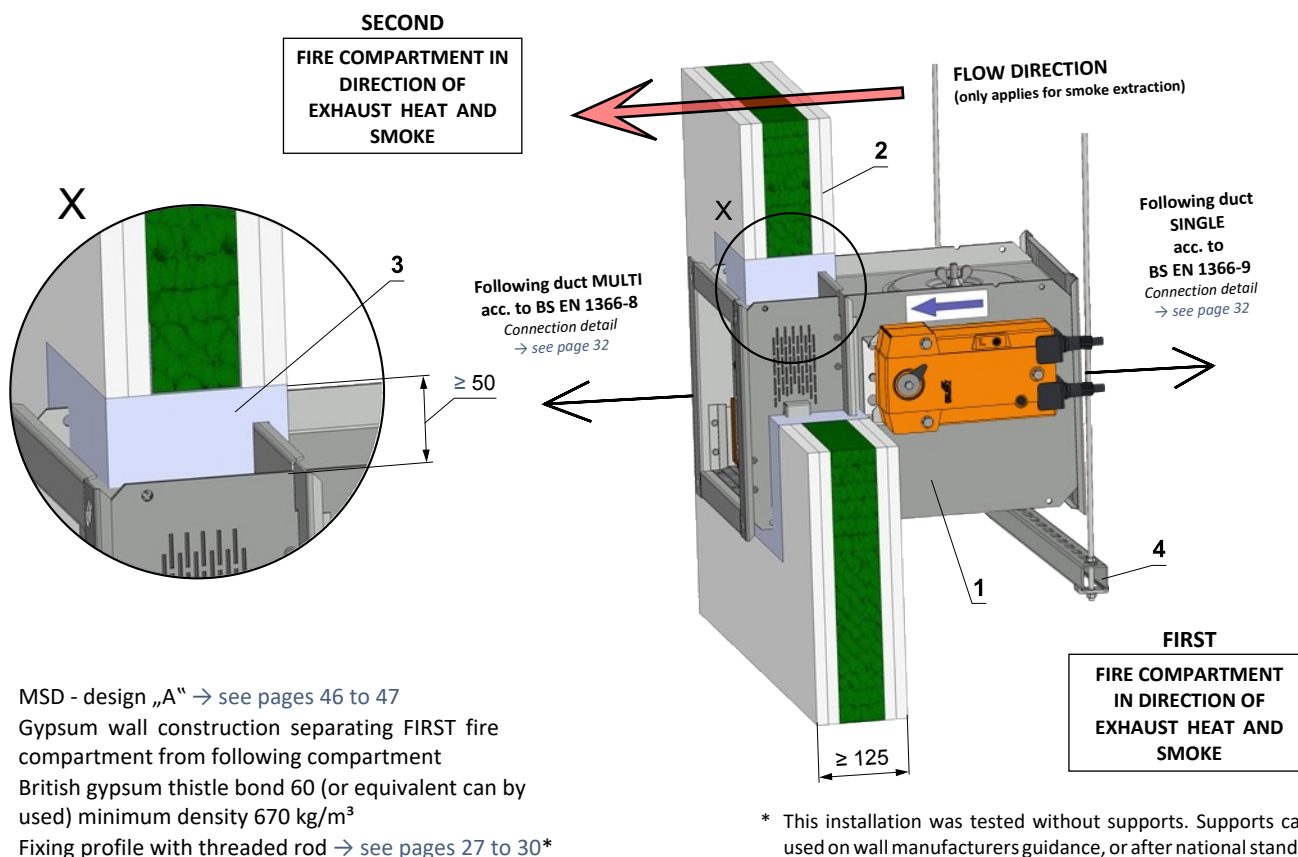


- 1 MSD - design „IB1“ → see pages 46 to 47
- 2 Solid wall construction separating FIRST fire compartment from following compartment
- 3 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 4 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 5 Fixing profile with threaded rod → see pages 27 to 30
- 6 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 7 ROCKWOOL FIREPRO Glue

Installation in gypsum wall SINGLE / MULTI

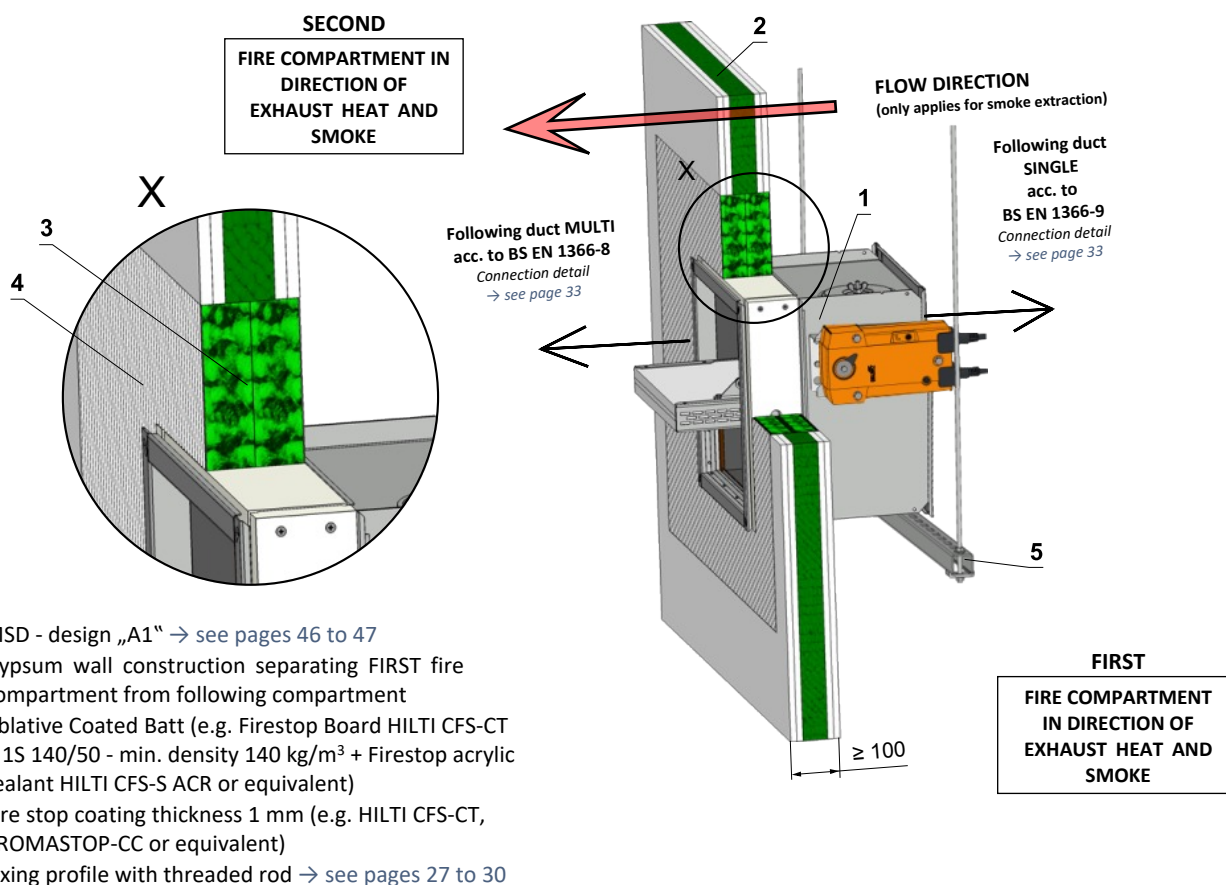
Dividing construction between SINGLE / MULTI duct - mortar or gypsum

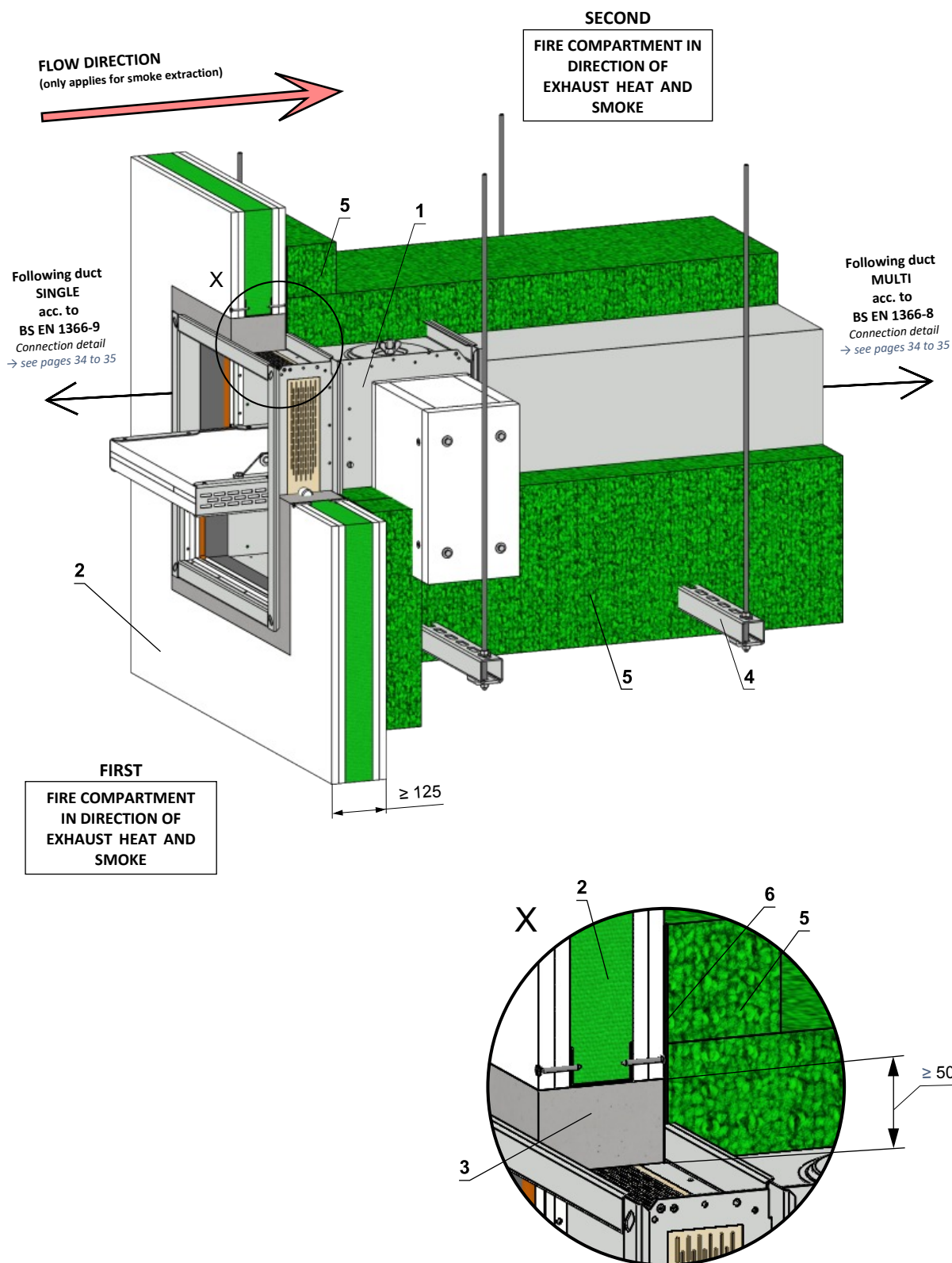
EIS 120



Dividing construction between SINGLE / MULTI duct - Ablative Coated Batt

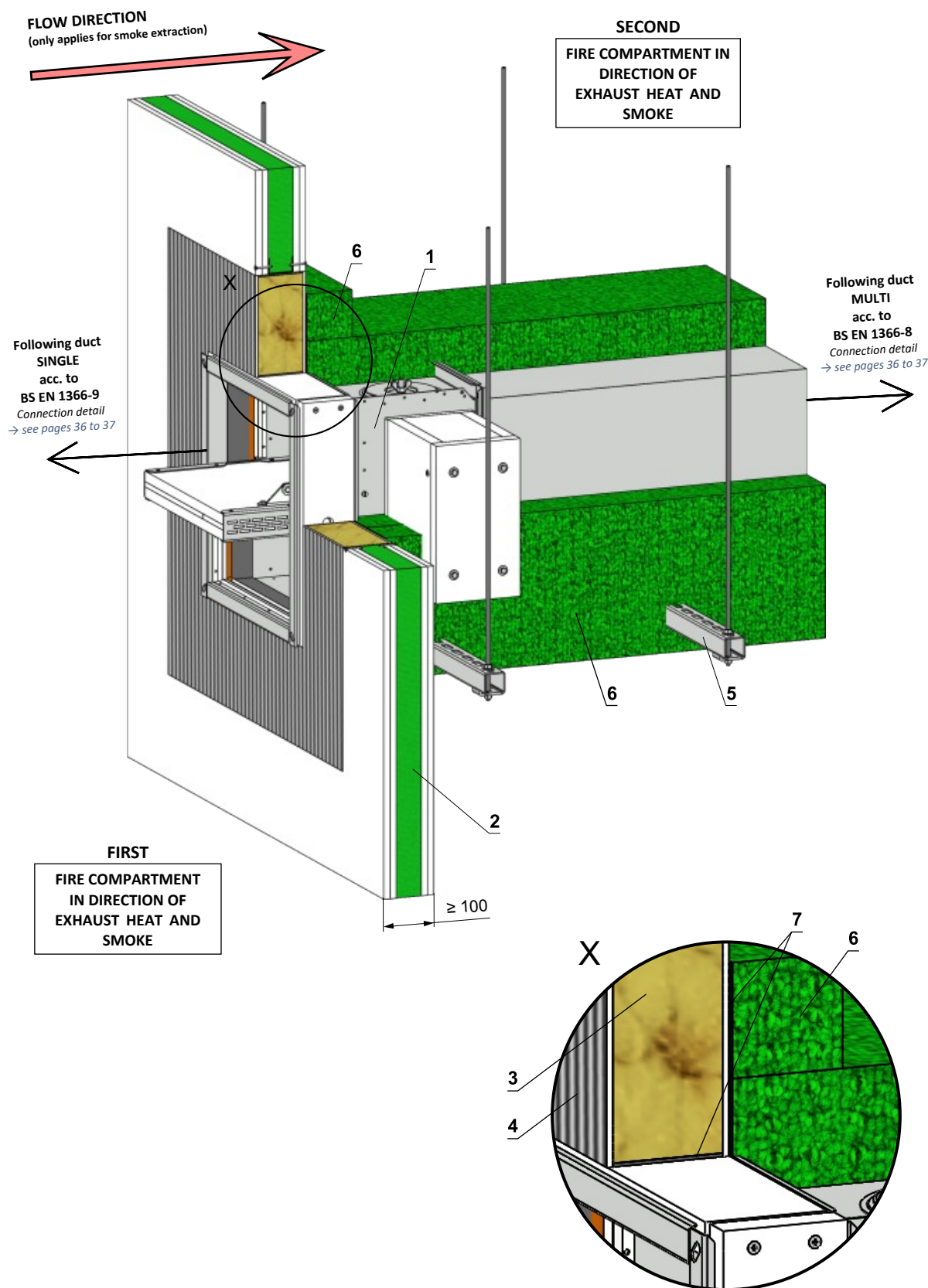
EIS 90





- 1 MSD - design „IB“ → see pages 46 to 47
- 2 Gypsum wall construction separating FIRST fire compartment from following compartment
- 3 British gypsum thistle bond 60 (or equivalent can by used) minimum density 670 kg/m³)
- 4 Fixing profile with threaded rod → see pages 27 to 30
- 5 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 6 ROCKWOOL FIREPRO Glue

Dividing construction between SINGLE / MULTI duct - insulation with ROCKWOOL FIREPRO - Ablative Coated Batt EIS 90

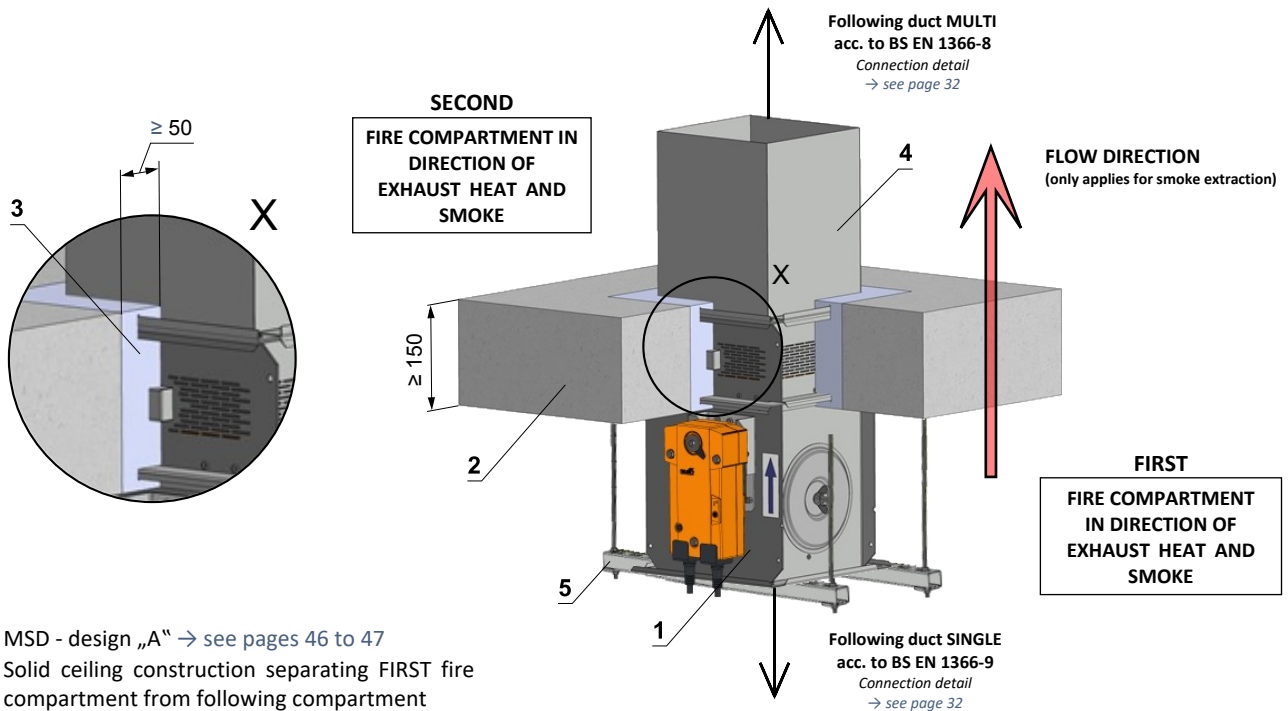


- 1 MSD - design „IB1“ → see pages 46 to 47
- 2 Gypsum wall construction separating FIRST fire compartment from following compartment
- 3 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 4 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 5 Fixing profile with threaded rod → see pages 27 to 30
- 6 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 7 ROCKWOOL FIREPRO Glue

Installation in solid ceiling construction SINGLE / MULTI

Dividing construction between SINGLE / MULTI duct - mortar or gypsum

EIS 120

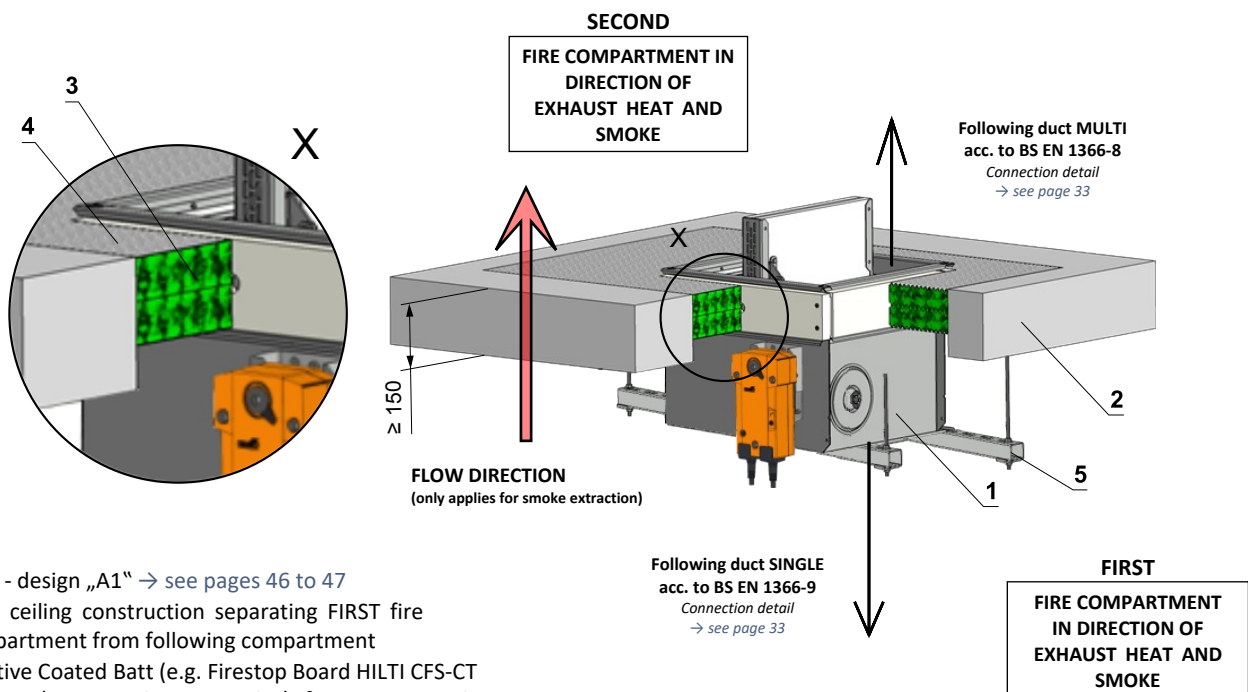


- 1 MSD - design „A“ → see pages 46 to 47
- 2 Solid ceiling construction separating FIRST fire compartment from following compartment
- 3 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- 4 Duct
- 5 Fixing profile with threaded rod → see pages 27 to 30*

* This installation was tested without supports. Supports can be used on wall manufacturers guidance, or after national standards.

Dividing construction between SINGLE / MULTI duct - Ablative Coated Batt

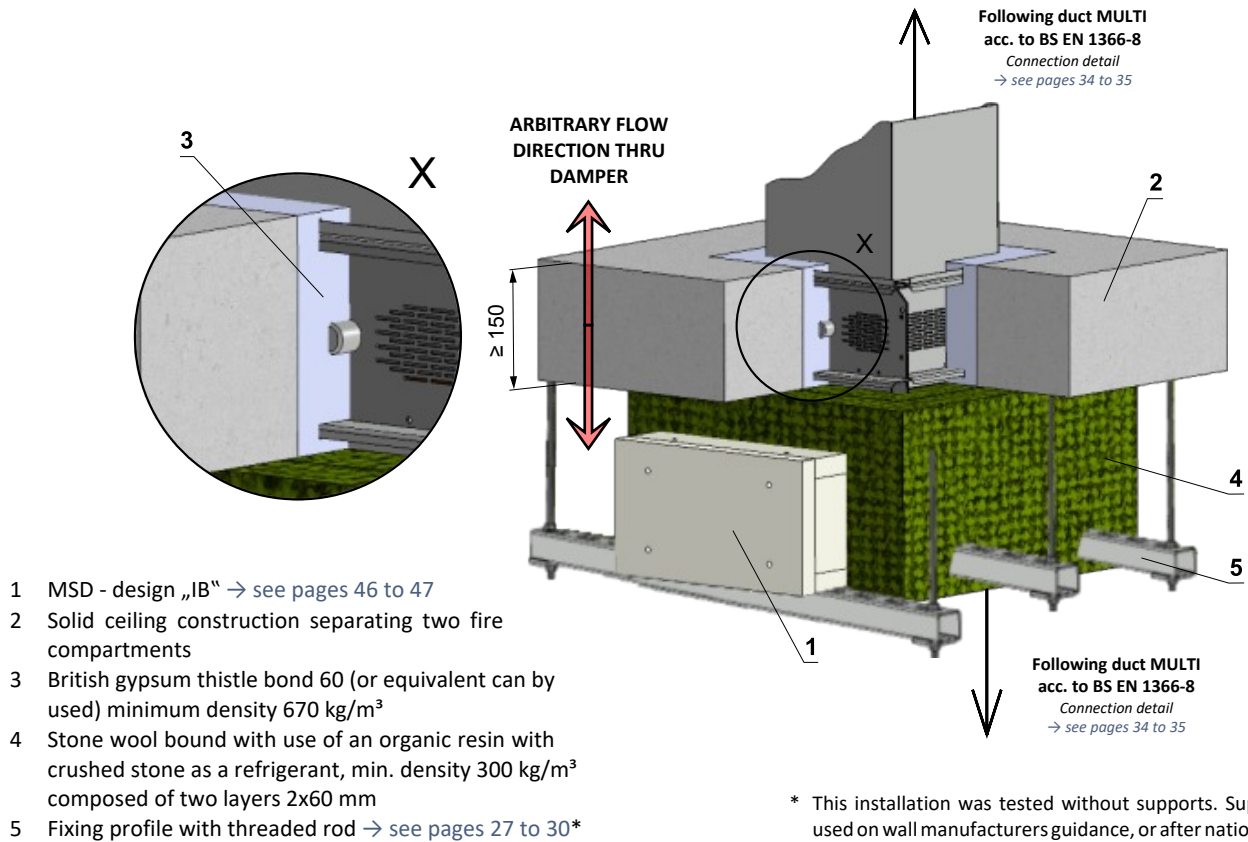
EIS 90



- 1 MSD - design „A1“ → see pages 46 to 47
- 2 Solid ceiling construction separating FIRST fire compartment from following compartment
- 3 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 4 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 5 Fixing profile with threaded rod → see pages 27 to 30

Installation in solid ceiling construction MULTI / MULTI

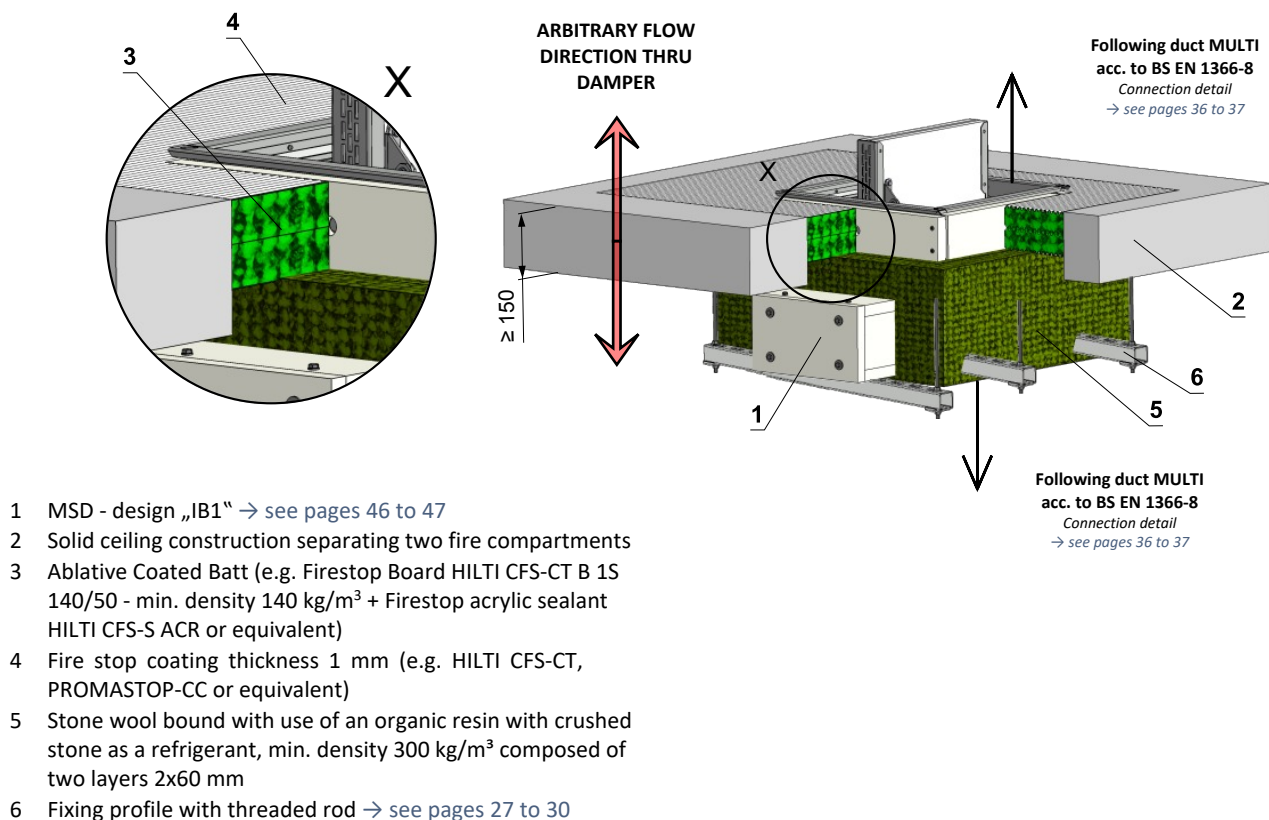
Dividing construction between MULTI / MULTI duct - insulation with stone wool - mortar or gypsum

EIS 120

* This installation was tested without supports. Supports can be used on wall manufacturers guidance, or after national standards.

Dividing construction between MULTI / MULTI duct - insulation with stone wool - Ablative Coated Batt

EIS 90

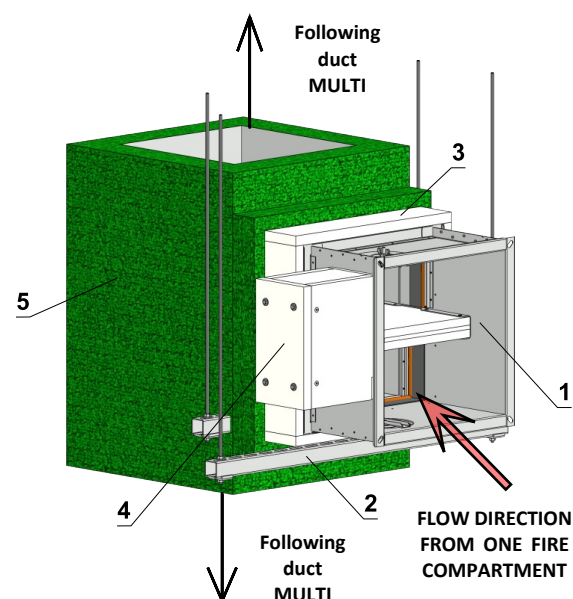
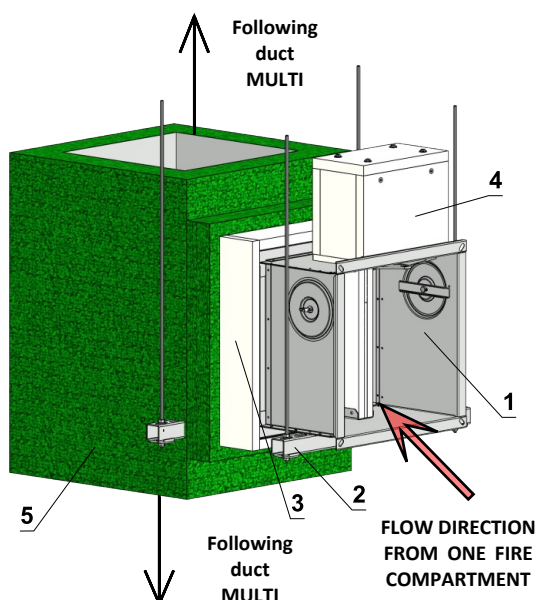
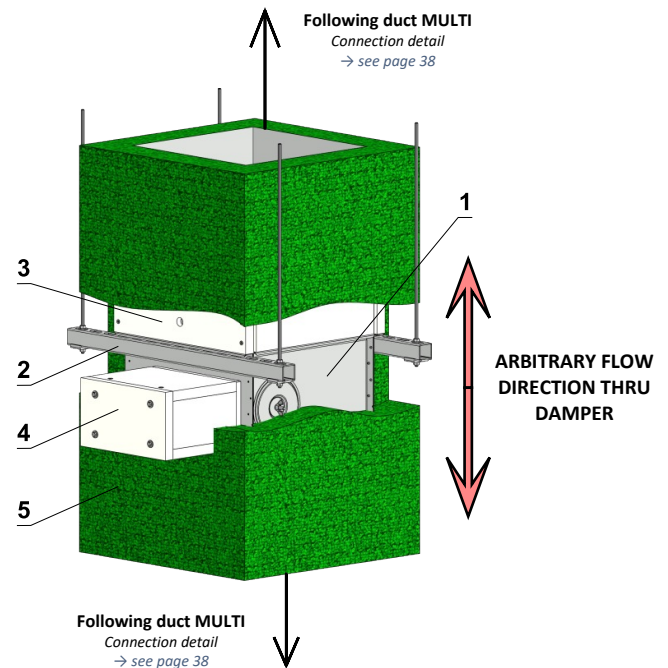
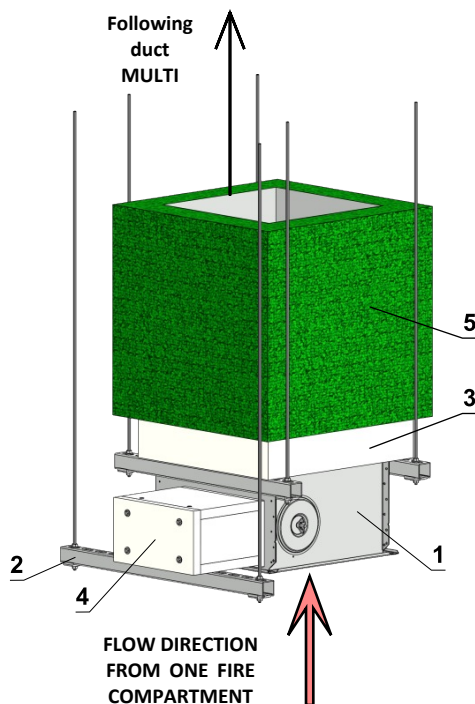


V. SUSPENSION SYSTEMS

Suspension MSD installed in vertical duct MULTI / MULTI

EIS 120

- The dampers and duct must be suspended separately.
- Duct from BS EN 12101-7 in Steel (insulated or spray coated)
- Example of connection to duct → see pages 32 to 38

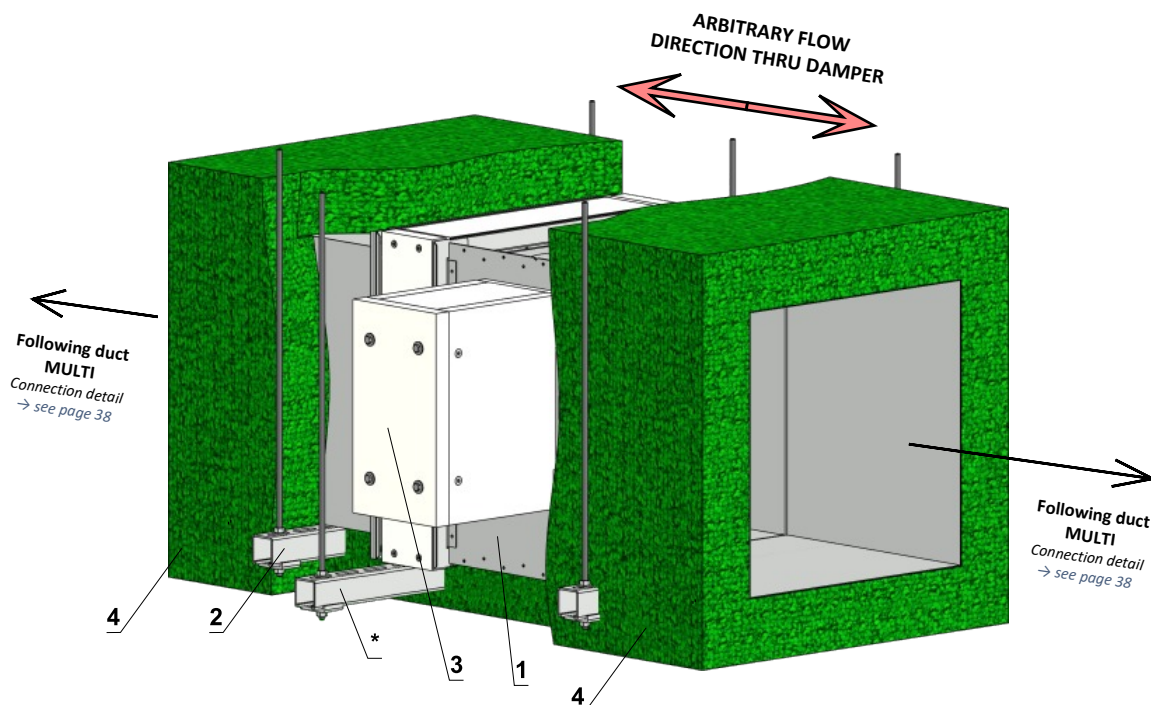


- 1 MSD - design „IB1“
- 2 Fixing profile with threaded rod → see page 30
- 3 Connection's insulation
- 4 Protection box of actuator - part of the IB, IB1 damper design Note: There is no protection box in designs A and A1.
- 5 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8

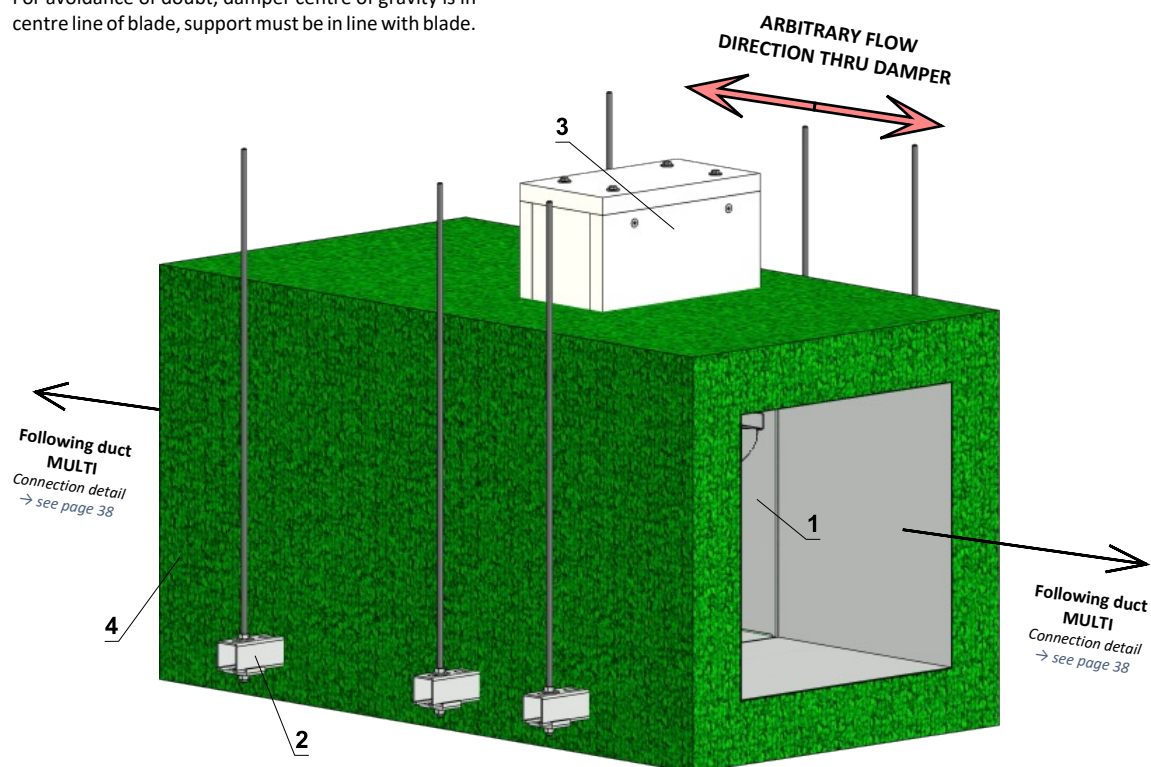
Suspension MSD installed in horizontal duct MULTI / MULTI

EIS 120

- The dampers and duct must be suspended separately.
- Duct from BS EN 12101-7 in Steel (insulated or spray coated)
- Example of connection to duct → see pages 32 to 38



* For avoidance of doubt, damper centre of gravity is in centre line of blade, support must be in line with blade.

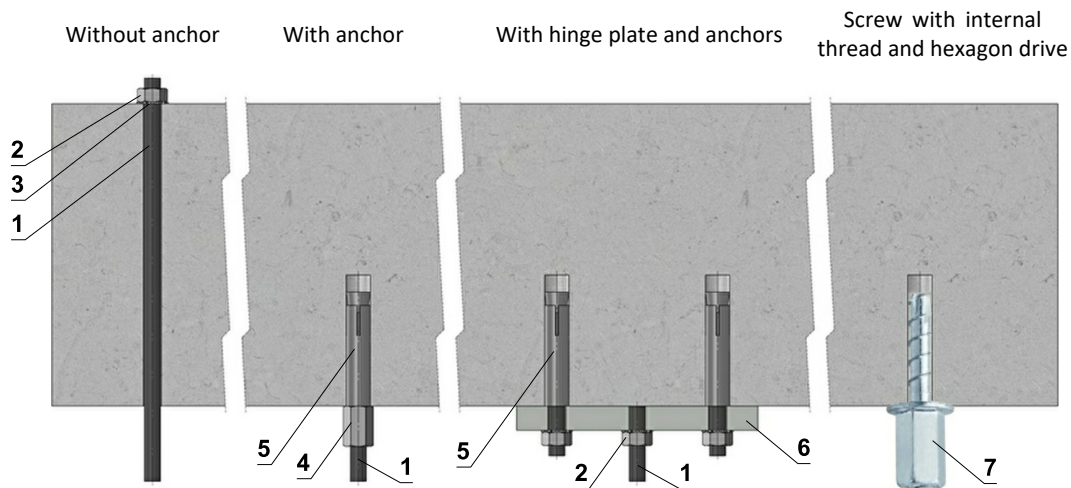


- 1 MSD - design „IB1“
- 2 Fixing profile with threaded rod → see page 30
- 3 Protection box of actuator - part of the IB, IB1 damper design Note: There is no protection box in designs A and A1.
- 4 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8

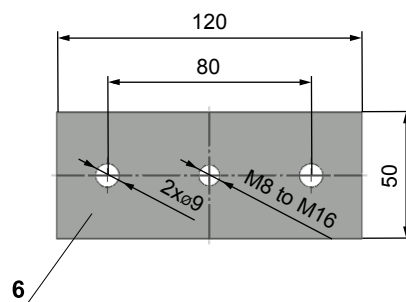
Mounting to the ceiling wall

- The dampers must be suspended using threaded rods and mounting profiles. Their dimensioning depends on the damper's weight.
- The dampers and duct must be suspended separately.
- The connected duct must be suspended in such a way that the transfer of all loads from the adjoining ventilation duct to the damper body is completely excluded. Adjacent duct must be suspended or supported, as required by the duct suppliers.
- Threaded rods longer than 1,5 m must be protected by fire insulation.

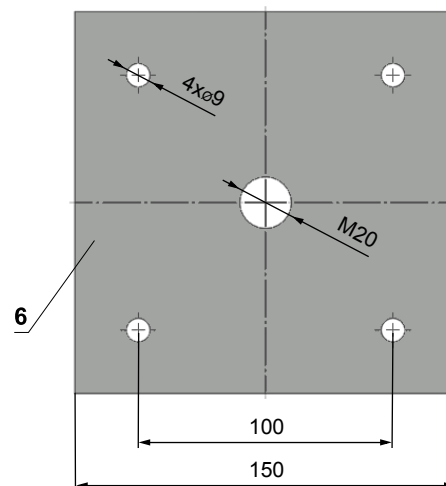
Possible examples of anchoring to the ceiling construction Follow the instructions of fixing specialist or installation company



Hinge plates



- If in doubt then always consult a specialist anchor engineer such as Halfen or Hilti.

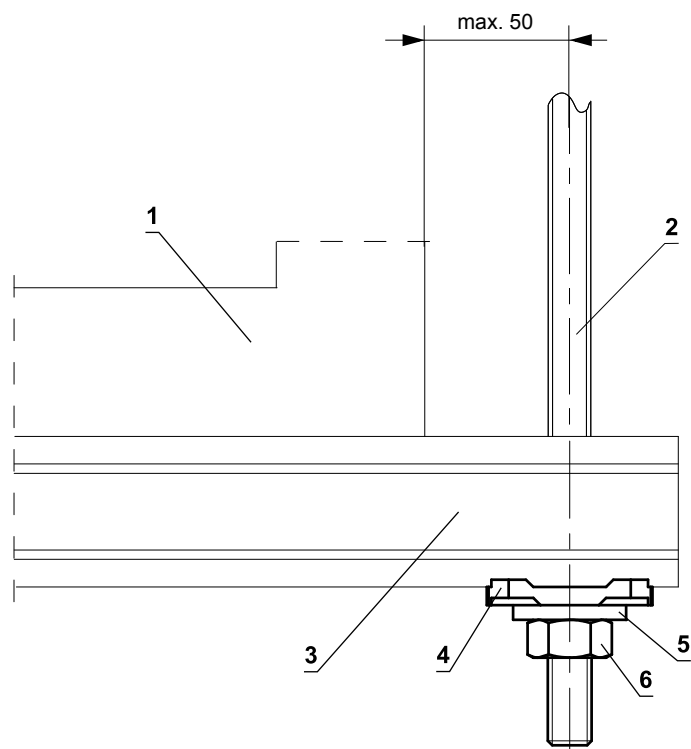
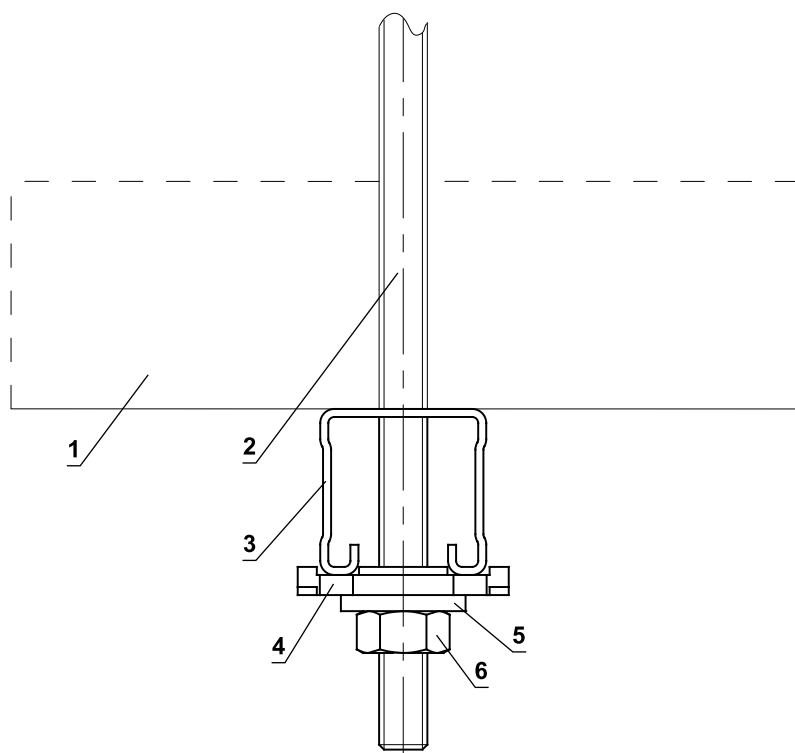


Load capacities of threaded rods at the required fire resistance 60 min. < t ≤ 120 min.

Size	As [mm²]	Weight [kg]	
		for 1 rod	for 2 rods
M8	36,6	22	44
M10	58	35	70
M12	84,3	52	104
M16	157	96	192
M18	192	117	234
M20	245	150	300

- 1 Threaded rod M8 - M20
- 2 Nut M8 - M20
- 3 Washer for M8 - M20
- 4 Coupling Nut M8 - M20
- 5 Anchor
- 6 Hinge plate - min. thickness 10 mm
- 7 Concrete screw tested for fire resistance R30-R90, max. Tension up to 0.75 KN (length 35 mm)

Example of placing of mounting profiles HILTI

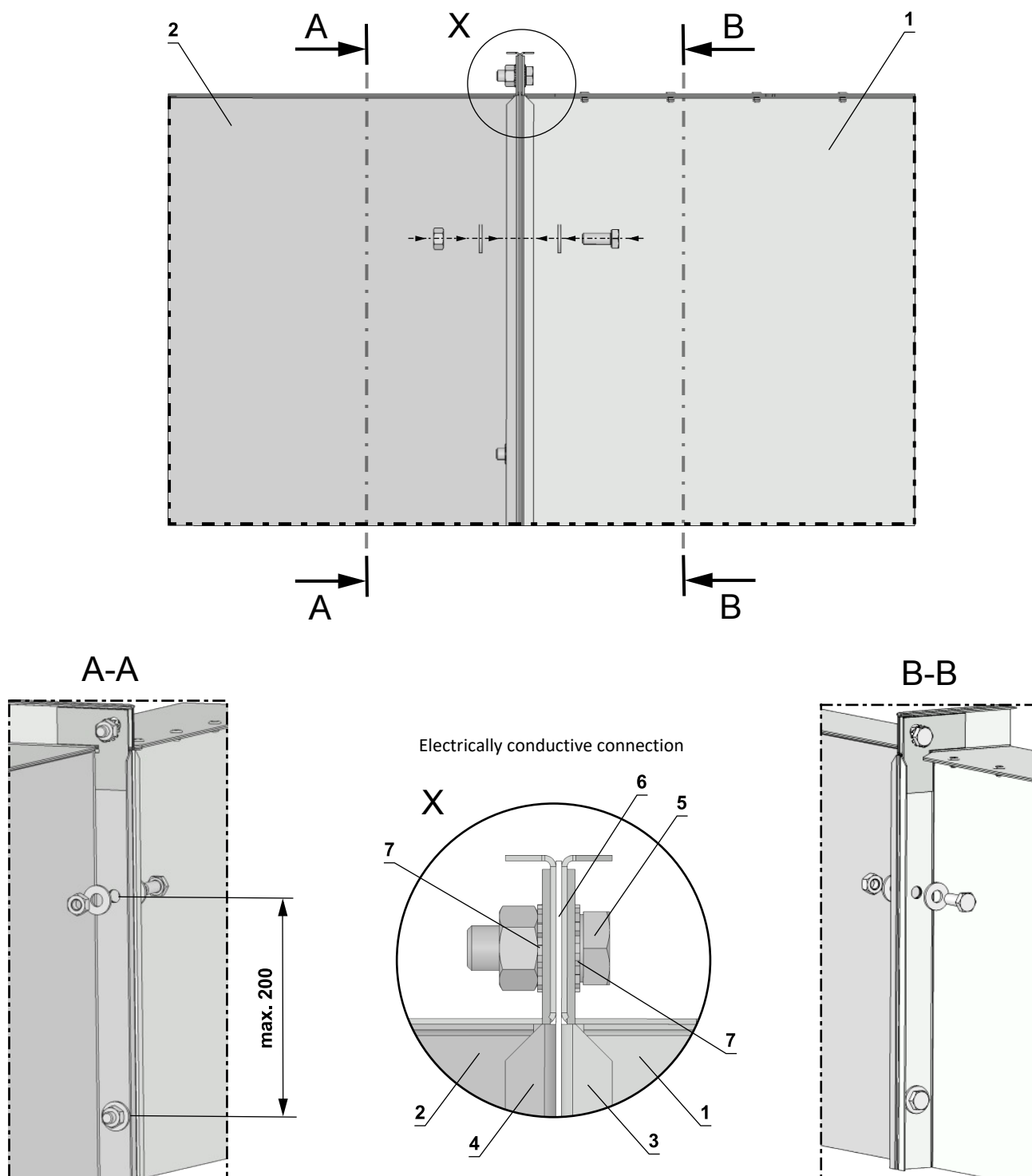


- 1 MSD
- 2 Threaded rod M8 - M12
- 3 Support HILTI MQ-41 or MQ-41/3
- 4 Bored plate HILTI MQZ-L
- 5 Washer for M8 - M12
- 6 Nut M8 - M12

Example of duct connection

Flange connection

Connection to smoke extract duct acc. to BS EN 1366-8 (MULTI) / to BS EN 1366-9 (SINGLE)

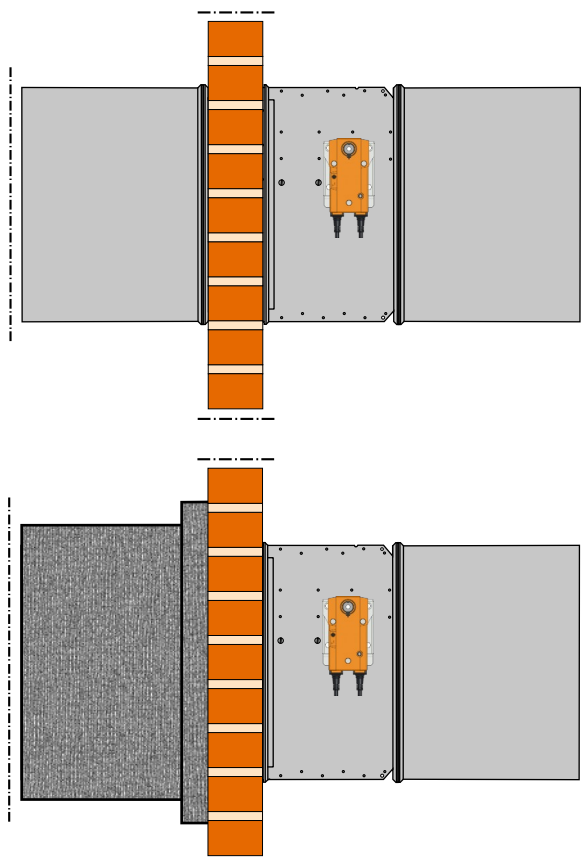
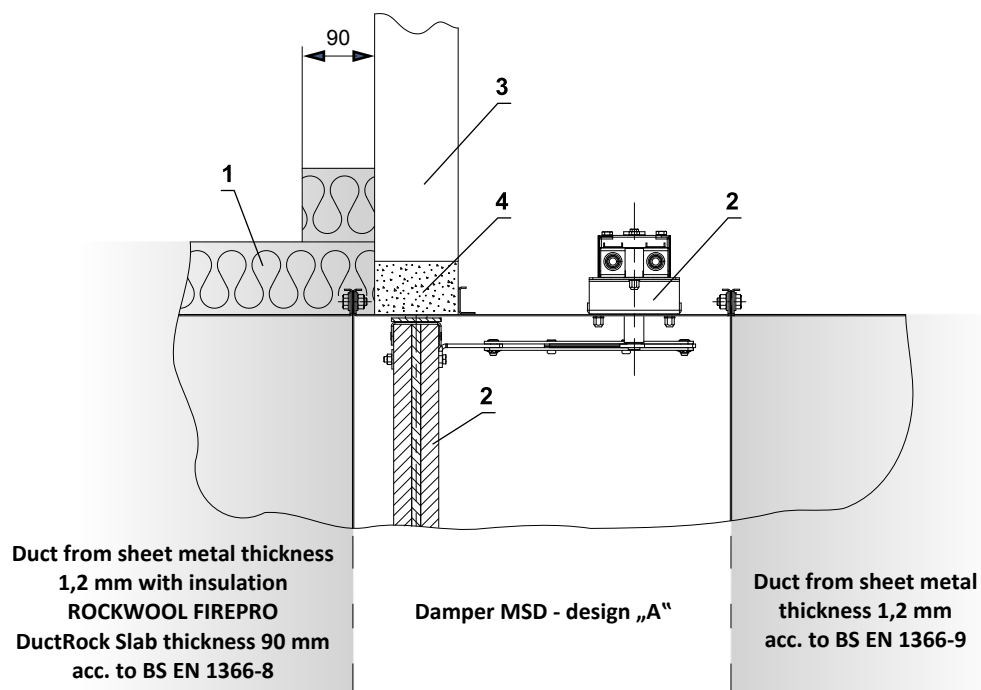


- 1 MSD
- 2 Connecting air duct MULTI
- 3 Flange of MSD
- 4 Flange of duct
- 5 M8 bolt assembly (min. one connection must be electrically conductive)
- 6 Ceramic self-adhesive tape (FJ 120 Pyrosil B 170-250 kg/m³ - Tremco-illbruck) or equivalent
- 7 Lock washers

MSD installed in fire separating construction and connection to steel duct

Connection MSD to steel duct, installed in construction with gypsum filling and insulation - design "A"

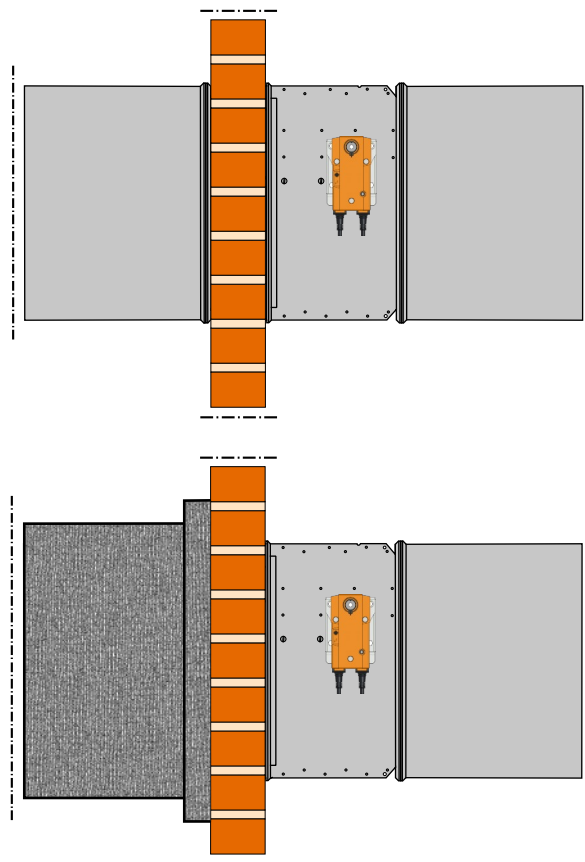
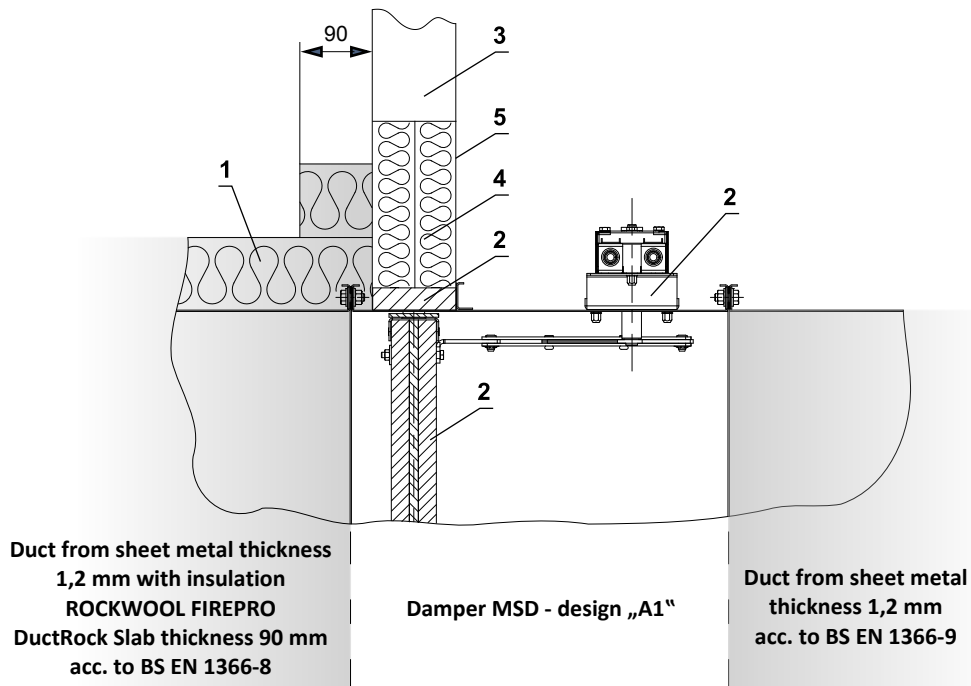
Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.



- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „A“
- 3 Wall
- 4 British gypsum thistle bond 60 (or equivalent can by used) minimum density 670 kg/m³)

Connection MSD to steel duct, installed in construction with Ablative Coat. B. filling and insulation - design "A1"

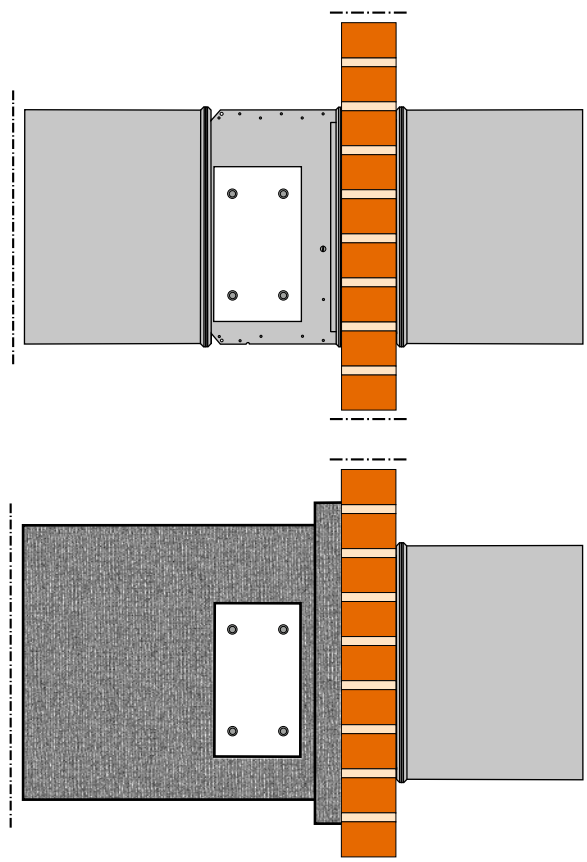
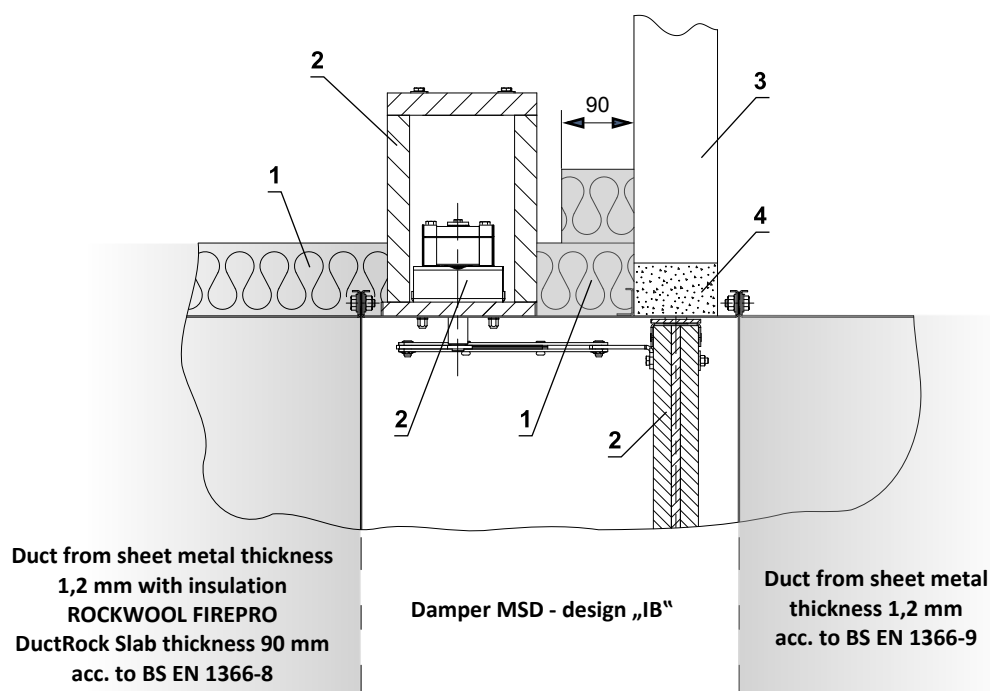
Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.



- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „A1“
- 3 Wall
- 4 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 5 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)

Connection MSD to steel duct, installed in construction with gypsum filling and insulation - design "IB"

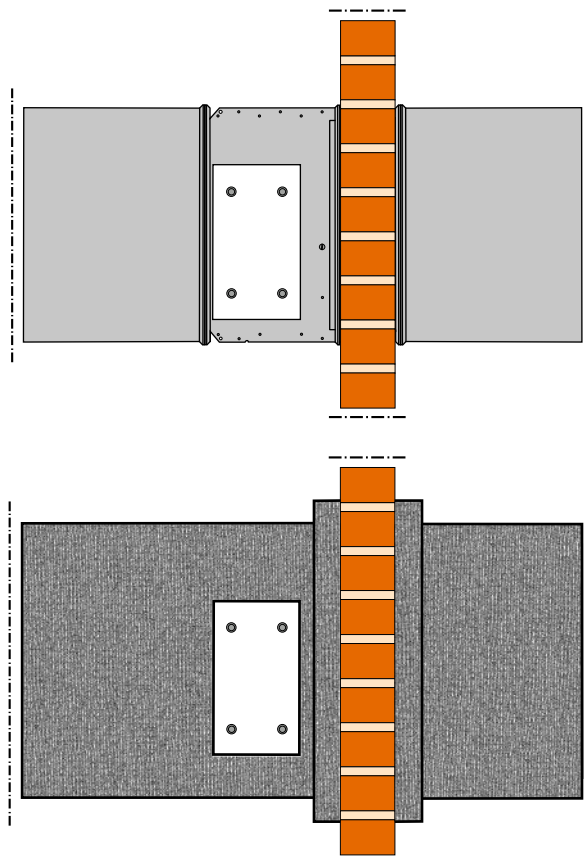
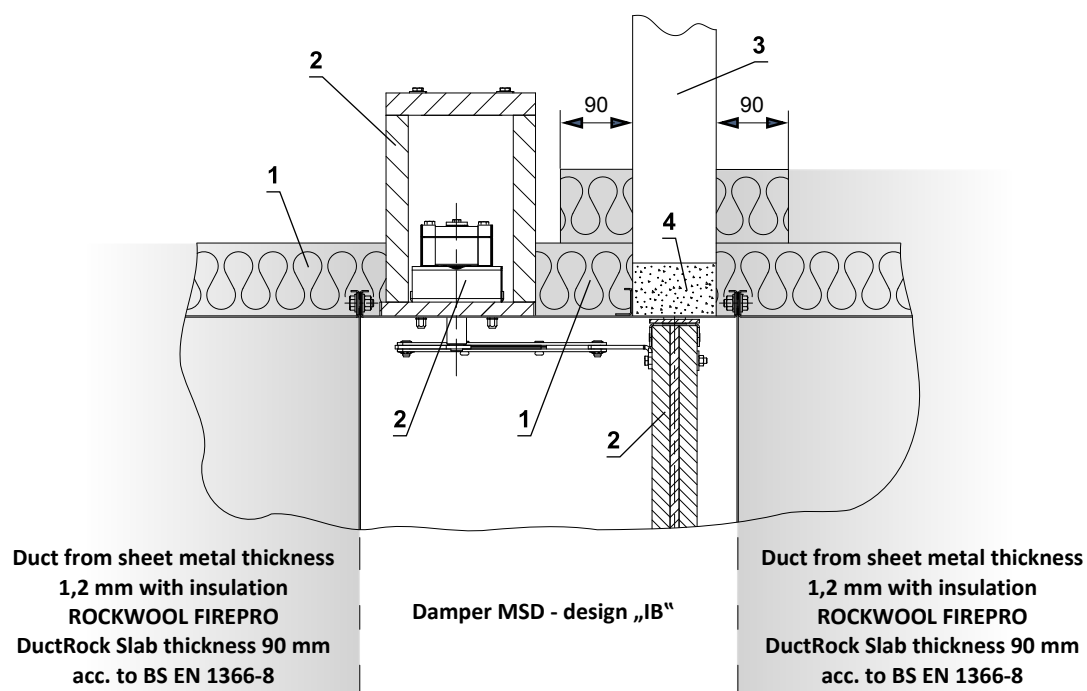
Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.



- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „IB“
- 3 Wall
- 4 British gypsum thistle bond 60 (or equivalent can by used) minimum density 670 kg/m³)

Connection MSD to steel duct, installed in construction with gypsum filling and insulation - design "IB"

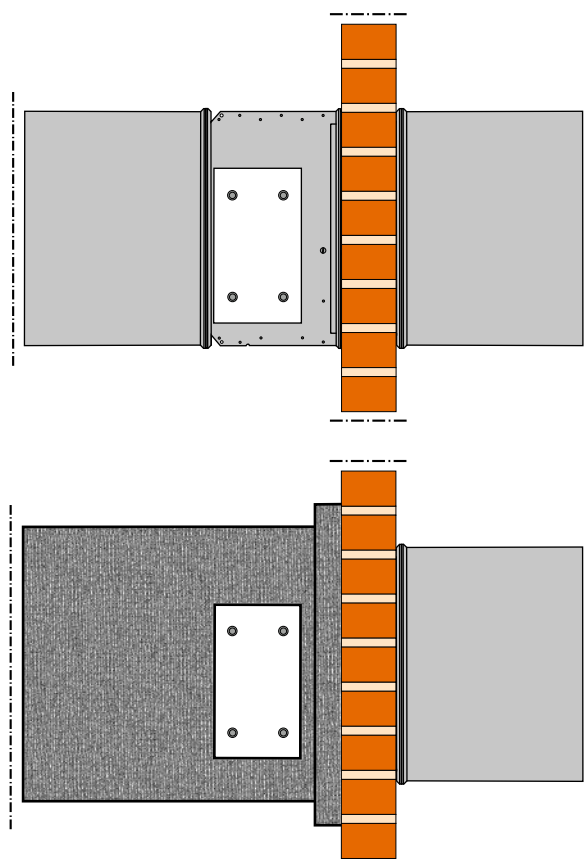
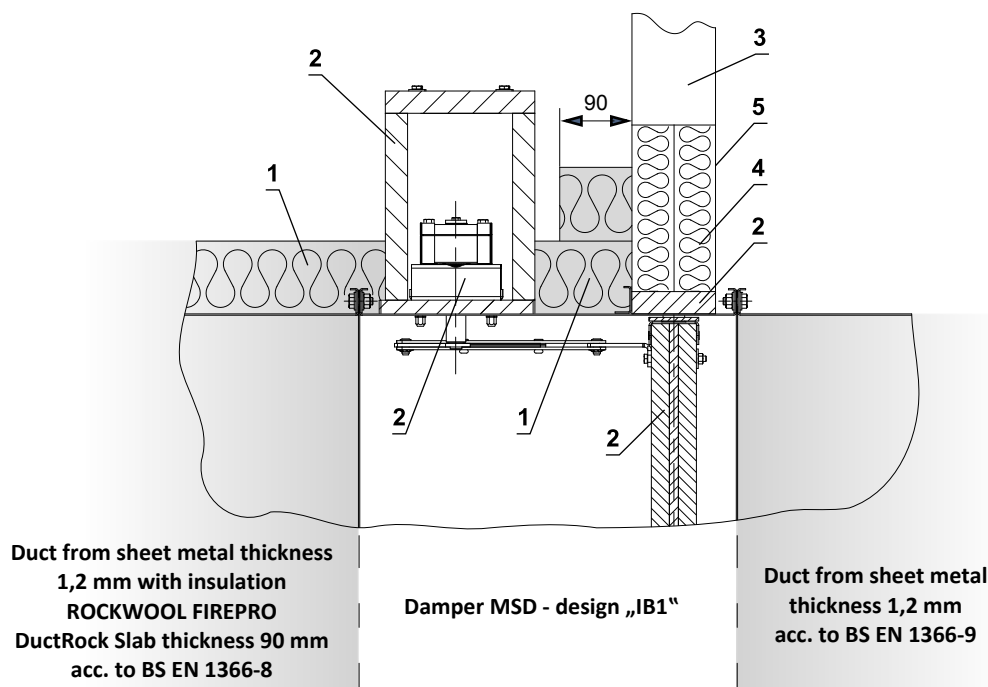
Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.



- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „IB“
- 3 Wall
- 4 British gypsum thistle bond 60 (or equivalent can by used) minimum density 670 kg/m³)

Connection MSD to steel duct, installed in construction with Ablative Coat. B. filling and insulation - design "IB1"

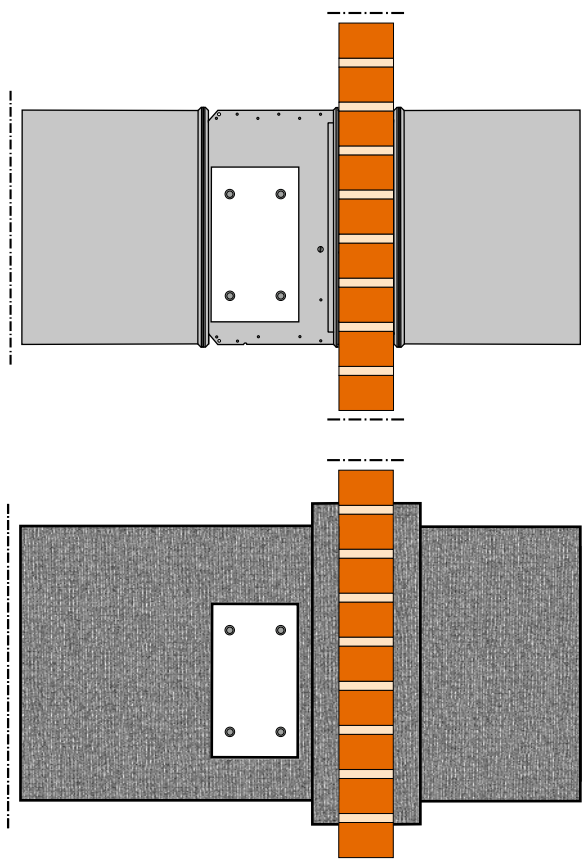
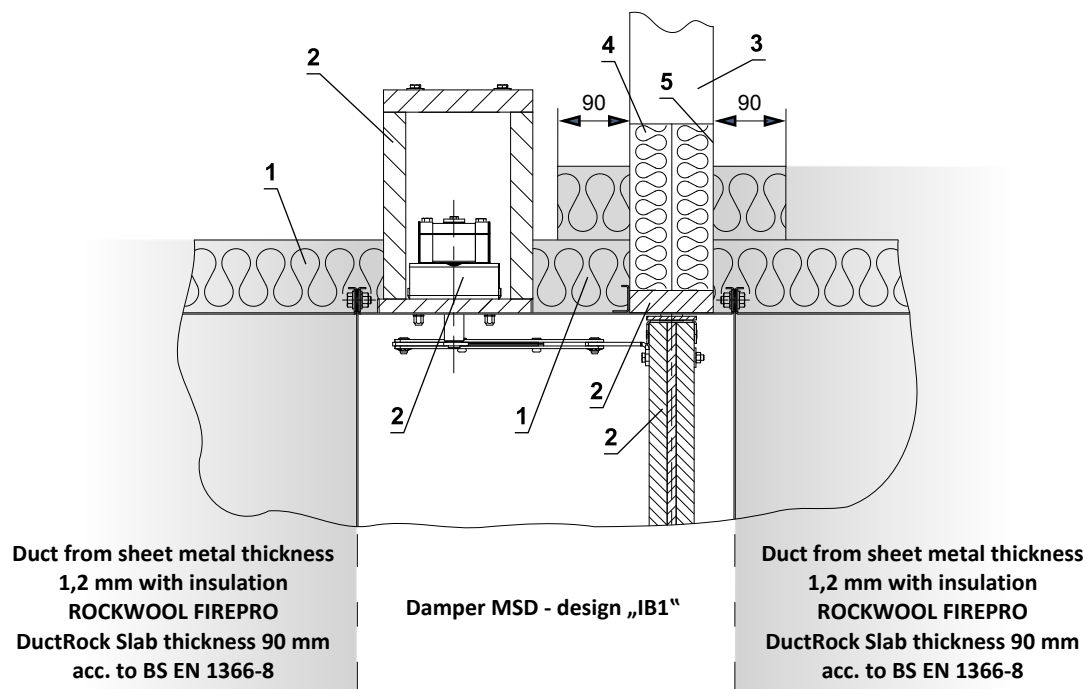
Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.



- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „IB1“
- 3 Wall
- 4 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m3 + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 5 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)

Connection MSD to steel duct, installed in construction with Ablative Coat. B. filling and insulation - design "IB1"

Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.

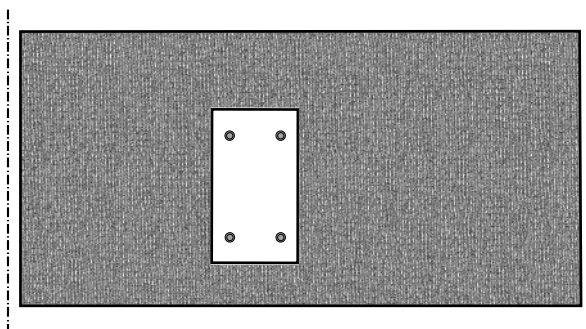
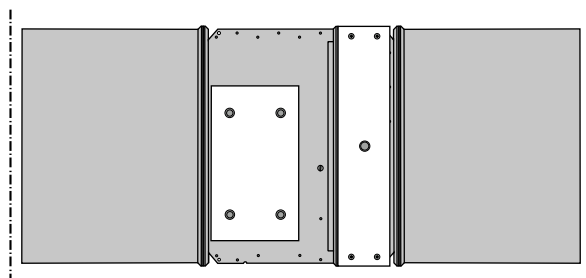
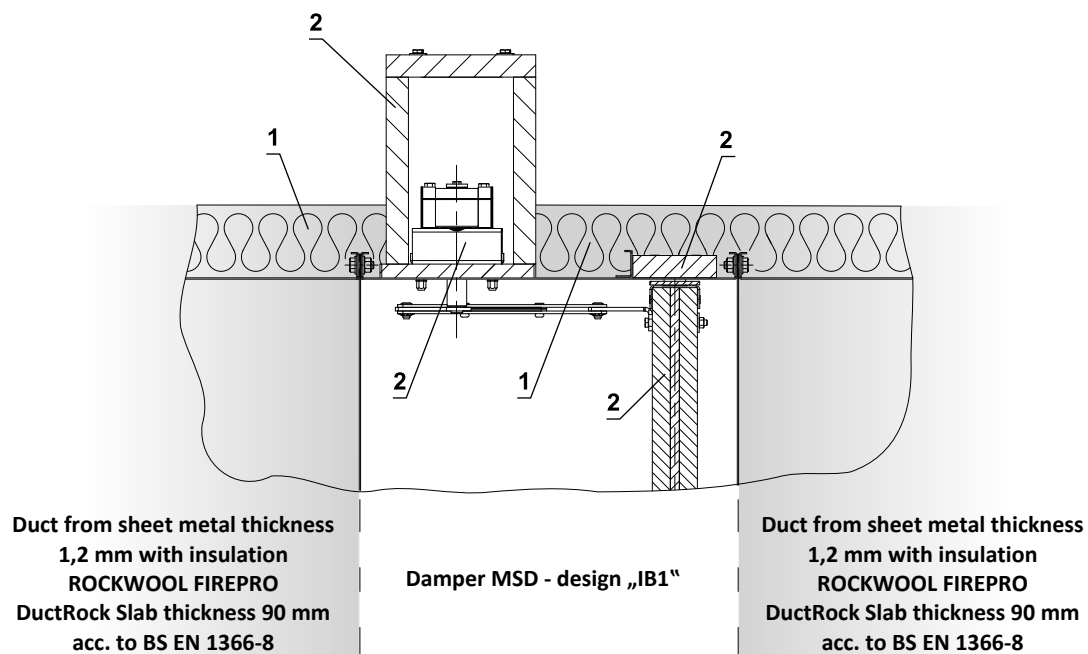


- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „IB1“
- 3 Wall
- 4 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 5 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)

MSD installed in steel duct with insulation

Connection MSD in steel duct with insulation - design "IB1"

Connect the joints of stone wool plates with ROCKWOOL FIREPRO Glue, secure with nails and welding pins at max. spacings of 250 mm. Board joints must be covered using ROCKWOOL black aluminium foil tape. Follow duct supplier's instructions and insulation.



- 1 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm acc. to BS EN 1366-8
- 2 Part of MSD - design „IB1“

VI. TECHNICAL DATA

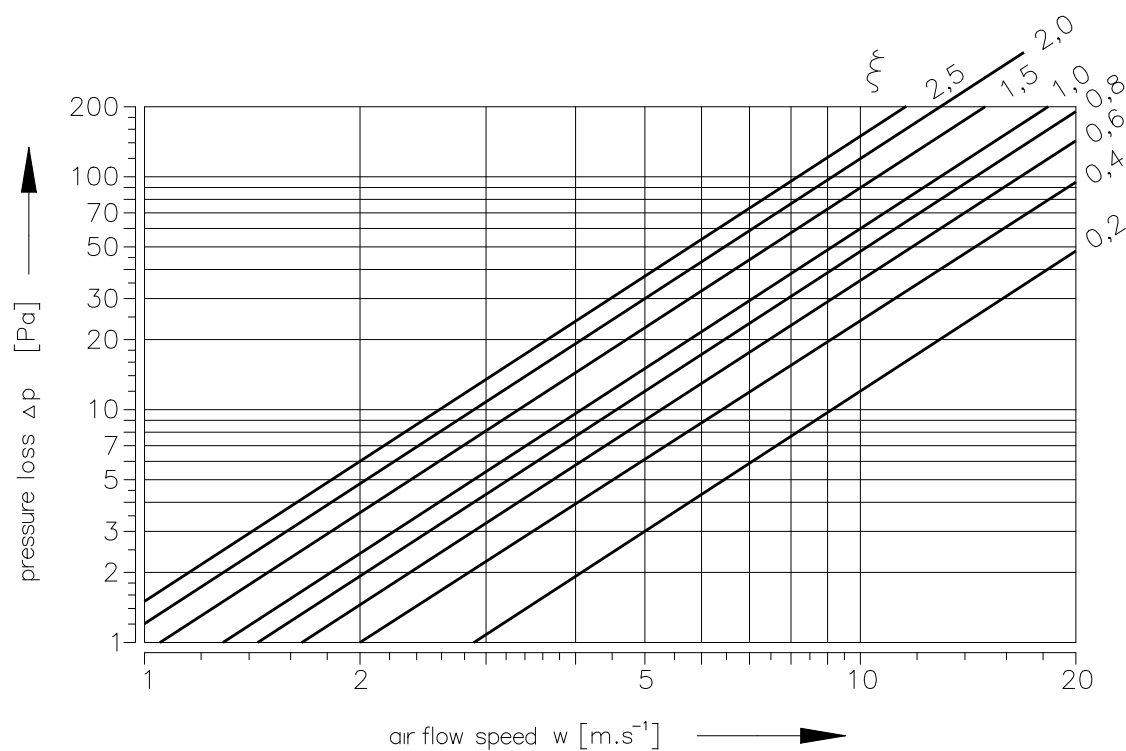
Pressure loss

Pressure loss calculation

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

Δp	[Pa]	pressure loss
w	[m/s]	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 page 40

Determination of pressure loss by using diagram $\rho = 1,2 \text{ kg/m}^3$



Coefficient of local pressure loss

	B									
A	180	200	225	250	280	300	315	355	400	450
180	2,1314	1,6906	1,3782	1,1149	1,0037	0,9288	0,7918	0,6827	0,6003	0,5350
200	1,9945	1,5804	1,2423	1,0368	0,9748	0,8785	0,7383	0,6367	0,5585	0,4976
225	1,9207	1,5162	1,1256	0,9994	0,9341	0,8442	0,7137	0,6078	0,5329	0,4772
250	1,8415	1,4584	1,1032	0,9651	0,9009	0,8068	0,6837	0,5832	0,5125	0,4590
280	1,7505	1,3782	1,0732	0,9116	0,8571	0,7597	0,6484	0,5543	0,4847	0,4366
300	1,6853	1,3311	1,0400	0,8635	0,8046	0,7148	0,6099	0,5264	0,4665	0,4109
315	1,6071	1,2690	1,0037	0,8303	0,7597	0,6645	0,5864	0,5050	0,4419	0,3927
355	1,5408	1,2155	0,9544	0,7929	0,7083	0,6356	0,5607	0,4815	0,4227	0,3756
400	1,4841	1,1706	0,9063	0,7651	0,6859	0,6227	0,5382	0,4633	0,4045	0,3606
450	1,4359	1,1331	0,8913	0,7394	0,6666	0,5896	0,5200	0,4473	0,3916	0,3478
500	1,3996	1,1021	0,8624	0,7201	0,6548	0,5810	0,5061	0,4344	0,3799	0,3371
550	1,3803	1,0882	0,8378	0,7073	0,6474	0,5757	0,4965	0,4269	0,3734	0,3349
560	1,3643	1,0754	0,8282	0,7009	0,6324	0,5725	0,4922	0,4227	0,3692	0,3285
600	1,3493	1,0582	0,8218	0,6944	0,6270	0,5585	0,4858	0,4184	0,3659	0,3242
630	1,3332	1,0497	0,8100	0,6837	0,6238	0,5436	0,4804	0,4130	0,3606	0,3199
650	1,3204	1,0379	0,7907	0,6752	0,6003	0,5393	0,4740	0,4066	0,3542	0,3157
700	1,3108	1,0304	0,7832	0,6741	0,5949	0,5382	0,4719	0,4045	0,3531	0,3146
710	1,3043	1,0272	0,7747	0,6688	0,5896	0,5371	0,4697	0,4034	0,3520	0,3135
750	1,2926	1,0176	0,7683	0,6634	0,5842	0,5307	0,4633	0,3980	0,3478	0,3103
800	1,2808	1,0079	0,7618	0,6559	0,5767	0,5222	0,4601	0,3959	0,3456	0,3060
900	1,2594	0,9908	0,7479	0,6441	0,5692	0,5136	0,4526	0,3884	0,3381	0,3007
1000	1,2433	0,9780	0,7383	0,6367	0,5607	0,4976	0,4462	0,3831	0,3338	0,2975
1100	1,2284	0,9662	0,7287	0,6281	0,5478	0,4869	0,4408	0,3777	0,3296	0,2932
1250	1,2155	0,9544	0,7126	0,6206	0,5339	0,4804	0,4355	0,3734	0,3264	0,2900
1400	1,2027	0,9459	0,6998	0,6142	0,5254	0,4783	0,4301	0,3692	0,3231	0,2857
1500	1,1952	0,9395	0,6955	0,6110	0,5157	0,4708	0,4280	0,3670	0,3199	0,2846

	B									
A	500	550	560	600	630	650	700	710	750	800
180	0,4879	0,4665	0,4462	0,4216	0,4109	0,3916	0,3884	0,3820	0,3681	0,3585
200	0,4526	0,4323	0,4152	0,3959	0,3820	0,3681	0,3606	0,3552	0,3424	0,3328
225	0,4355	0,4152	0,4002	0,3788	0,3681	0,3531	0,3456	0,3413	0,3338	0,3221
250	0,4216	0,4002	0,3809	0,3659	0,3542	0,3403	0,3328	0,3274	0,3210	0,3092
280	0,3948	0,3766	0,3585	0,3435	0,3328	0,3199	0,3167	0,3114	0,2975	0,2932
300	0,3766	0,3531	0,3435	0,3253	0,3157	0,3071	0,2996	0,2953	0,2814	0,2750
315	0,3574	0,3349	0,3264	0,3103	0,3007	0,2932	0,2846	0,2782	0,2696	0,2611
355	0,3413	0,3253	0,3114	0,2975	0,2868	0,2750	0,2718	0,2664	0,2557	0,2493
400	0,3274	0,3082	0,2985	0,2900	0,2761	0,2654	0,2589	0,2557	0,2472	0,2386
450	0,3167	0,2964	0,2889	0,2782	0,2654	0,2589	0,2525	0,2461	0,2386	0,2301
500	0,3071	0,2943	0,2803	0,2664	0,2579	0,2482	0,2429	0,2386	0,2311	0,2236
550	0,3039	0,2857	0,2771	0,2611	0,2450	0,2365	0,2301	0,2268	0,2279	0,2194
560	0,2996	0,2825	0,2729	0,2515	0,2504	0,2408	0,2290	0,2268	0,2236	0,2172
600	0,2943	0,2793	0,2707	0,2493	0,2482	0,2375	0,2268	0,2247	0,2194	0,2140
630	0,2910	0,2761	0,2664	0,2482	0,2450	0,2343	0,2268	0,2247	0,2161	0,2119
650	0,2900	0,2707	0,2632	0,2461	0,2418	0,2322	0,2258	0,2236	0,2140	0,2097
700	0,2868	0,2654	0,2622	0,2450	0,2408	0,2301	0,2247	0,2226	0,2129	0,2087
710	0,2846	0,2632	0,2600	0,2440	0,2397	0,2290	0,2226	0,2215	0,2119	0,2076
750	0,2814	0,2611	0,2568	0,2397	0,2365	0,2268	0,2204	0,2194	0,2108	0,2054
800	0,2793	0,2600	0,2547	0,2354	0,2333	0,2236	0,2183	0,2172	0,2087	0,2022
900	0,2739	0,2547	0,2504	0,2333	0,2301	0,2172	0,2151	0,2129	0,2044	0,1990
1000	0,2696	0,2515	0,2461	0,2290	0,2268	0,2151	0,2119	0,2087	0,2001	0,1958
1100	0,2664	0,2482	0,2429	0,2258	0,2236	0,2129	0,2097	0,2065	0,1969	0,1937
1250	0,2632	0,2429	0,2397	0,2226	0,2204	0,2076	0,2065	0,2044	0,1947	0,1905
1400	0,2611	0,2397	0,2375	0,2204	0,2183	0,2044	0,2033	0,2022	0,1926	0,1894
1500	0,2589	0,2386	0,2365	0,2183	0,2161	0,2022	0,2012	0,2001	0,1905	0,1883

Noise data

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_{W1} related to the 1 m ² section
S	[m ²]	duct cross section
K_A	[dB]	correction to the weight filter A

Level of acoustic output in octave ranges

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

L_{Woct}	[dB]	spectrum of acoustic output in octave range
L_{W1}	[dB]	level of acoustic output L_{W1} related to the 1 m ² section
S	[m ²]	duct cross section
L_{rel}	[dB]	relative level expressing the shape of the spectrum

Tables of acoustics values

Level of acoustic output L_{W1} [dB] related to the 1 m² section

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

Correction to the weight filter A

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

Relative level expressing the shape of the spectrum L_{rel}

	f [Hz]							
w [m/s]	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	-4,1	-5,9	-9,4	-14,6	-21,5	-30,0	-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

VII. MATERIAL, FINISHING

- Damper casing and damper blade are made of galvanized sheet metal without any other surface finish.
- Fasteners are galvanized.
- 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 – BS EN 17240)
- Class A4 – Chemistry-grade stainless steel (AISI 316, 316L – BS 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 actuator).

The following components, including the fasteners, are made from stainless steel at all times:

- Damper body and all components permanently attached
- Blade's holders, including pins, metal parts of blade
- Control components inside the damper (L-profile, pin with lever, rod, fasteners)
- Inspection hole cover including the clip and fasteners (if they are parts of the cover)

The damper blade is made from Promatect-H sheets, 2x 20mm and 1x 10mm, connected with galvanised nailed "U" connectors which are sealed with Promat K84 from the outside; Promaseal tape is attached to the leaves with stainless-steel nailed "U" connectors.

Plastic, rubber and silicon components, sealants, foaming bands, glass-ceramic seals, housings, brass bearings of the blade, actuators, and end switches are identical for all material variants of the dampers.

Some fasteners and components are available in one class of stainless steel; the type will be used in all stainless-steel variants.

The damper blade 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.

- The actuator cover is made of fire-resistant material (fire protection board).

VIII. TRANSPORTATION AND STORAGE

Logistic terms

- Dampers are delivered on a pallets. As standard, the dampers are wrapped in plastic foil for protection during transport and must not be used for long-term storage of the equipment. Changes in temperature during transport may cause condensation of water vapour inside the packaging and thereby conditions may arise inside the packaging that are suitable for corrosion of materials used in the equipment (e.g. white corrosion on zinc-coated items or mould on calcium silicate). Therefore, it is necessary to remove the transport packaging immediately after unloading to allow air to circulate around the product.
- The equipment must be stored in clean, dry, well ventilated and dust-free environment out of direct sunlight. ensuring protection against moisture and extremes of temperatures (minimum temperature +5°C) the equipment must be protected against mechanical and accidental damage prior to installation.
- Another required packaging system should be approved and agreed by manufacturer. Packaging material is not returnable in case that another packaging system (material) is required and used and it is not included into final price of damper.
- For unloading and further manipulation with the damper is necessary to use appropriate tooling (forklifts) due to damper weight. Dampers are fragile.
- Dampers are transported by box freight vehicles without direct weather impact, there must not occur any shocks and ambient temperature must not exceed +50°C. Dampers must be protected against impact when transported and manipulated. During transportation, the damper blade must be in the "CLOSED" position.
- Dampers are stored indoor in environment without any aggressive vapours, gases or dust. Indoor temperature must be in the range from -30°C to +50°C and maximum relative humidity 95% (avoid condensation on the damper body). Dampers must be protected against impact when transported and manipulated.

IX. ASSEMBLY, ATTENDANCE AND MAINTENANCE

- Assembly, maintenance and damper function check can be done only by qualified and trained person, i.e. "AUTHORIZED PERSON" according to the manufacturer documentation. All works done on the smoke control dampers must be done according international and local norms and laws.
- All effective safety standards and directives must be observed during damper assembly.
- Manual operation
 - Without power supply, the damper can be operated manually and fixed in any required position.
- To ensure reliable smoke control damper function it is necessary to avoid blocking the closing mechanism and contact surfaces with collected dust, fibre and sticky materials and solvents.
- Flange and screw joints must be conductively connected to protect against dangerous contact. 2 galvanized fan shape pads that are placed under the head of one screw and a fastened nut are used for conductive connection.

DANGER OF DAMAGE

Always:

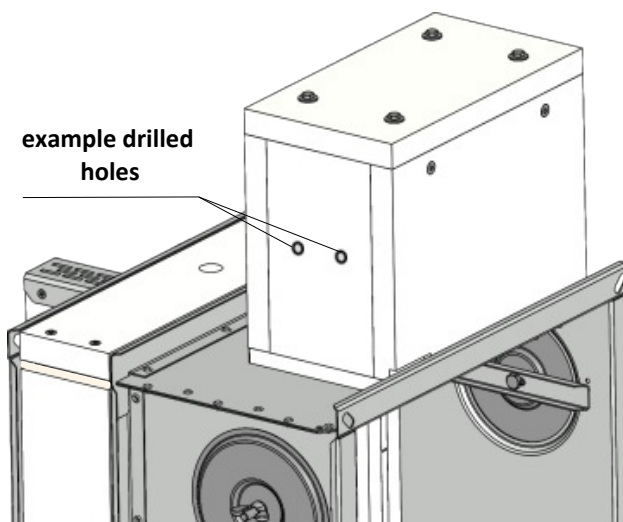
**REMOVE POWER BEFORE USING ALLEN KEY!
NEVER USE A POWER TOOL!**

Both incorrect operations will damage the clutch Mechanism
NO WARRANTY CLAIM!

Electrical connection of the actuator in protection box

Protection box without slot or predrilled holes

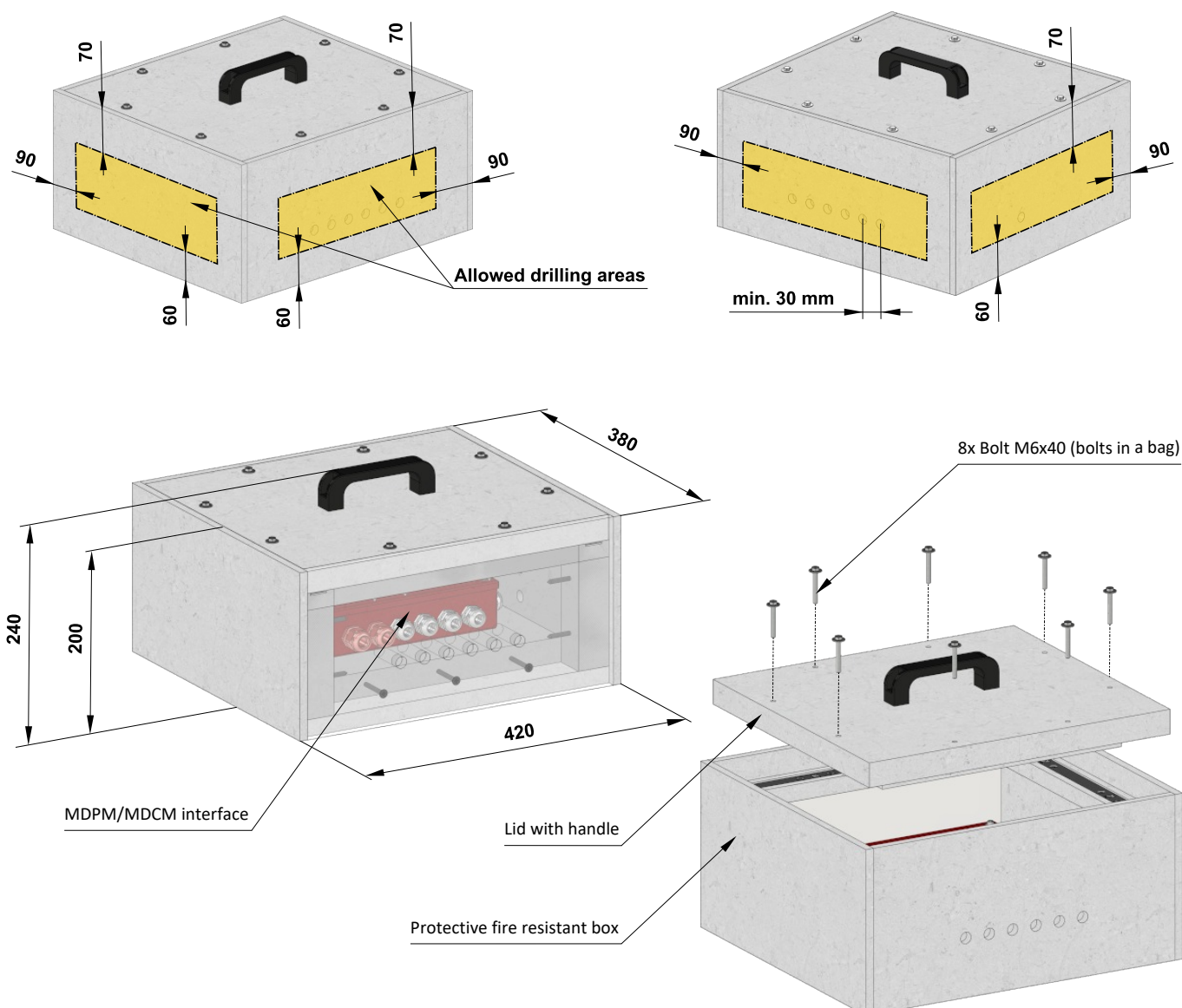
- Drill two holes into the protection box (from outside to inside) and pull through field wiring cables (CAT 3 fire resistant cables as BS 8519) to connect to the actuator trailing lead inside the housing, using a standard screwed cable connector block, the protection box is made of calcium silicate plates.
- Procedure
 - Use drill (drill size acc. To suit connecting cable $\varnothing + 2$ mm for seal up by mastic) and make two holes. It is possible to drill holes in any side of the housing.
 - Pull the heat resistant cable through the calcium silicate plate (wall) and connect with cables from actuator acc. to above mentioned electrical diagram.
 - Seal up the space around cable with fire resistant mastic (HILTI CFS-S ACR, PROMASTOP) or equivalent.
 - Let the mastic harden.



Example of position of holes in the wall of the box, without pre-manufactured slot

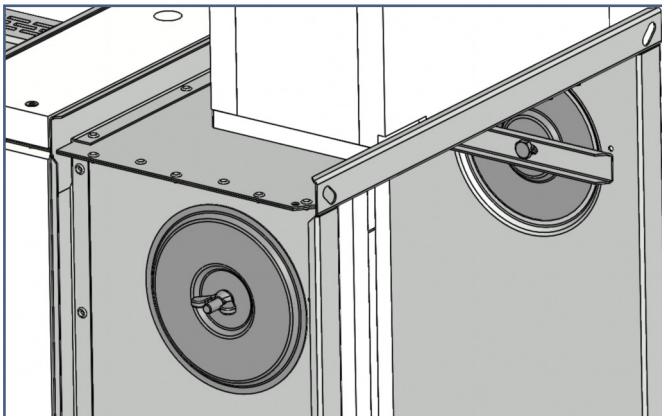
Connection of the control module MDPM & MDCM interfaces inside protection box

- Drill holes into the protection box (from outside to inside) and pull through field wiring cable (fire resistant cables) to connect control module. Protection box is made of calcium silicate insulating plates.
- Procedure:
 - Screw red box of MDPM/MDCM interface inside of the FIRE RATED housing to the back side, use pre drilled holes in red box and self-taping screws 4,8x25 mm. Minimum distance from walls 20 mm.
 - Use drill (drill size acc. to suit connecting cable $\varnothing + 2$ mm for seal up by mastic) and make holes (min. pitch of the holes must be 30 mm), number of holes depends on the type of control module. **It is possible to drill holes in any side of the protection box.**
 - Pull the heat resistant cable through the calcium silicate insulating plate (wall) and connect with cables from control module.
 - Seal up the space around cable with fire resistant mastic (HILTI CFS-S ACR, PROMASTOP) or equivalent.
 - Let the mastic harden.
- Placement:
 - The FIRE RATED housing can be installed onto a wall.
 - For installation, drill 4 holes in the rear of the housing (from inside to outside) with a maximum hole diameter of 8,5mm, use fixing appropriate for the application. Seal all holes and gap between FIRE RATED housing and wall with firestop (HILTI CFS-S ACR, PROMASTOP).



Entry into service and revisions

- Before entering the dampers into operation after assembly and after sequential revisions, checks and functionality tests of all designs including operation of the electrical components must be successfully provided and finished. After entering into operation, these revisions must be done according to requirement set by national regulations.
- In case that dampers are found unable to serve for their function for any cause, it must be clearly marked. The operator is obliged to ensure that the damper is put into condition in which it is ready for function and meanwhile he is obliged to provide the fire protection by another appropriate way.
- Inspection hole disassembly
 - release the covering lid by turning the wing nut and while turning the lid right or left release it from the security belt. Then tilt the lid and remove it from its original position.
- Results of regular checks, imperfections found and all-important facts connected with the damper function must be recorded in the "FIRE BOOK" and immediately reported to the operator.
- Before entering the dampers into operation after their assembly and by sequential checks, the following checks must be carried out for all designs.
- Visual inspection of proper damper integration, inside damper area, damper blade, contact surfaces and silicon sealing.

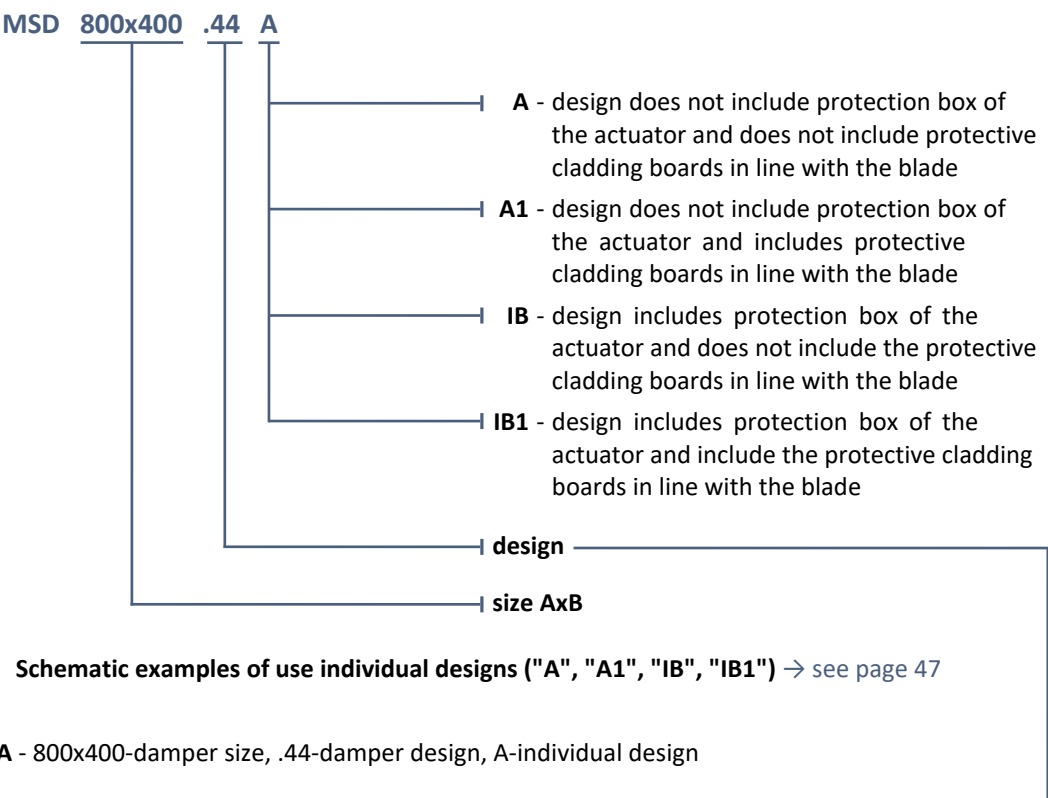


Inspection hole detail

- Ensure each damper is fully checked for operational capability, control should be initiated from the control system. Dampers blades should open and close correctly and operation should be visually inspected and documented prior to handover.

X. ORDERING INFORMATION

Ordering key



EXAMPLE:
MSD 800x400 .44 A - 800x400-damper size, .44-damper design, A-individual design

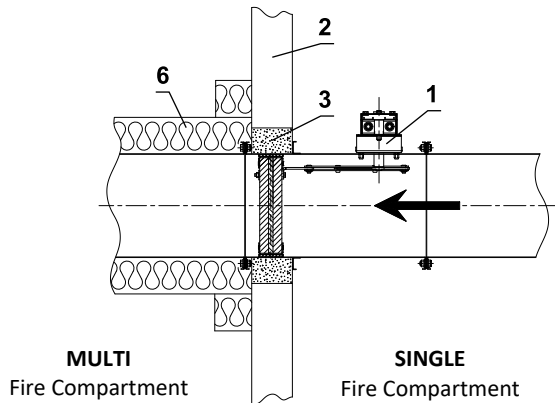
Dampers design	Additional digit
with actuating mechanism BEN, BEE, BE, InMax 50.75-S for 230V	.44
with actuating mechanism BEN, BEE, BE, InMax 50.75-S for 24V	.54
with actuating mechanism BEN (BEE)-SR for 24V	.65*

* Design .65 is not available by using actuating mechanism BE, InMax 50.75-S

Methods of damper installation, according to design

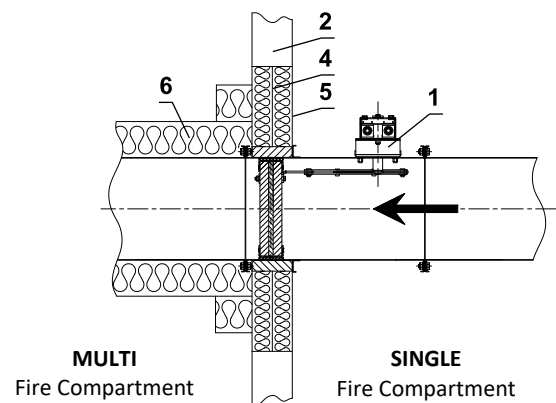
Design „A“

EIS 120



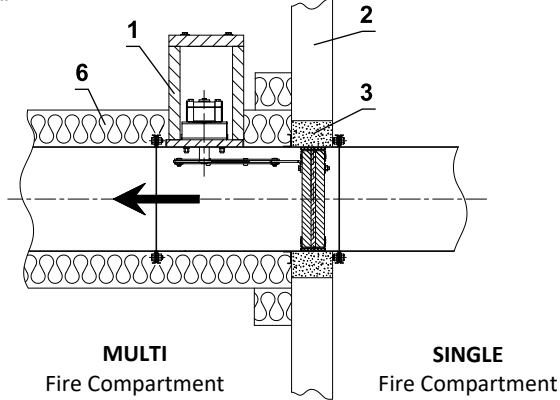
Design „A1“

EIS 90



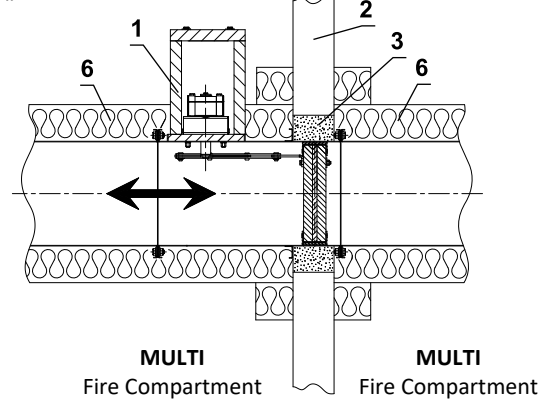
Design „IB“

EIS 120



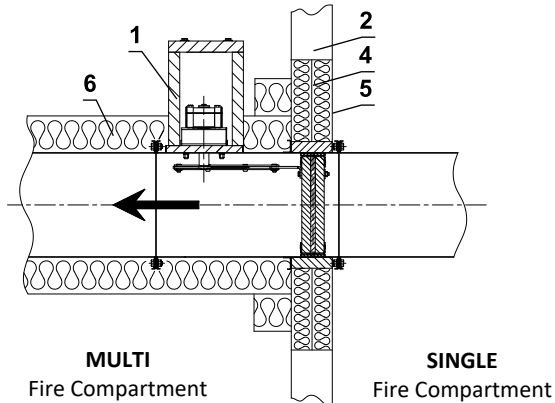
Design „IB“

EIS 120



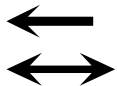
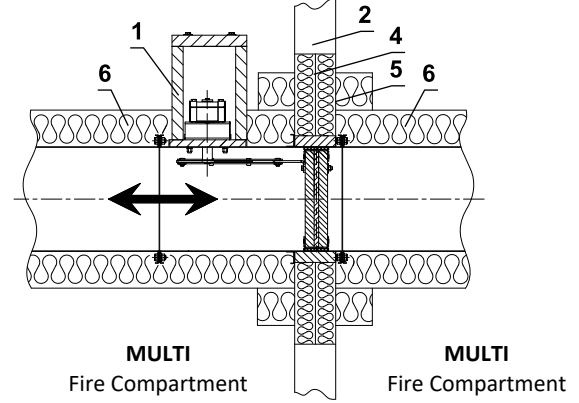
Design „IB1“

EIS 90



Design „IB1“

EIS 90

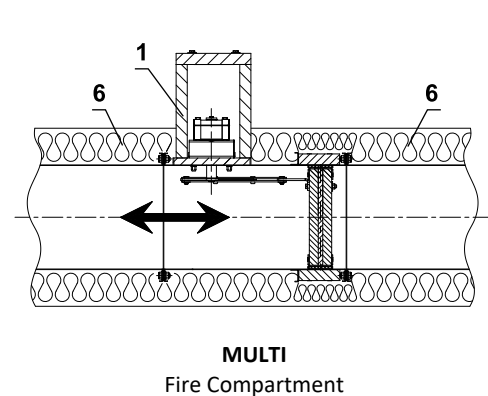


For smoke and heat extraction function only!

- 1 MSD
- 2 Wall
- 3 British gypsum thistle bond 60 min. density 670 kg/m³
- 4 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 5 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 6 ROCKWOOL FIREPRO DuctRock Slab th. 90 mm

Design „IB1“

EIS 120



Data label

- Data label is placed on the damper casing (example)

MANDÍK®		MANDÍK, a.s. Dobříšská 150, 267 24 Hostomice, Czech Republic	
MULTI COMPARTMENT SMOKE CONTROL DAMPER - XXXX			
DIMENSION:		DESIGN:	
SERIAL.NO.:		WEIGHT (kg):	
CLASSIFICATION:			
TPM XXX/XX	Cert. No.: 2822-UKCA-CPR-XXXX, DoP: PM/XXXX/XX/XX/X	XX	EN 12101:2011

MANDÍK®		MANDÍK, a.s. Dobříšská 550, 267 24 Hostomice, Czech Republic	
MULTI COMPARTMENT SMOKE CONTROL DAMPER - XXXX			
DIMENSION:		DESIGN:	
SERIAL.NO.:		WEIGHT (kg):	
CLASSIFICATION:			
TPM XXX/XX	Cert. No.: 1391-CPR-XXXX/XXXX, DoP: PM/XXXX/XX/XX/XX	XX	EN 12101:2011

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

MANDÍK[®]
www.mandik.co.uk

Manufacturer

MANDÍK, a. s. • Dobříšská 550 • 267 24 Hostomice • Czech Republic • Tel.: +420 311 706 742 • E-Mail: mandik@mandik.cz

Authorized representative

MANDIK UK Ltd • 130 Aztec West • Bristol BS32 4UB • United Kingdom • Tel.: +44 117 4526376 • E-Mail: help@mandik.co.uk

