

Lindab **Smoke Control Dampers**

SDR2-M

Technical information

Smoke Control Damper

SDR2-M

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General information

1. Description

Smoke control dampers - multi are shutters in the smoke exhaust piping systems. The dampers are designed to remove heat and combustible products (e.g. smoke) from effected fire compartments. In the event of fire the Smoke and Fire ventilation system opens the damper in the affected section and removes combustion products and heat from this section.

The damper blade is controlled by electrical actuating mechanism.

Dampers are fire resistant and are intended for systems with manual or automatic activation. Dampers are designed for using in fire compartments that can be connected to the smoke exhaust ducts (tested according to EN1366-8) or they can be installed in or on the construction of the fire compartment.

Dampers can be delivered with or without flanges.

1.2. Damper characteristics

- CE certified acc. to EN12101-8
- Tested in accordance with EN1366-10
- Classified acc. to EN13501-4+A1
- Fire resistance according Tab. 1.2.1
- External Casing leakage class C, Internal leakage min. class 2 acc. to EN1751

- Cycling test in class C_{mod} acc. to EN12101-8
- Certificate of constancy of performance No. 1391-CPR-2021/0008
- Declaration of Performance SDR2-M DoP
- Hygienic assessment of fire dampers - Report No.1.6 pos/19/19c

1.3. Working conditions

Exact damper function is provided under the following conditions:

- maximum air velocity 15m/s
- underpressure max. -1500Pa or overpressure max. 500Pa.

Dampers can be installed in arbitrary position (horizontal or vertical blade axis).

Dampers are designed for macroclimatic areas with mild climate according to EN60 721-3-3. Temperature in the place of installation is permitted to range from -30°C to +50°C.

1.4. The duck can be ended by grilles. During grilles installation blade overlaps has to be respected see chapter 3.

Tab. 1.2.1. Classification of Dampers

Supporting construction	Classification
Vertical duct system	EI120 (h _{od} - i<->o)S 1000 C _{mod} HOT 400/30MAMulti EI120 (h _{od} - i<->o)S 1000 C _{mod} HOT 400/30AAMulti
Horizontal duct system	EI120 (v _{ed} - i<->o)S 1000 C _{mod} HOT 400/30MAMulti EI120 (v _{ed} - i<->o)S 1000 C _{mod} HOT 400/30AAMulti
Aerated concrete ceiling construction*	EI90 (h _{ow} - i<->o)S 1000 C _{mod} HOT 400/30AAMulti EI120 (h _{ow} - i<->o)S 1500 C _{mod} HOT 400/30MAMulti EI120 (h _{ow} - i<->o)S 1500 C _{mod} HOT 400/30AAMulti
Aerated concrete wall construction*	EI120 (v _{ew} - i<->o)S 1000 C _{mod} HOT 400/30AAMulti
Gypsum wall construction*	EI90 (v _{ew} - i<->o)S 1500 C _{mod} HOT 400/30AAMulti EI90 (v _{ew} - i<->o)S 1500 C _{mod} HOT 400/30MAMulti EI120 (v _{ew} - i<->o)S 1000 C _{mod} HOT 400/30AAMulti EI120 (v _{ew} - i<->o)S 1000 C _{mod} HOT 400/30MAMulti

*In practice dampers are not in the open position at the beginning of smoke threat.

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2. Design

2.1. 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 InMax50.75-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/boxwhen installing the damper or when connecting the actuator power cable. The cable entry must meet a minimum fire resistance of 30 minutes.

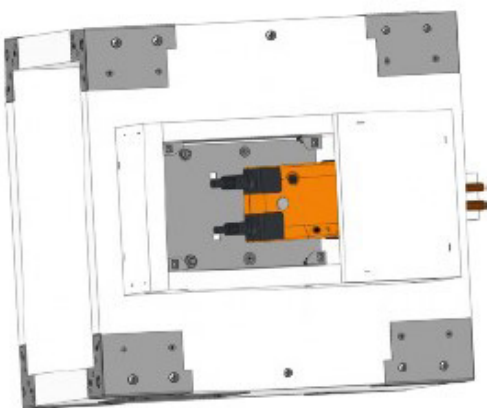
Design .65

Belimo modulating actuators, BEN (BEE)-SR series for 24V AC/DC are specially designed for remote control of fire dampers. The position of the damper blade is adjustable by means of control voltage 0 (2)...10V DC.

The signaling 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 cable entry must meet a minimum fire resistance of 30 minutes.

Fig. 1 Dampers with actuating mechanism



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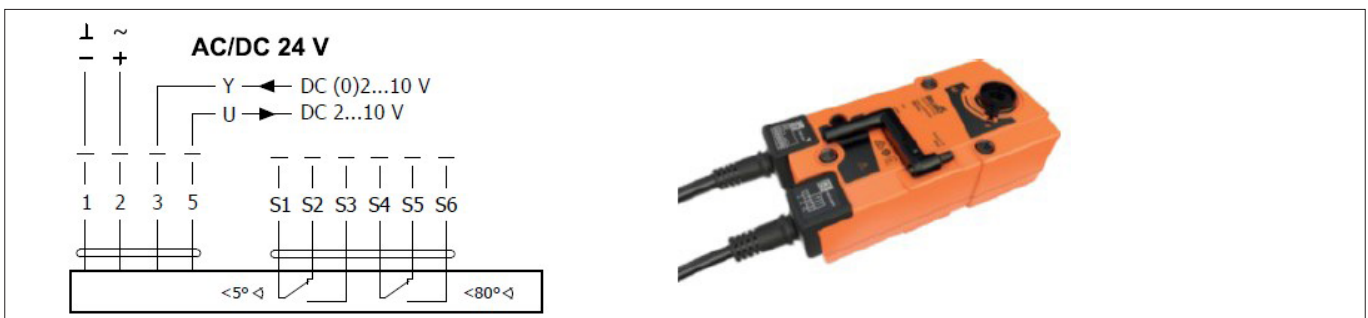
Tab. 2.1.1. Actuator BELIMO BEN 24(-ST), BEN 24-SR, BEN 230

Actuator BELIMO - 15Nm	BEN 24(-ST)	BEN 24-SR	BEN 230
Power voltage	AC/DC 24V 50/60Hz	AC/DC 24V 50/60Hz	AC 230V 50/60Hz
Power consumption - in operation - in the end position	3W 0,1W	3W 0,3W	4W 0,4W
Dimensioning	6VA (Imax8,2 A @ 5ms)	6,5 VA (Imax8.2 A @ 5ms)	7 VA (Imax4 A @ 5ms)
Protection class	III	III	II
Degree of protection	IP 54		
Adjustment time for 95°	< 30s		
Ambient temperature Storage temperature	-30°C ... +55°C -40°C ... +80°C		
Connection - drive - auxiliary switch	Cable 1m, 3x0,75mm ² Cable 1m, 6x0,75mm ² (BEN 24-ST) with plug connectors	Cable 1m, 4x0,75mm ² Cable 1m, 6x0,75mm ²	Cable 1m, 3x0,75mm ² Cable 1m, 6x0,75mm ²

Fig. 2 Actuator BELIMO BEN 24(-ST)



Fig. 3 Actuator BELIMO BEN 24-SR



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Fig. 4 Actuator BELIMO BEN 230



Tab. 2.1.2. Actuator BELIMO BEE 24(-ST), BEE 24-SR, BEE 230

Actuator BELIMO - 25Nm	BEE 24(-ST)	BEE 24-SR	BEE 230
Power voltage	AC/DC 24V 50/60Hz	AC/DC 24V 50/60Hz	AC 230V 50/60Hz
Power consumption - in operation - in the end position	2,5W 0,1W	3W 0,3W	3,5W 0,4W
Dimensioning	5VA (Imax8,2 A @ 5ms)	5,5VA (Imax8.2 A @ 5ms)	6VA (Imax4 A @ 5ms)
Protection class	III	III	II
Degree of protection	IP 54		
Adjustment time for 95°	< 60s		
Ambient temperature Storage temperature	-30°C ... +55°C -40°C ... +80°C		
Connection - drive - auxiliary switch	Cable 1m, 3x0,75mm ² Cable 1m, 6x0,75mm ² (BEE 24-ST) with plug connectors	Cable 1m, 4x0,75mm ² Cable 1m, 6x0,75mm ²	Cable 1m, 3x0,75mm ² Cable 1m, 6x0,75mm ²

Fig. 5 Actuator BELIMO BEE 24(-ST)



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Fig. 6 Actuator BELIMO BEE 24-SR



Fig. 7 Actuator BELIMO BEE 230



Tab. 2.1.3. Actuator BELIMO BE 24-12(-ST), BE 230-12

Actuator BELIMO - 40Nm	BE 24-12(-ST)	BE 230-12
Power voltage	AC/DC 24V 50/60Hz	AC 230V 50/60Hz
Power consumption - in operation - in the end position	12W 0,5W	8W 0,5W
Dimensioning	18VA (Imax8,2 A @ 5ms)	15VA (Imax7,9 A @ 5ms)
Protection class	III	II
Degree of protection	IP 54	
Adjustment time for 95°	< 60s	
Ambient temperature Storage temperature	-30°C ... +50°C -40°C ... +80°C	
Connection - drive - auxiliary switch	Cable 1m, 3x0,75mm ² Cable 1m, 6x0,75mm ² (BE 24-ST) with plug connectors	

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Fig. 8 Actuator BELIMO BE 24-12(-ST)



Fig. 9 Actuator BELIMO BE 230-12

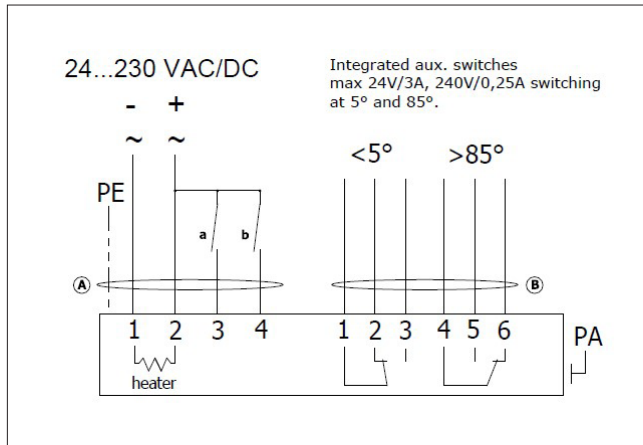


Tab. 2.1.4. Actuating mechanism SCHISCHEK InMax50.75-S

Actuating mechanism SCHISCHEK	InMax50.75-S
Nominal 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
Running time for 95°	< 60 s
Ambient temperature range Non-operating temperature	- 40°C ... + 50°C - 40°C ... + 70°C
Connecting	cable 1m, 0,5mm ²

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Fig. 10 Actuator BELIMO BE 24-12(-ST)

2.2. Design with communication and supply device BKNE 230-24

Design .66

Design with communication and power supply device BKNE 230-24 and with actuator BEN (BEE, BE)-ST for 24V.

The BKNE 230-24 serves on the one hand as a decentralized network device for powering the actuator and on the other hand transmits the signal of the communication and control device BKSE 24-6.

It simplifies electrical installation and connection of dampers. In the meantime, it facilitates "on-site inspection" and allows central control and inspection of dampers using a simple 2-wire line.

The BKNE 230-24 transmits the "OPEN" / "CLOSED" damper position (switches in the actuator) and fault messages to the BKSE 24-6. It also receives commands from the control device and controls the adjustment of the actuator to the desired position. The last control command will be retained even after a temporary network failure.

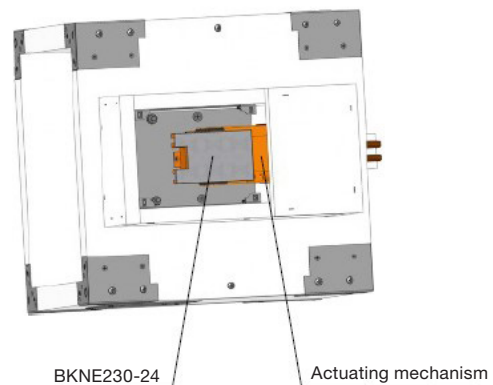
The BKNE 230-24 controls the switching position of the actuator, its adjustment time and the data exchange with the BKSE 24-6. In addition, it controls the actuator current (actuator connection) and the power supply.

To simplify the connection, the actuator is equipped with plug connectors that plug directly into the BKNE 230-24.

The actuator, communication and power supply device BKNE 230-24 are mounted in an insulated cover, they are accessible after removing the cover. The electrical connection of the actuator and the BKNE 230-24 communication and power supply device is made with a non-flammable cable (or a cable located in an adjoining cable duct), the two-wire BKNE 230-24 cable should be connected to terminals 6 and 7. It is also recommended to use cable, which is used for fire signalling network. The cables pass through an opening made in the wall of the insulated cover when installing the damper or when connecting the actuator power cable. The cable entry must meet a minimum fire resistance of 30 minutes.

For more information on actuators and devices, see the Belimo catalogue.

This variant is not available for dampers with Schischek InMax50.75-S actuator.

Fig. 11 Damper with actuating mech. and BKNE230-24

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2.3. Communication and supply device

Tab. 2.3.1. Communication and power supply device BKNE 230-24

Communication and power supply device	BKNE 230-24
Power voltage	AC 230V 50/60Hz
Power consumption	10W (including actuator)
Dimensioning	19VA (including actuator)
Protection class	II
Ambient operation temperature	-30°C ... +50°C
Storage temperature	-40°C ... +80°C
Connecting	
- network	cable 1m without plug
- drive	6-pin plug, 3-pin plug
- terminal blocks	screw terminals for 2x1.5mm ² conductor

Fig. 12 Communication and power supply device BKNE 230-24

Signalling

LED	State	Function
yellow	flashing	damper rotates to the open position
yellow	lit-up	damper is open
green	flashing	damper rotates to the closed position
green	lit-up	damper is closed
yellow or green	flashes twice as often	fault
yellow + green	dark	network outage

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2.4. Communication and control devices

BKSE 24-6 indicates operating condition and faults of flue dampers. These conditions can be signalled or transmitted to the higher-level control system via the auxiliary built-in contacts. Signals from individual BKNE 230-24 are evaluated separately. All BKNE 230-24 are controlled simultaneously. A maximum of 6 BKNE 230-24 can be connected to the BKSE 24-6.

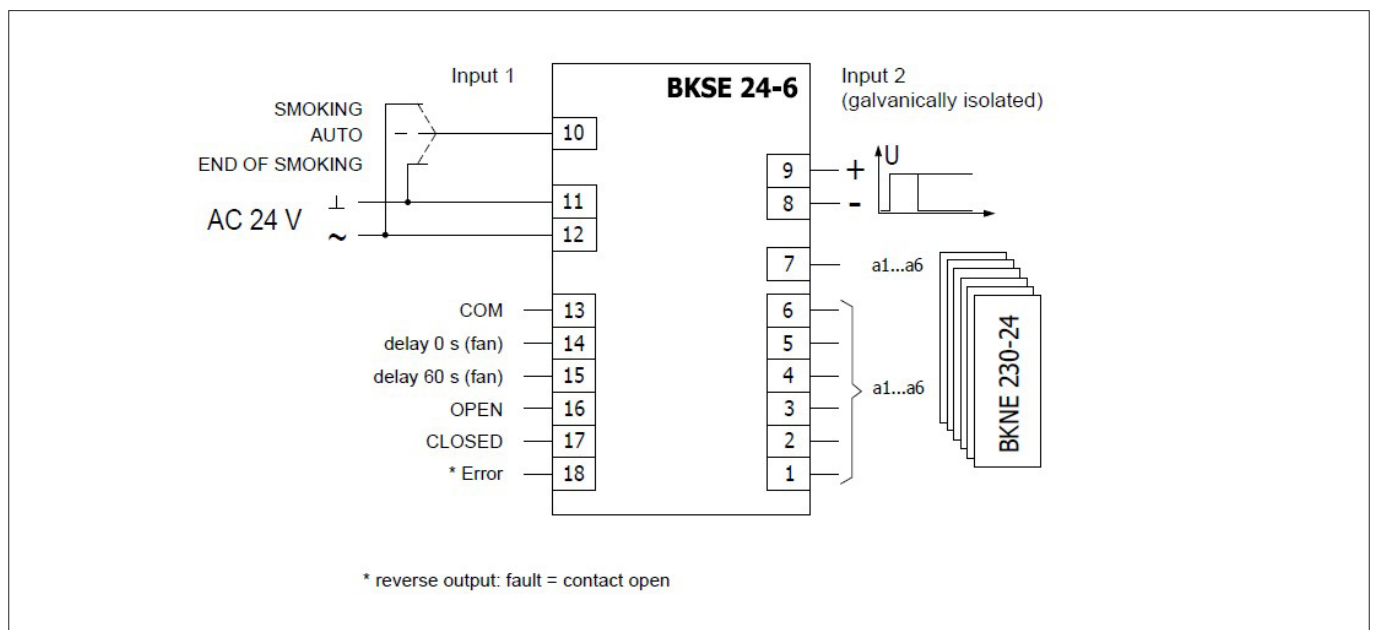
Damper control is ensured with a simple 2-wire line. The damper's correct function is indicated by two LEDs. The operating status of the entire control system and any errors are indicated by these LEDs and the corresponding error LED.

Mounting and connection of BKSE 24-6 can be done on a 35mm DIN rail. It's connected using two 9-pin terminal blocks (plug connectors).

Tab. 2.4.1. Communication and power supply device BKNE 230-24

Communication and control devices	BKSE 24-6
Power voltage	AC 24V 50/60Hz
Power consumption	3,5W (operating position)
Dimensioning	5,5VA 18 VA (Imax6.4 A @ 2.5ms)
Protection class	III (low voltage)
Degree of protection	IP 20
Ambient operation temperature	0 ...+50°C
Connection	screw terminals for 2x1.5mm ² conductor

Fig. 13 Communication and control devices BKSE 24-6



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3. Dimensions, weights

3.1. Dimensions

Fig. 14 Smoke control dampers - multi without flanges

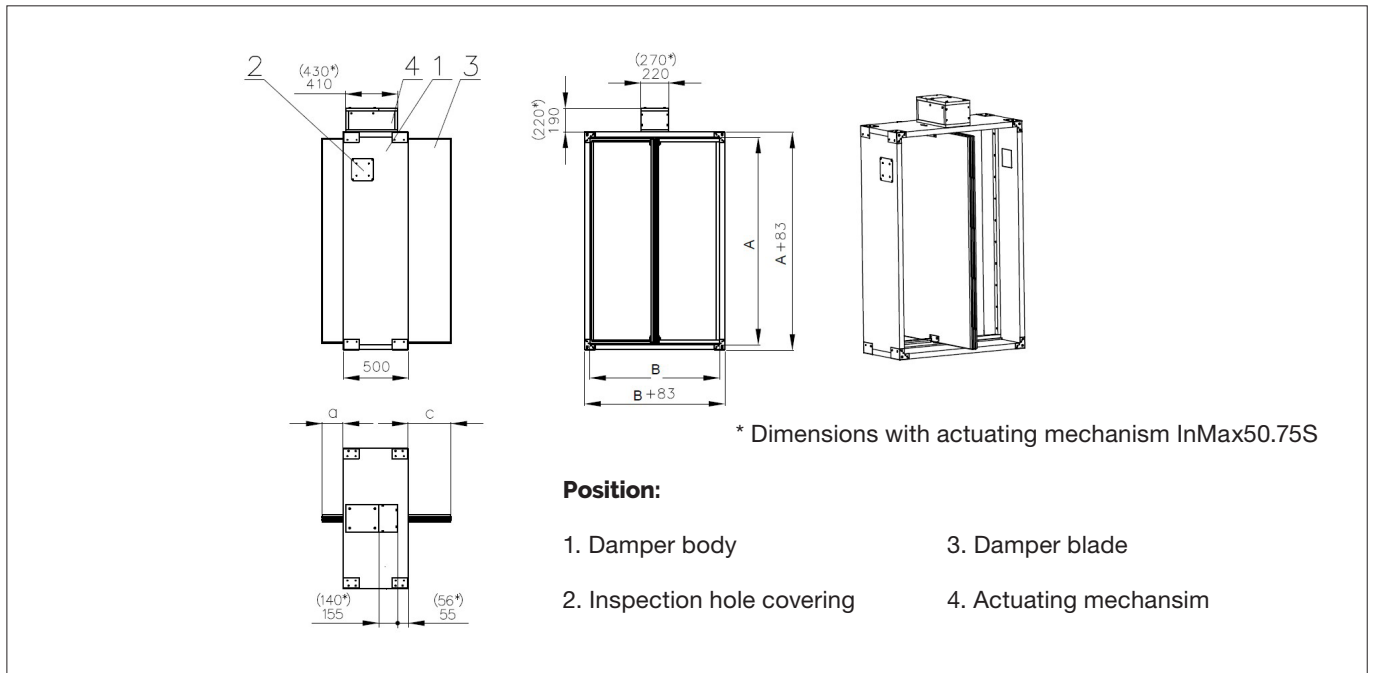
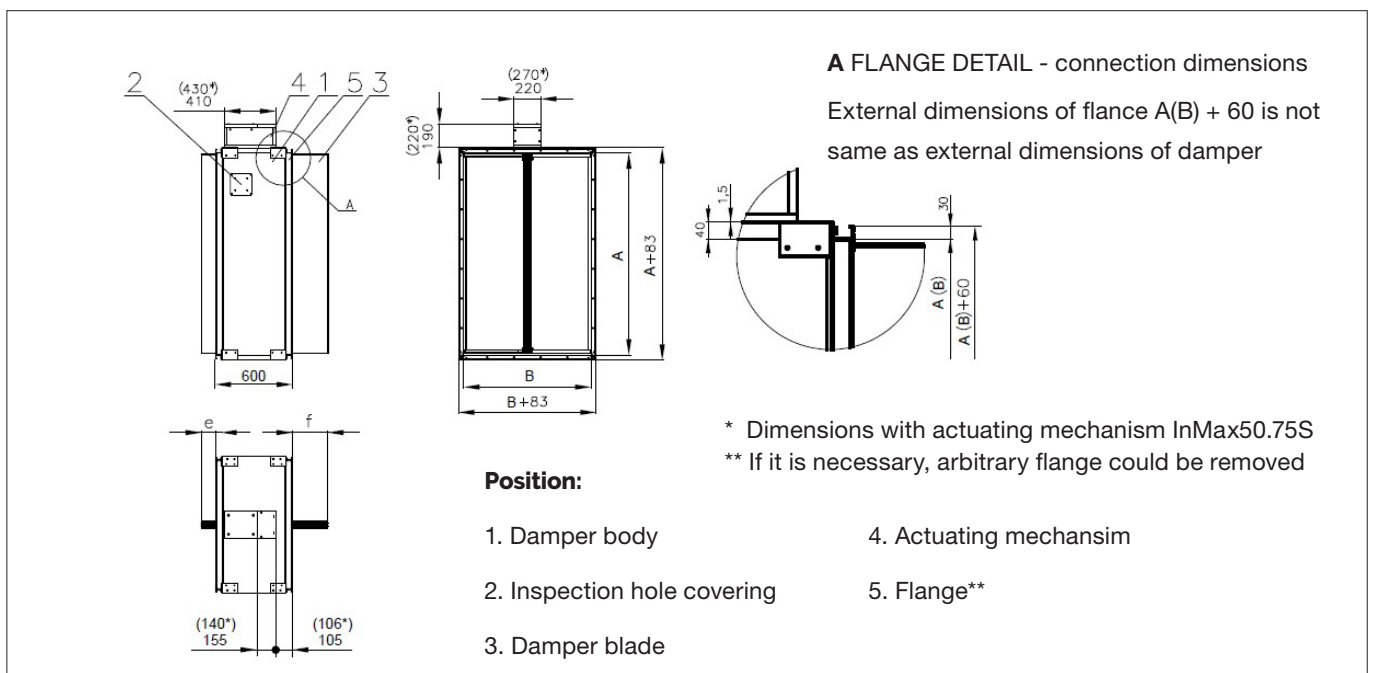


Fig. 15 Smoke control dampers - multi with flanges



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3.2. Weights and effective area

Tab. 3.2.1. Weights and effective area

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
180x180	-	-	-	-	38,3	41,4	0,0077	BELIMO BEN (15Nm)
x200	-	-	-	-	39,6	42,8	0,0099	BELIMO BEN (15Nm)
x225	-	-	-	-	41,2	44,4	0,0127	BELIMO BEN (15Nm)
x250	-	-	-	-	42,8	46,2	0,0154	BELIMO BEN (15Nm)
x280	-	-	-	-	44,6	48,2	0,0187	BELIMO BEN (15Nm)
x300	-	-	-	-	45,9	49,5	0,0209	BELIMO BEN (15Nm)
x315	-	-	-	-	46,8	50,6	0,0226	BELIMO BEN (15Nm)
x355	-	6,5	-	-	49,3	53,3	0,0270	BELIMO BEN (15Nm)
x400	-	29	-	-	52,1	56,4	0,0319	BELIMO BEN (15Nm)
x450	-	54	-	4	55,2	59,8	0,0374	BELIMO BEN (15Nm)
x500	-	79	-	29	58,3	63,2	0,0429	BELIMO BEN (15Nm)
x550	-	104	-	54	61,4	66,6	0,0484	BELIMO BEN (15Nm)
x560	-	109	-	59	62,1	67,2	0,0495	BELIMO BEN (15Nm)
x600	-	129	-	79	64,7	69,9	0,0539	BELIMO BEN (15Nm)
x630	-	144	-	94	66,6	72,1	0,0572	BELIMO BEN (15Nm)
x650	-	154	-	104	67,8	73,4	0,0594	BELIMO BEN (15Nm)
x700	11	179	-	129	70,9	76,8	0,0649	BELIMO BEN (15Nm)
x710	16	184	-	134	71,6	77,5	0,0660	BELIMO BEN (15Nm)
x750	36	204	-	154	74,0	80,2	0,0704	BELIMO BEN (15Nm)
x800	61	229	11	179	77,1	83,6	0,0759	BELIMO BEE (25Nm)
x900	111	279	61	229	83,4	90,5	0,0869	BELIMO BEE (25Nm)
x1000	161	329	111	279	89,6	97,2	0,0979	BELIMO BEE (25Nm)
200x180	-	-	-	-	39,6	42,7	0,0091	BELIMO BEN (15Nm)
x200	-	-	-	-	40,9	44,1	0,0117	BELIMO BEN (15Nm)
x225	-	-	-	-	42,4	45,8	0,0150	BELIMO BEN (15Nm)
x250	-	-	-	-	44,0	47,5	0,0182	BELIMO BEN (15Nm)
x280	-	-	-	-	45,9	49,7	0,0221	BELIMO BEN (15Nm)
x300	-	-	-	-	47,3	51,0	0,0247	BELIMO BEN (15Nm)
x315	-	-	-	-	48,2	52,1	0,0267	BELIMO BEN (15Nm)
x355	-	6,5	-	-	50,8	54,8	0,0319	BELIMO BEN (15Nm)
x400	-	29	-	-	53,6	58,1	0,0377	BELIMO BEN (15Nm)
x450	-	54	-	4	56,8	61,4	0,0442	BELIMO BEN (15Nm)
x500	-	79	-	29	60,1	64,9	0,0507	BELIMO BEN (15Nm)
x550	-	104	-	54	63,2	68,4	0,0572	BELIMO BEN (15Nm)
x560	-	109	-	59	63,9	69,1	0,0585	BELIMO BEN (15Nm)
x600	-	129	-	79	66,4	72,0	0,0637	BELIMO BEN (15Nm)
x630	-	144	-	94	68,3	74,0	0,0676	BELIMO BEN (15Nm)
x650	-	154	-	104	69,7	75,3	0,0702	BELIMO BEN (15Nm)

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Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
200x700	11	179	-	129	72,8	78,8	0,0767	BELIMO BEN (15Nm)
x710	16	184	-	134	73,4	79,5	0,0780	BELIMO BEN (15Nm)
x750	36	204	-	154	76,0	82,4	0,0832	BELIMO BEN (15Nm)
x800	61	229	11	179	79,2	85,9	0,0897	BELIMO BEE (25Nm)
x900	111	279	61	229	85,6	92,7	0,1027	BELIMO BEE (25Nm)
x1000	161	329	111	279	91,9	99,8	0,1157	BELIMO BEE (25Nm)
225x180	-	-	-	-	41,0	44,4	0,0109	BELIMO BEN (15Nm)
x200	-	-	-	-	42,4	45,8	0,0140	BELIMO BEN (15Nm)
x225	-	-	-	-	44,0	47,5	0,0178	BELIMO BEN (15Nm)
x250	-	-	-	-	45,6	49,3	0,0217	BELIMO BEN (15Nm)
x280	-	-	-	-	47,7	51,4	0,0264	BELIMO BEN (15Nm)
x300	-	-	-	-	49,0	52,9	0,0295	BELIMO BEN (15Nm)
x315	-	-	-	-	50,0	54,0	0,0318	BELIMO BEN (15Nm)
x355	-	6,5	-	-	52,5	56,8	0,0380	BELIMO BEN (15Nm)
x400	-	29	-	-	55,5	60,1	0,0450	BELIMO BEN (15Nm)
x450	-	54	-	4	58,9	63,6	0,0527	BELIMO BEN (15Nm)
x500	-	79	-	29	62,1	67,2	0,0605	BELIMO BEN (15Nm)
x550	-	104	-	54	65,3	70,7	0,0682	BELIMO BEN (15Nm)
x560	-	109	-	59	66,0	71,4	0,0698	BELIMO BEN (15Nm)
x600	-	129	-	79	68,7	74,3	0,0760	BELIMO BEN (15Nm)
x630	-	144	-	94	70,6	76,4	0,0806	BELIMO BEN (15Nm)
x650	-	154	-	104	72,0	77,9	0,0837	BELIMO BEN (15Nm)
x700	11	179	-	129	75,2	81,4	0,0915	BELIMO BEN (15Nm)
x710	16	184	-	134	75,9	82,1	0,0930	BELIMO BEN (15Nm)
x750	36	204	-	154	78,6	85,1	0,0992	BELIMO BEN (15Nm)
x800	61	229	11	179	81,8	88,6	0,1070	BELIMO BEE (25Nm)
x900	111	279	61	229	88,4	95,7	0,1225	BELIMO BEE (25Nm)
x1000	161	329	111	279	94,9	102,9	0,1380	BELIMO BEE (25Nm)
250x180	-	-	-	-	42,5	46,0	0,0126	BELIMO BEN (15Nm)
x200	-	-	-	-	43,9	47,5	0,0162	BELIMO BEN (15Nm)
x225	-	-	-	-	45,6	49,3	0,0207	BELIMO BEN (15Nm)
x250	-	-	-	-	47,3	51,2	0,0252	BELIMO BEN (15Nm)
x280	-	-	-	-	49,3	53,3	0,0306	BELIMO BEN (15Nm)
x300	-	-	-	-	50,6	54,8	0,0342	BELIMO BEN (15Nm)
x315	-	-	-	-	51,7	55,9	0,0369	BELIMO BEN (15Nm)
x355	-	6,5	-	-	54,4	58,7	0,0441	BELIMO BEN (15Nm)
x400	-	29	-	-	57,4	62,1	0,0522	BELIMO BEN (15Nm)
x450	-	54	-	4	60,8	65,7	0,0612	BELIMO BEN (15Nm)
x500	-	79	-	29	64,1	69,4	0,0702	BELIMO BEN (15Nm)
x550	-	104	-	54	67,5	73,0	0,0792	BELIMO BEN (15Nm)
x560	-	109	-	59	68,2	73,7	0,0810	BELIMO BEN (15Nm)
x600	-	129	-	79	70,9	76,7	0,0882	BELIMO BEN (15Nm)
x630	-	144	-	94	72,9	78,8	0,0936	BELIMO BEN (15Nm)

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Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
250x650	-	154	-	104	74,3	80,3	0,0972	BELIMO BEN (15Nm)
x700	11	179	-	129	77,6	84,0	0,1062	BELIMO BEN (15Nm)
x710	16	184	-	134	78,3	84,8	0,1080	BELIMO BEN (15Nm)
x750	36	204	-	154	81,0	87,6	0,1152	BELIMO BEN (15Nm)
x800	61	229	11	179	84,4	91,3	0,1242	BELIMO BEE (25Nm)
x900	111	279	61	229	91,1	98,6	0,1422	BELIMO BEE (25Nm)
x1000	161	329	111	279	97,9	105,8	0,1602	BELIMO BEE (25Nm)
280x180	-	-	-	-	42,8	46,2	0,0147	BELIMO BEN (15Nm)
x200	-	-	-	-	44,1	47,7	0,0189	BELIMO BEN (15Nm)
x225	-	-	-	-	45,8	49,4	0,0242	BELIMO BEN (15Nm)
x250	-	-	-	-	47,5	51,2	0,0294	BELIMO BEN (15Nm)
x280	-	-	-	-	49,4	53,4	0,0357	BELIMO BEN (15Nm)
x300	-	-	-	-	50,8	54,9	0,0399	BELIMO BEN (15Nm)
x315	-	-	-	-	51,7	56,0	0,0431	BELIMO BEN (15Nm)
x355	-	6,5	-	-	54,5	58,9	0,0515	BELIMO BEN (15Nm)
x400	-	29	-	-	57,5	62,1	0,0609	BELIMO BEN (15Nm)
x450	-	54	-	4	60,8	65,8	0,0714	BELIMO BEN (15Nm)
x500	-	79	-	29	64,2	69,4	0,0819	BELIMO BEN (15Nm)
x550	-	104	-	54	67,5	72,9	0,0924	BELIMO BEN (15Nm)
x560	-	109	-	59	68,3	73,7	0,0945	BELIMO BEN (15Nm)
x600	-	129	-	79	70,9	76,6	0,1029	BELIMO BEN (15Nm)
x630	-	144	-	94	72,9	78,8	0,1092	BELIMO BEN (15Nm)
x650	-	154	-	104	74,2	80,2	0,1134	BELIMO BEN (15Nm)
x700	11	179	-	129	77,6	83,9	0,1239	BELIMO BEN (15Nm)
x710	16	184	-	134	78,3	84,6	0,1260	BELIMO BEN (15Nm)
x750	36	204	-	154	80,9	87,5	0,1344	BELIMO BEN (15Nm)
x800	61	229	11	179	84,2	91,1	0,1449	BELIMO BEE (25Nm)
x900	111	279	61	229	91,0	98,3	0,1659	BELIMO BEE (25Nm)
x1000	161	329	111	279	97,6	105,6	0,1869	BELIMO BEE (25Nm)
300x180	-	-	-	-	43,9	47,5	0,0161	BELIMO BEN (15Nm)
x200	-	-	-	-	45,2	49,0	0,0207	BELIMO BEN (15Nm)
x225	-	-	-	-	46,9	50,8	0,0265	BELIMO BEN (15Nm)
x250	-	-	-	-	48,8	52,7	0,0322	BELIMO BEN (15Nm)
x280	-	-	-	-	50,7	54,9	0,0391	BELIMO BEN (15Nm)
x300	-	-	-	-	52,1	56,3	0,0437	BELIMO BEN (15Nm)
x315	-	-	-	-	53,2	57,5	0,0472	BELIMO BEN (15Nm)
x355	-	6,5	-	-	55,9	60,3	0,0564	BELIMO BEN (15Nm)
x400	-	29	-	-	58,9	63,7	0,0667	BELIMO BEN (15Nm)
x450	-	54	-	4	62,4	67,3	0,0782	BELIMO BEN (15Nm)
x500	-	79	-	29	65,8	71,1	0,0897	BELIMO BEN (15Nm)
x550	-	104	-	54	69,2	74,8	0,1012	BELIMO BEN (15Nm)
x560	-	109	-	59	69,8	75,5	0,1035	BELIMO BEN (15Nm)
x600	-	129	-	79	72,5	78,4	0,1127	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
300x630	-	144	-	94	74,6	80,6	0,1196	BELIMO BEN (15Nm)
x650	-	154	-	104	76,1	82,2	0,1242	BELIMO BEN (15Nm)
x700	11	179	-	129	79,4	85,8	0,1357	BELIMO BEN (15Nm)
x710	16	184	-	134	80,1	86,6	0,1380	BELIMO BEN (15Nm)
x750	36	204	-	154	82,8	89,4	0,1472	BELIMO BEN (15Nm)
x800	61	229	11	179	86,3	93,2	0,1587	BELIMO BEE (25Nm)
x900	111	279	61	229	93,1	100,6	0,1817	BELIMO BEE (25Nm)
x1000	161	329	111	279	100,0	107,9	0,2047	BELIMO BEE (25Nm)
315x180	-	-	-	-	44,7	48,5	0,0172	BELIMO BEN (15Nm)
x200	-	-	-	-	46,2	49,9	0,0221	BELIMO BEN (15Nm)
x225	-	-	-	-	47,8	51,7	0,0282	BELIMO BEN (15Nm)
x250	-	-	-	-	49,7	53,7	0,0343	BELIMO BEN (15Nm)
x280	-	-	-	-	51,7	55,9	0,0417	BELIMO BEN (15Nm)
x300	-	-	-	-	53,0	57,5	0,0466	BELIMO BEN (15Nm)
x315	-	-	-	-	54,1	58,5	0,0502	BELIMO BEN (15Nm)
x355	-	6,5	-	-	56,9	61,5	0,0600	BELIMO BEN (15Nm)
x400	-	29	-	-	60,1	64,9	0,0711	BELIMO BEN (15Nm)
x450	-	54	-	4	63,4	68,6	0,0833	BELIMO BEN (15Nm)
x500	-	79	-	29	67,0	72,4	0,0956	BELIMO BEN (15Nm)
x550	-	104	-	54	70,5	76,1	0,1078	BELIMO BEN (15Nm)
x560	-	109	-	59	71,1	76,8	0,1103	BELIMO BEN (15Nm)
x600	-	129	-	79	73,8	79,8	0,1201	BELIMO BEN (15Nm)
x630	-	144	-	94	75,9	82,0	0,1274	BELIMO BEN (15Nm)
x650	-	154	-	104	77,4	83,6	0,1323	BELIMO BEN (15Nm)
x700	11	179	-	129	80,9	87,4	0,1446	BELIMO BEN (15Nm)
x710	16	184	-	134	81,5	88,0	0,1470	BELIMO BEN (15Nm)
x750	36	204	-	154	84,2	91,0	0,1568	BELIMO BEN (15Nm)
x800	61	229	11	179	87,8	94,8	0,1691	BELIMO BEE (25Nm)
x900	111	279	61	229	94,6	102,3	0,1936	BELIMO BEE (25Nm)
x1000	161	329	111	279	101,7	109,7	0,2181	BELIMO BEE (25Nm)
355x180	-	-	-	-	46,3	50,2	0,0200	BELIMO BEN (15Nm)
x200	-	-	-	-	47,7	51,7	0,0257	BELIMO BEN (15Nm)
x225	-	-	-	-	49,5	53,6	0,0328	BELIMO BEN (15Nm)
x250	-	-	-	-	51,3	55,6	0,0399	BELIMO BEN (15Nm)
x280	-	-	-	-	53,5	57,9	0,0485	BELIMO BEN (15Nm)
x300	-	-	-	-	54,9	59,4	0,0542	BELIMO BEN (15Nm)
x315	-	-	-	-	55,9	60,5	0,0584	BELIMO BEN (15Nm)
x355	-	6,5	-	-	58,8	63,5	0,0698	BELIMO BEN (15Nm)
x400	-	29	-	-	62,0	66,9	0,0827	BELIMO BEN (15Nm)
x450	-	54	-	4	65,5	70,8	0,0969	BELIMO BEN (15Nm)
x500	-	79	-	29	69,1	74,6	0,1112	BELIMO BEN (15Nm)
x550	-	104	-	54	72,6	78,5	0,1254	BELIMO BEN (15Nm)
x560	-	109	-	59	73,3	79,2	0,1283	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
355x600	-	129	-	79	76,2	82,2	0,1397	BELIMO BEN (15Nm)
x630	-	144	-	94	78,3	84,5	0,1482	BELIMO BEN (15Nm)
x650	-	154	-	104	79,7	86,0	0,1539	BELIMO BEN (15Nm)
x700	11	179	-	129	83,3	89,9	0,1682	BELIMO BEN (15Nm)
x710	16	184	-	134	84,0	90,6	0,1710	BELIMO BEN (15Nm)
x750	36	204	-	154	86,8	93,7	0,1824	BELIMO BEN (15Nm)
x800	61	229	11	179	90,4	97,5	0,1967	BELIMO BEE (25Nm)
x900	111	279	61	229	97,4	105,1	0,2252	BELIMO BEE (25Nm)
x1000	161	329	111	279	104,6	112,8	0,2537	BELIMO BEE (25Nm)
400x180	-	-	-	-	49,7	53,8	0,0231	BELIMO BEN (15Nm)
x200	-	-	-	-	51,2	55,5	0,0297	BELIMO BEN (15Nm)
x225	-	-	-	-	53,0	57,5	0,0380	BELIMO BEN (15Nm)
x250	-	-	-	-	55,0	59,5	0,0462	BELIMO BEN (15Nm)
x280	-	-	-	-	57,2	61,9	0,0561	BELIMO BEN (15Nm)
x300	-	-	-	-	58,8	63,4	0,0627	BELIMO BEN (15Nm)
x315	-	-	-	-	59,8	64,7	0,0677	BELIMO BEN (15Nm)
x355	-	6,5	-	-	62,9	68,0	0,0809	BELIMO BEN (15Nm)
x400	-	29	-	-	66,2	71,5	0,0957	BELIMO BEN (15Nm)
x450	-	54	-	4	69,9	75,5	0,1122	BELIMO BEN (15Nm)
x500	-	79	-	29	73,7	79,6	0,1287	BELIMO BEN (15Nm)
x550	-	104	-	54	77,5	83,6	0,1452	BELIMO BEN (15Nm)
x560	-	109	-	59	78,3	84,4	0,1485	BELIMO BEN (15Nm)
x600	-	129	-	79	81,3	87,6	0,1617	BELIMO BEN (15Nm)
x630	-	144	-	94	83,5	90,1	0,1716	BELIMO BEN (15Nm)
x650	-	154	-	104	85,0	91,7	0,1782	BELIMO BEN (15Nm)
x700	11	179	-	129	88,8	95,7	0,1947	BELIMO BEN (15Nm)
x710	16	184	-	134	89,6	96,5	0,1980	BELIMO BEN (15Nm)
x750	36	204	-	154	92,6	99,7	0,2112	BELIMO BEN (15Nm)
x800	61	229	11	179	96,3	103,7	0,2277	BELIMO BEE (25Nm)
x900	111	279	61	229	103,7	111,8	0,2607	BELIMO BEE (25Nm)
x1000	161	329	111	279	111,3	119,9	0,2937	BELIMO BEE (25Nm)
450x180	-	-	-	-	52,7	57,1	0,0266	BELIMO BEN (15Nm)
x200	-	-	-	-	54,2	58,8	0,0342	BELIMO BEN (15Nm)
x225	-	-	-	-	56,2	60,8	0,0437	BELIMO BEN (15Nm)
x250	-	-	-	-	58,1	62,9	0,0532	BELIMO BEN (15Nm)
x280	-	-	-	-	60,5	65,4	0,0646	BELIMO BEN (15Nm)
x300	-	-	-	-	62,0	67,1	0,0722	BELIMO BEN (15Nm)
x315	-	-	-	-	63,2	68,4	0,0779	BELIMO BEN (15Nm)
x355	-	6,5	-	-	66,3	71,8	0,0931	BELIMO BEN (15Nm)
x400	-	29	-	-	69,9	75,5	0,1102	BELIMO BEN (15Nm)
x450	-	54	-	4	73,8	79,7	0,1292	BELIMO BEN (15Nm)
x500	-	79	-	29	77,7	83,9	0,1482	BELIMO BEN (15Nm)
x550	-	104	-	54	81,6	88,0	0,1672	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
450x560	-	109	-	59	82,4	88,9	0,1710	BELIMO BEN (15Nm)
x600	-	129	-	79	85,5	92,3	0,1862	BELIMO BEN (15Nm)
x630	-	144	-	94	87,9	94,8	0,1976	BELIMO BEN (15Nm)
x650	-	154	-	104	89,4	96,5	0,2052	BELIMO BEN (15Nm)
x700	11	179	-	129	93,5	100,6	0,2242	BELIMO BEN (15Nm)
x710	16	184	-	134	94,3	101,5	0,2280	BELIMO BEN (15Nm)
x750	36	204	-	154	97,4	104,8	0,2432	BELIMO BEN (15Nm)
x800	61	229	11	179	101,3	109,1	0,2622	BELIMO BEE (25Nm)
x900	111	279	61	229	109,1	117,4	0,3002	BELIMO BEE (25Nm)
x1000	161	329	111	279	118,3	127,1	0,3382	BELIMO BEE (25Nm)
500x180	-	-	-	-	53,4	56,9	0,0301	BELIMO BEN (15Nm)
x200	-	-	-	-	55,0	58,7	0,0387	BELIMO BEN (15Nm)
x225	-	-	-	-	56,9	60,6	0,0495	BELIMO BEN (15Nm)
x250	-	-	-	-	58,9	62,7	0,0602	BELIMO BEN (15Nm)
x280	-	-	-	-	61,3	65,2	0,0731	BELIMO BEN (15Nm)
x300	-	-	-	-	62,9	66,9	0,0817	BELIMO BEN (15Nm)
x315	-	-	-	-	64,0	68,1	0,0882	BELIMO BEN (15Nm)
x355	-	6,5	-	-	67,1	71,5	0,1054	BELIMO BEN (15Nm)
x400	-	29	-	-	70,8	75,2	0,1247	BELIMO BEN (15Nm)
x450	-	54	-	4	74,6	79,2	0,1462	BELIMO BEN (15Nm)
x500	-	79	-	29	78,6	83,4	0,1677	BELIMO BEN (15Nm)
x550	-	104	-	54	82,5	87,5	0,1892	BELIMO BEN (15Nm)
x560	-	109	-	59	83,3	88,3	0,1935	BELIMO BEN (15Nm)
x600	-	129	-	79	86,5	91,6	0,2107	BELIMO BEN (15Nm)
x630	-	144	-	94	88,8	94,1	0,2236	BELIMO BEN (15Nm)
x650	-	154	-	104	90,4	95,8	0,2322	BELIMO BEN (15Nm)
x700	11	179	-	129	94,4	99,9	0,2537	BELIMO BEN (15Nm)
x710	16	184	-	134	95,1	100,7	0,2580	BELIMO BEN (15Nm)
x750	36	204	-	154	98,3	104,1	0,2752	BELIMO BEN (15Nm)
x800	61	229	11	179	102,3	108,1	0,2967	BELIMO BEE (25Nm)
x900	111	279	61	229	110,0	116,4	0,3397	BELIMO BEE (25Nm)
x1000	161	329	111	279	119,3	126	0,3827	BELIMO BEE (25Nm)
550x180	-	-	-	-	56,1	61,0	0,0336	BELIMO BEN (15Nm)
x200	-	-	-	-	57,9	62,8	0,0432	BELIMO BEN (15Nm)
x225	-	-	-	-	59,9	64,9	0,0552	BELIMO BEN (15Nm)
x250	-	-	-	-	61,9	67,0	0,0672	BELIMO BEN (15Nm)
x280	-	-	-	-	64,4	69,6	0,0816	BELIMO BEN (15Nm)
x300	-	-	-	-	66,0	71,4	0,0912	BELIMO BEN (15Nm)
x315	-	-	-	-	67,3	72,8	0,0984	BELIMO BEN (15Nm)
x355	-	6,5	-	-	70,5	76,3	0,1176	BELIMO BEN (15Nm)
x400	-	29	-	-	74,3	80,1	0,1392	BELIMO BEN (15Nm)
x450	-	54	-	4	78,3	84,5	0,1632	BELIMO BEN (15Nm)
x500	-	79	-	29	82,4	88,9	0,1872	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
550x550	-	104	-	54	86,5	93,3	0,2112	BELIMO BEN (15Nm)
x560	-	109	-	59	87,4	94,1	0,2160	BELIMO BEN (15Nm)
x600	-	129	-	79	90,6	97,5	0,2352	BELIMO BEN (15Nm)
x630	-	144	-	94	93,1	100,1	0,2496	BELIMO BEN (15Nm)
x650	-	154	-	104	94,8	101,9	0,2592	BELIMO BEN (15Nm)
x700	11	179	-	129	98,8	106,3	0,2832	BELIMO BEN (15Nm)
x710	16	184	-	134	99,6	107,1	0,2880	BELIMO BEN (15Nm)
x750	36	204	-	154	102,9	110,6	0,3072	BELIMO BEE (25Nm)
x800	61	229	11	179	107,0	115,0	0,3312	BELIMO BEE (25Nm)
x900	111	279	61	229	116,5	125,0	0,3792	BELIMO BEE (25Nm)
x1000	161	329	111	279	124,6	133,6	0,4272	BELIMO BE (40Nm)
560x180	-	-	-	-	56,8	61,5	0,0343	BELIMO BEN (15Nm)
x200	-	-	-	-	58,4	63,4	0,0441	BELIMO BEN (15Nm)
x225	-	-	-	-	60,5	65,5	0,0564	BELIMO BEN (15Nm)
x250	-	-	-	-	62,5	67,8	0,0686	BELIMO BEN (15Nm)
x280	-	-	-	-	65,0	70,4	0,0833	BELIMO BEN (15Nm)
x300	-	-	-	-	66,6	72,1	0,0931	BELIMO BEN (15Nm)
x315	-	-	-	-	67,9	73,4	0,1005	BELIMO BEN (15Nm)
x355	-	6,5	-	-	71,3	76,9	0,1201	BELIMO BEN (15Nm)
x400	-	29	-	-	74,9	80,9	0,1421	BELIMO BEN (15Nm)
x450	-	54	-	4	79,0	85,3	0,1666	BELIMO BEN (15Nm)
x500	-	79	-	29	83,1	89,6	0,1911	BELIMO BEN (15Nm)
x550	-	104	-	54	87,3	94,0	0,2156	BELIMO BEN (15Nm)
x560	-	109	-	59	88,1	94,9	0,2205	BELIMO BEN (15Nm)
x600	-	129	-	79	91,5	98,4	0,2401	BELIMO BEN (15Nm)
x630	-	144	-	94	93,9	101,1	0,2548	BELIMO BEN (15Nm)
x650	-	154	-	104	95,6	102,9	0,2646	BELIMO BEN (15Nm)
x700	11	179	-	129	99,8	107,3	0,2891	BELIMO BEN (15Nm)
x710	16	184	-	134	100,5	108,1	0,2940	BELIMO BEN (15Nm)
x750	36	204	-	154	103,9	111,6	0,3136	BELIMO BEE (25Nm)
x800	61	229	11	179	108,0	116,0	0,3381	BELIMO BEE (25Nm)
x900	111	279	61	229	117,5	126,0	0,3871	BELIMO BEE (25Nm)
x1000	161	329	111	279	125,8	134,9	0,4361	BELIMO BE (40Nm)
600x180	-	-	-	-	59,0	64,0	0,0371	BELIMO BEN (15Nm)
x200	-	-	-	-	60,6	65,9	0,0477	BELIMO BEN (15Nm)
x225	-	-	-	-	62,8	68,1	0,0610	BELIMO BEN (15Nm)
x250	-	-	-	-	65,0	70,4	0,0742	BELIMO BEN (15Nm)
x280	-	-	-	-	67,5	73,0	0,0901	BELIMO BEN (15Nm)
x300	-	-	-	-	69,3	74,9	0,1007	BELIMO BEN (15Nm)
x315	-	-	-	-	70,5	76,3	0,1087	BELIMO BEN (15Nm)
x355	-	6,5	-	-	73,9	79,9	0,1299	BELIMO BEN (15Nm)
x400	-	29	-	-	77,8	83,9	0,1537	BELIMO BEN (15Nm)
x450	-	54	-	4	82,0	88,4	0,1802	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
600x500	-	79	-	29	86,3	92,9	0,2067	BELIMO BEN (15Nm)
x550	-	104	-	54	90,5	97,5	0,2332	BELIMO BEN (15Nm)
x560	-	109	-	59	91,4	98,4	0,2385	BELIMO BEN (15Nm)
x600	-	129	-	79	94,8	102,0	0,2597	BELIMO BEN (15Nm)
x630	-	144	-	94	97,4	104,8	0,2756	BELIMO BEN (15Nm)
x650	-	154	-	104	99,0	106,5	0,2862	BELIMO BEN (15Nm)
x700	11	179	-	129	103,3	111,0	0,3127	BELIMO BEN (15Nm)
x710	16	184	-	134	104,1	111,9	0,3180	BELIMO BEN (15Nm)
x750	36	204	-	154	107,5	115,5	0,3392	BELIMO BEE (25Nm)
x800	61	229	11	179	111,8	120,0	0,3657	BELIMO BEE (25Nm)
x900	111	279	61	229	121,6	130,4	0,4187	BELIMO BEE (25Nm)
x1000	161	329	111	279	130,1	139,4	0,4717	BELIMO BE (40Nm)
630x180	-	-	-	-	60,6	65,9	0,0392	BELIMO BEN (15Nm)
x200	-	-	-	-	62,4	67,6	0,0504	BELIMO BEN (15Nm)
x225	-	-	-	-	64,6	70,0	0,0644	BELIMO BEN (15Nm)
x250	-	-	-	-	66,8	72,3	0,0784	BELIMO BEN (15Nm)
x280	-	-	-	-	69,4	75,1	0,0952	BELIMO BEN (15Nm)
x300	-	-	-	-	71,1	76,9	0,1064	BELIMO BEN (15Nm)
x315	-	-	-	-	72,4	78,3	0,1148	BELIMO BEN (15Nm)
x355	-	6,5	-	-	75,9	82,0	0,1372	BELIMO BEN (15Nm)
x400	-	29	-	-	79,9	86,1	0,1624	BELIMO BEN (15Nm)
x450	-	54	-	4	84,1	90,8	0,1904	BELIMO BEN (15Nm)
x500	-	79	-	29	88,5	95,4	0,2184	BELIMO BEN (15Nm)
x550	-	104	-	54	92,9	100,0	0,2464	BELIMO BEN (15Nm)
x560	-	109	-	59	93,8	100,9	0,2520	BELIMO BEN (15Nm)
x600	-	129	-	79	97,3	104,6	0,2744	BELIMO BEN (15Nm)
x630	-	144	-	94	99,9	107,4	0,2912	BELIMO BEN (15Nm)
x650	-	154	-	104	101,6	109,3	0,3024	BELIMO BEN (15Nm)
x700	11	179	-	129	106,0	113,9	0,3304	BELIMO BEN (15Nm)
x710	16	184	-	134	106,9	114,8	0,3360	BELIMO BEN (15Nm)
x750	36	204	-	154	110,4	118,5	0,3584	BELIMO BEE (25Nm)
x800	61	229	11	179	114,8	123,1	0,3864	BELIMO BEE (25Nm)
x900	111	279	61	229	124,6	133,6	0,4424	BELIMO BEE (25Nm)
x1000	161	329	111	279	133,4	142,9	0,4984	BELIMO BE (40Nm)
650x180	-	-	-	-	61,8	67,1	0,0406	BELIMO BEN (15Nm)
x200	-	-	-	-	63,5	68,9	0,0522	BELIMO BEN (15Nm)
x225	-	-	-	-	65,8	71,3	0,0667	BELIMO BEN (15Nm)
x250	-	-	-	-	68,0	73,6	0,0812	BELIMO BEN (15Nm)
x280	-	-	-	-	70,6	76,4	0,0986	BELIMO BEN (15Nm)
x300	-	-	-	-	72,4	78,3	0,1102	BELIMO BEN (15Nm)
x315	-	-	-	-	73,8	79,8	0,1189	BELIMO BEN (15Nm)
x355	-	6,5	-	-	77,3	83,5	0,1421	BELIMO BEN (15Nm)
x400	-	29	-	-	81,3	87,6	0,1682	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
650x450	-	54	-	4	85,6	92,4	0,1972	BELIMO BEN (15Nm)
x500	-	79	-	29	90,1	97,0	0,2262	BELIMO BEN (15Nm)
x550	-	104	-	54	94,5	101,8	0,2552	BELIMO BEN (15Nm)
x560	-	109	-	59	95,4	102,6	0,2610	BELIMO BEN (15Nm)
x600	-	129	-	79	98,9	106,4	0,2842	BELIMO BEN (15Nm)
x630	-	144	-	94	101,6	109,3	0,3016	BELIMO BEN (15Nm)
x650	-	154	-	104	103,4	111,1	0,3132	BELIMO BEN (15Nm)
x700	11	179	-	129	107,8	115,8	0,3422	BELIMO BEN (15Nm)
x710	16	184	-	134	108,6	116,8	0,3480	BELIMO BEN (15Nm)
x750	36	204	-	154	112,3	120,5	0,3712	BELIMO BEE (25Nm)
x800	61	229	11	179	117,9	126,4	0,4002	BELIMO BEE (25Nm)
x900	111	279	61	229	126,8	135,8	0,4582	BELIMO BE (40Nm)
x1000	161	329	111	279	135,6	145,1	0,5162	BELIMO BE (40Nm)
700x180	-	-	-	-	64,5	66,2	0,0441	BELIMO BEN (15Nm)
x200	-	-	-	-	66,4	68,0	0,0567	BELIMO BEN (15Nm)
x225	-	-	-	-	68,8	70,3	0,0725	BELIMO BEN (15Nm)
x250	-	-	-	-	71,0	72,6	0,0882	BELIMO BEN (15Nm)
x280	-	-	-	-	73,8	75,4	0,1071	BELIMO BEN (15Nm)
x300	-	-	-	-	75,6	77,2	0,1197	BELIMO BEN (15Nm)
x315	-	-	-	-	77,0	78,6	0,1292	BELIMO BEN (15Nm)
x355	-	6,5	-	-	80,6	82,2	0,1544	BELIMO BEN (15Nm)
x400	-	29	-	-	84,8	86,4	0,1827	BELIMO BEN (15Nm)
x450	-	54	-	4	89,4	90,9	0,2142	BELIMO BEN (15Nm)
x500	-	79	-	29	93,9	95,5	0,2457	BELIMO BEN (15Nm)
x550	-	104	-	54	98,5	100,1	0,2772	BELIMO BEN (15Nm)
x560	-	109	-	59	99,4	101,0	0,2835	BELIMO BEN (15Nm)
x600	-	129	-	79	103,1	104,7	0,3087	BELIMO BEN (15Nm)
x630	-	144	-	94	105,9	107,4	0,3276	BELIMO BEE (25Nm)
x650	-	154	-	104	107,6	109,2	0,3402	BELIMO BEE (25Nm)
x700	11	179	-	129	112,3	113,8	0,3717	BELIMO BEE (25Nm)
x710	16	184	-	134	113,1	114,7	0,3780	BELIMO BEE (25Nm)
x750	36	204	-	154	116,9	118,4	0,4032	BELIMO BEE (25Nm)
x800	61	229	11	179	122,8	124,1	0,4347	BELIMO BEE (25Nm)
x900	111	279	61	229	131,9	133,2	0,4977	BELIMO BE (40Nm)
x1000	161	329	111	279	141,0	142,4	0,5607	BELIMO BE (40Nm)
710x180	-	-	-	-	63,6	69,1	0,0448	BELIMO BEN (15Nm)
x200	-	-	-	-	65,4	70,9	0,0576	BELIMO BEN (15Nm)
x225	-	-	-	-	67,6	73,3	0,0736	BELIMO BEN (15Nm)
x250	-	-	-	-	69,9	75,8	0,0896	BELIMO BEN (15Nm)
x280	-	-	-	-	72,6	78,6	0,1088	BELIMO BEN (15Nm)
x300	-	-	-	-	74,4	80,5	0,1216	BELIMO BEN (15Nm)
x315	-	-	-	-	75,8	81,9	0,1312	BELIMO BEN (15Nm)
x355	-	6,5	-	-	79,3	85,6	0,1568	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
710x400	-	29	-	-	83,4	90,0	0,1856	BELIMO BEN (15Nm)
x450	-	54	-	4	87,8	94,8	0,2176	BELIMO BEN (15Nm)
x500	-	79	-	29	92,4	99,6	0,2496	BELIMO BEN (15Nm)
x550	-	104	-	54	96,9	104,3	0,2816	BELIMO BEN (15Nm)
x560	-	109	-	59	97,8	105,2	0,2880	BELIMO BEN (15Nm)
x600	-	129	-	79	101,4	109,1	0,3136	BELIMO BEN (15Nm)
x630	-	144	-	94	102,4	111,9	0,3328	BELIMO BEE (25Nm)
x650	-	154	-	104	104,2	113,8	0,3456	BELIMO BEE (25Nm)
x700	11	179	-	129	108,6	118,6	0,3776	BELIMO BEE (25Nm)
x710	16	184	-	134	109,6	119,6	0,3840	BELIMO BEE (25Nm)
x750	36	204	-	154	113,0	123,3	0,4096	BELIMO BEE (25Nm)
x800	61	229	11	179	118,7	129,3	0,4416	BELIMO BEE (25Nm)
x900	111	279	61	229	127,6	138,8	0,5056	BELIMO BE (40Nm)
x1000	161	329	111	279	136,4	148,4	0,5696	BELIMO BE (40Nm)
750x180	-	-	-	-	64,7	70,2	0,0476	BELIMO BEN (15Nm)
x200	-	-	-	-	66,5	72,1	0,0612	BELIMO BEN (15Nm)
x225	-	-	-	-	68,8	74,6	0,0782	BELIMO BEN (15Nm)
x250	-	-	-	-	71,0	77,0	0,0952	BELIMO BEN (15Nm)
x280	-	-	-	-	73,8	79,9	0,1156	BELIMO BEN (15Nm)
x300	-	-	-	-	75,6	81,8	0,1292	BELIMO BEN (15Nm)
x315	-	-	-	-	76,9	83,3	0,1394	BELIMO BEN (15Nm)
x355	-	6,5	-	-	80,6	87,1	0,1666	BELIMO BEN (15Nm)
x400	-	29	-	-	84,7	91,4	0,1972	BELIMO BEN (15Nm)
x450	-	54	-	4	89,3	96,2	0,2312	BELIMO BEN (15Nm)
x500	-	79	-	29	93,8	101,0	0,2652	BELIMO BEN (15Nm)
x550	-	104	-	54	98,4	105,8	0,2992	BELIMO BEN (15Nm)
x560	-	109	-	59	99,4	106,8	0,3060	BELIMO BEN (15Nm)
x600	-	129	-	79	103,0	110,6	0,3332	BELIMO BEN (15Nm)
x630	-	144	-	94	105,7	113,5	0,3536	BELIMO BEE (25Nm)
x650	-	154	-	104	107,5	115,4	0,3672	BELIMO BEE (25Nm)
x700	11	179	-	129	112,1	120,2	0,4012	BELIMO BEE (25Nm)
x710	16	184	-	134	113,0	121,2	0,4080	BELIMO BEE (25Nm)
x750	36	204	-	154	117,8	126,2	0,4352	BELIMO BEE (25Nm)
x800	61	229	11	179	122,4	131,0	0,4692	BELIMO BE (40Nm)
x900	111	279	61	229	131,5	140,8	0,5372	BELIMO BE (40Nm)
x1000	161	329	111	279	143,0	152,9	0,6052	BELIMO BE (40Nm)
800x180	-	-	-	-	68,4	74,4	0,0511	BELIMO BEN (15Nm)
x200	-	-	-	-	70,4	76,4	0,0657	BELIMO BEN (15Nm)
x225	-	-	-	-	72,8	78,9	0,0840	BELIMO BEN (15Nm)
x250	-	-	-	-	75,2	81,5	0,1022	BELIMO BEN (15Nm)
x280	-	-	-	-	78,1	84,5	0,1241	BELIMO BEN (15Nm)
x300	-	-	-	-	79,9	86,5	0,1387	BELIMO BEN (15Nm)
x315	-	-	-	-	81,4	88,1	0,1497	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
800x355	-	6,5	-	-	85,3	92,1	0,1789	BELIMO BEN (15Nm)
x400	-	29	-	-	89,5	96,6	0,2117	BELIMO BEN (15Nm)
x450	-	54	-	4	94,3	101,6	0,2482	BELIMO BEN (15Nm)
x500	-	79	-	29	99,2	106,8	0,2847	BELIMO BEN (15Nm)
x550	-	104	-	54	103,9	111,8	0,3212	BELIMO BEN (15Nm)
x560	-	109	-	59	104,9	112,7	0,3285	BELIMO BEN (15Nm)
x600	-	129	-	79	108,7	116,8	0,3577	BELIMO BEE (25Nm)
x630	-	144	-	94	111,6	119,8	0,3796	BELIMO BEE (25Nm)
x650	-	154	-	104	113,6	121,9	0,3942	BELIMO BEE (25Nm)
x700	11	179	-	129	118,3	126,9	0,4307	BELIMO BEE (25Nm)
x710	16	184	-	134	119,3	127,9	0,4380	BELIMO BEE (25Nm)
x750	36	204	-	154	124,3	133,2	0,4672	BELIMO BE (40Nm)
x800	61	229	11	179	129,2	138,2	0,5037	BELIMO BE (40Nm)
x900	111	279	61	229	138,7	148,4	0,5767	BELIMO BE (40Nm)
x1000	161	329	111	279	148,4	158,5	0,6497	BELIMO BE (40Nm)
900x180	-	-	-	-	72,7	72,5	0,0581	BELIMO BEN (15Nm)
x200	-	-	-	-	74,8	81,1	0,0747	BELIMO BEN (15Nm)
x225	-	-	-	-	77,3	83,8	0,0955	BELIMO BEN (15Nm)
x250	-	-	-	-	79,8	86,4	0,1162	BELIMO BEN (15Nm)
x280	-	-	-	-	82,8	89,6	0,1411	BELIMO BEN (15Nm)
x300	-	-	-	-	84,7	91,7	0,1577	BELIMO BEN (15Nm)
x315	-	-	-	-	86,3	93,4	0,1702	BELIMO BEN (15Nm)
x355	-	6,5	-	-	90,2	97,6	0,2034	BELIMO BEN (15Nm)
x400	-	29	-	-	94,8	102,2	0,2407	BELIMO BEN (15Nm)
x450	-	54	-	4	99,8	107,5	0,2822	BELIMO BEN (15Nm)
x500	-	79	-	29	104,9	112,8	0,3237	BELIMO BEE (25Nm)
x550	-	104	-	54	109,9	118,1	0,3652	BELIMO BEE (25Nm)
x560	-	109	-	59	110,9	119,2	0,3735	BELIMO BEE (25Nm)
x600	-	129	-	79	115,0	123,4	0,4067	BELIMO BEE (25Nm)
x630	-	144	-	94	118,0	126,6	0,4316	BELIMO BEE (25Nm)
x650	-	154	-	104	120,0	128,6	0,4482	BELIMO BEE (25Nm)
x700	11	179	-	129	126,2	135,1	0,4897	BELIMO BE (40Nm)
x710	16	184	-	134	127,2	136,2	0,4980	BELIMO BE (40Nm)
x750	36	204	-	154	131,3	140,4	0,5312	BELIMO BE (40Nm)
x800	61	229	11	179	136,3	145,7	0,5727	BELIMO BE (40Nm)
x900	111	279	61	229	146,3	156,2	0,6557	BELIMO BE (40Nm)
x1000	161	329	111	279	156,4	166,8	0,7387	BELIMO BE (40Nm)
1000x180	-	-	-	-	78,1	83,5	0,0651	BELIMO BEN (15Nm)
x200	-	-	-	-	80,2	85,7	0,0837	BELIMO BEN (15Nm)
x225	-	-	-	-	82,9	88,5	0,1070	BELIMO BEN (15Nm)
x250	-	-	-	-	85,6	91,2	0,1302	BELIMO BEN (15Nm)
x280	-	-	-	-	88,8	94,5	0,1581	BELIMO BEN (15Nm)
x300	-	-	-	-	90,8	96,8	0,1767	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
1000x315	-	-	-	-	92,5	98,4	0,1907	BELIMO BEN (15Nm)
x355	-	6,5	-	-	96,7	102,8	0,2279	BELIMO BEN (15Nm)
x400	-	29	-	-	101,5	107,7	0,2697	BELIMO BEN (15Nm)
x450	-	54	-	4	106,9	113,2	0,3162	BELIMO BEE (25Nm)
x500	-	79	-	29	112,2	118,7	0,3627	BELIMO BEE (25Nm)
x550	-	104	-	54	117,6	124,1	0,4092	BELIMO BEE (25Nm)
x560	-	109	-	59	118,7	125,3	0,4185	BELIMO BEE (25Nm)
x600	-	129	-	79	122,9	129,7	0,4557	BELIMO BEE (25Nm)
x630	-	144	-	94	126,1	133,0	0,4836	BELIMO BEE (25Nm)
x650	-	154	-	104	129,5	136,4	0,5022	BELIMO BEE (25Nm)
x700	11	179	-	129	134,8	141,8	0,5487	BELIMO BE (40Nm)
x710	16	184	-	134	135,8	143,0	0,5580	BELIMO BE (40Nm)
x750	36	204	-	154	140,2	147,4	0,5952	BELIMO BE (40Nm)
x800	61	229	11	179	145,4	152,8	0,6417	BELIMO BE (40Nm)
x900	111	279	61	229	156,1	163,9	0,7347	BELIMO BE (40Nm)
x1000	161	329	111	279	166,8	174,9	0,8277	BELIMO BE (40Nm)
1100x180	-	-	-	-	83,4	87,1	0,0721	BELIMO BEN (15Nm)
x200	-	-	-	-	85,7	89,2	0,0927	BELIMO BEN (15Nm)
x225	-	-	-	-	88,6	92,1	0,1185	BELIMO BEN (15Nm)
x250	-	-	-	-	91,3	95,0	0,1442	BELIMO BEN (15Nm)
x280	-	-	-	-	94,7	98,3	0,1751	BELIMO BEN (15Nm)
x300	-	-	-	-	97,0	100,6	0,1957	BELIMO BEN (15Nm)
x315	-	-	-	-	98,6	102,2	0,2112	BELIMO BEN (15Nm)
x355	-	6,5	-	-	103,2	106,8	0,2524	BELIMO BEN (15Nm)
x400	-	29	-	-	108,2	111,9	0,2987	BELIMO BEE (25Nm)
x450	-	54	-	4	114,0	117,5	0,3502	BELIMO BEE (25Nm)
x500	-	79	-	29	119,6	123,2	0,4017	BELIMO BEE (25Nm)
x550	-	104	-	54	125,3	128,9	0,4532	BELIMO BEE (25Nm)
x560	-	109	-	59	126,4	130,0	0,4635	BELIMO BEE (25Nm)
x600	-	129	-	79	130,9	134,6	0,5047	BELIMO BEE (25Nm)
x630	-	144	-	94	135,5	139,0	0,5356	BELIMO BE (40Nm)
x650	-	154	-	104	137,8	141,3	0,5562	BELIMO BE (40Nm)
x700	11	179	-	129	143,4	147,0	0,6077	BELIMO BE (40Nm)
x710	16	184	-	134	144,6	148,1	0,6180	BELIMO BE (40Nm)
x750	36	204	-	154	149,0	152,6	0,6592	BELIMO BE (40Nm)
x800	61	229	11	179	154,7	158,4	0,7107	BELIMO BE (40Nm)
x900	111	279	61	229	166,1	169,6	0,8137	BELIMO BE (40Nm)
x1000	161	329	111	279	177,4	180,9	0,9167	BELIMO BE (40Nm)
1250x180	-	-	-	-	91,4	97,9	0,0826	BELIMO BEN (15Nm)
x200	-	-	-	-	94,0	100,4	0,1062	BELIMO BEN (15Nm)
x225	-	-	-	-	97,0	103,6	0,1357	BELIMO BEN (15Nm)
x250	-	-	-	-	100,1	106,7	0,1652	BELIMO BEN (15Nm)
x280	-	-	-	-	103,7	110,4	0,2006	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
1250x300	-	-	-	-	106,2	113,0	0,2242	BELIMO BEN (15Nm)
x315	-	-	-	-	108,0	114,8	0,2419	BELIMO BEN (15Nm)
x355	-	6,5	-	-	112,9	119,9	0,2891	BELIMO BEE (25Nm)
x400	-	29	-	-	118,4	125,6	0,3422	BELIMO BEE (25Nm)
x450	-	54	-	4	124,6	131,8	0,4012	BELIMO BEE (25Nm)
x500	-	79	-	29	130,7	138,1	0,4602	BELIMO BEE (25Nm)
x550	-	104	-	54	136,8	144,3	0,5192	BELIMO BEE (25Nm)
x560	-	109	-	59	138,0	145,5	0,5310	BELIMO BEE (25Nm)
x600	-	129	-	79	144,1	151,7	0,5782	BELIMO BE (40Nm)
x630	-	144	-	94	147,7	155,5	0,6136	BELIMO BE (40Nm)
x650	-	154	-	104	150,2	158,0	0,6372	BELIMO BE (40Nm)
x700	11	179	-	129	156,4	164,3	0,6962	BELIMO BE (40Nm)
x710	16	184	-	134	157,6	165,6	0,7080	BELIMO BE (40Nm)
x750	36	204	-	154	162,5	170,5	0,7552	BELIMO BE (40Nm)
x800	61	229	11	179	168,6	176,8	0,8142	BELIMO BE (40Nm)
x900	111	279	61	229	180,8	189,4	0,9322	BELIMO BE (40Nm)
x1000	161	329	111	279	192,9	204,6	1,0502	SCHISCHEK InMax50.75 (75Nm)
1400x180	-	-	-	-	95,3	104,0	0,0931	BELIMO BEN (15Nm)
x200	-	-	-	-	97,9	106,5	0,1197	BELIMO BEN (15Nm)
x225	-	-	-	-	101,1	109,8	0,1530	BELIMO BEN (15Nm)
x250	-	-	-	-	104,2	113,0	0,1862	BELIMO BEN (15Nm)
x280	-	-	-	-	108,0	117,0	0,2261	BELIMO BEN (15Nm)
x300	-	-	-	-	110,5	119,6	0,2527	BELIMO BEN (15Nm)
x315	-	-	-	-	112,5	121,6	0,2727	BELIMO BEN (15Nm)
x355	-	6,5	-	-	117,4	126,8	0,3259	BELIMO BEE (25Nm)
x400	-	29	-	-	123,2	132,7	0,3857	BELIMO BEE (25Nm)
x450	-	54	-	4	129,5	139,3	0,4522	BELIMO BEE (25Nm)
x500	-	79	-	29	135,8	145,8	0,5187	BELIMO BEE (25Nm)
x550	-	104	-	54	143,3	153,5	0,5852	BELIMO BEE (25Nm)
x560	-	109	-	59	144,6	154,9	0,5985	BELIMO BE (40Nm)
x600	-	129	-	79	149,6	160,1	0,6517	BELIMO BE (40Nm)
x630	-	144	-	94	153,4	164,1	0,6916	BELIMO BE (40Nm)
x650	-	154	-	104	155,9	166,6	0,7182	BELIMO BE (40Nm)
x700	11	179	-	129	162,2	173,2	0,7847	BELIMO BE (40Nm)
x710	16	184	-	134	163,4	174,6	0,7980	BELIMO BE (40Nm)
x750	36	204	-	154	168,5	179,7	0,8512	BELIMO BE (40Nm)
x800	61	229	11	179	174,8	186,3	0,9177	BELIMO BE (40Nm)
x900	111	279	61	229	195,3	207,2	1,0507	SCHISCHEK InMax50.75 (75Nm)
x1000	161	329	111	279	207,9	220,3	1,1837	SCHISCHEK InMax50.75 (75Nm)
1500x180	-	-	-	-	100,5	109,5	0,1001	BELIMO BEN (15Nm)
x200	-	-	-	-	103,2	112,2	0,1287	BELIMO BEN (15Nm)
x225	-	-	-	-	106,5	115,7	0,1645	BELIMO BEN (15Nm)
x250	-	-	-	-	109,8	119,1	0,2002	BELIMO BEN (15Nm)

Smoke Control Damper

SDR2-M

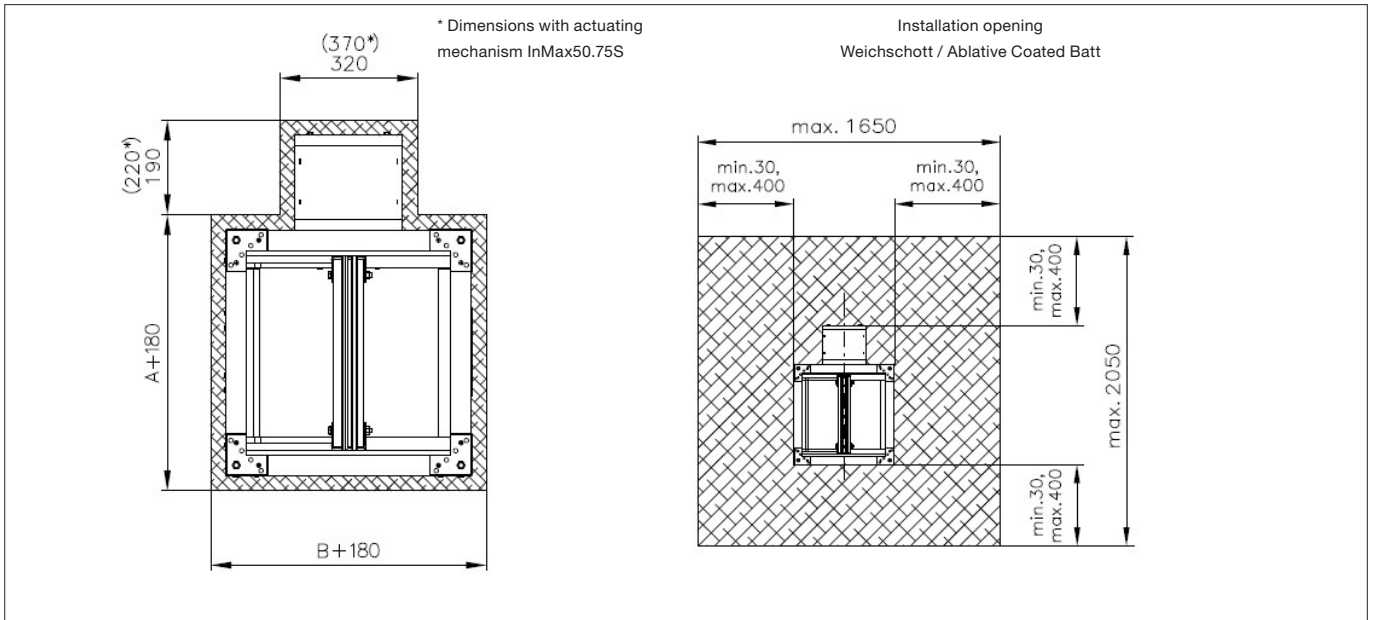
Size AxB	Without flanges		With flanges		Weight [kg]		Effective area S_{ef} [m ²]	Actuating mechanism type
	a	b	e	f	Without flanges	With flanges		
1500x280	-	-	-	-	113,7	123,3	0,2431	BELIMO BEN (15Nm)
x300	-	-	-	-	116,4	125,9	0,2717	BELIMO BEN (15Nm)
x315	-	-	-	-	118,3	128,0	0,2932	BELIMO BEE (25Nm)
x355	-	6,5	-	-	123,6	133,5	0,3504	BELIMO BEE (25Nm)
x400	-	29	-	-	129,6	139,7	0,4147	BELIMO BEE (25Nm)
x450	-	54	-	4	136,3	146,5	0,4862	BELIMO BEE (25Nm)
x500	-	79	-	29	142,8	153,4	0,5577	BELIMO BEE (25Nm)
x550	-	104	-	54	150,7	161,5	0,6292	BELIMO BE (40Nm)
x560	-	109	-	59	151,9	162,7	0,6435	BELIMO BE (40Nm)
x600	-	129	-	79	157,2	168,2	0,7007	BELIMO BE (40Nm)
x630	-	144	-	94	161,2	172,4	0,7436	BELIMO BE (40Nm)
x650	-	154	-	104	163,9	175,1	0,7722	BELIMO BE (40Nm)
x700	11	179	-	129	170,4	181,9	0,8437	BELIMO BE (40Nm)
x710	16	184	-	134	171,8	183,3	0,8580	BELIMO BE (40Nm)
x750	36	204	-	154	177,1	188,8	0,9152	BELIMO BE (40Nm)
x800	61	229	11	179	183,7	195,6	0,9867	BELIMO BE (40Nm)
x900	111	279	61	229	204,7	217,2	1,1297	SCHISCHEK InMax50.75 (75Nm)
x1000	161	329	111	279	217,9	230,9	1,2727	SCHISCHEK InMax50.75 (75Nm)
1600x180	-	-	-	-	105,7	115,1	0,1071	BELIMO BEN (15Nm)
x200	-	-	-	-	108,4	118,0	0,1377	BELIMO BEN (15Nm)
x225	-	-	-	-	111,9	121,6	0,1760	BELIMO BEN (15Nm)
x250	-	-	-	-	115,3	125,1	0,2142	BELIMO BEN (15Nm)
x280	-	-	-	-	119,5	129,5	0,2601	BELIMO BEN (15Nm)
x300	-	-	-	-	122,2	132,4	0,2907	BELIMO BEE (25Nm)
x315	-	-	-	-	124,3	134,4	0,3137	BELIMO BEE (25Nm)
x355	-	6,5	-	-	129,8	140,2	0,3749	BELIMO BEE (25Nm)
x400	-	29	-	-	136,0	146,6	0,4437	BELIMO BEE (25Nm)
x450	-	54	-	4	142,9	153,8	0,5202	BELIMO BEE (25Nm)
x500	-	79	-	29	149,8	160,9	0,5967	BELIMO BEE (25Nm)
x550	-	104	-	54	158,0	169,3	0,6732	BELIMO BE (40Nm)
x560	-	109	-	59	159,4	170,7	0,6885	BELIMO BE (40Nm)
x600	-	129	-	79	164,9	176,4	0,7497	BELIMO BE (40Nm)
x630	-	144	-	94	169,1	180,7	0,7956	BELIMO BE (40Nm)
x650	-	154	-	104	171,8	183,5	0,8262	BELIMO BE (40Nm)
x700	11	179	-	129	178,7	190,7	0,9027	BELIMO BE (40Nm)
x710	16	184	-	134	180,1	192,2	0,9180	BELIMO BE (40Nm)
x750	36	204	-	154	185,6	197,8	0,9792	BELIMO BE (40Nm)
x800	61	229	11	179	192,5	205,0	1,0557	BELIMO BE (40Nm)
x900	111	279	61	229	214,1	227,1	1,2087	SCHISCHEK InMax50.75 (75Nm)
x1000	161	329	111	279	228,0	241,4	1,3617	SCHISCHEK InMax50.75 (75Nm)

If is used the communication and supply device BKNE230-24, the weight is higher by 0,68 kg.

Smoke Control Damper

SDR2-M

Fig. 16 Installation opening



3.3. Dampers without flanges

For damper without flanges (Fig. 18) the open damper blade overlaps the damper body from dimension $B = 250$ by the value "c" or "a" and "c". These values are specified in the Tab. 3.2.1.

For damper without flanges (Fig. 19) the open damper blade overlaps the damper body from dimension $B = 355$ by the value "f" or "e" and "f". These values are specified in the Tab. 3.2.1.

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

Fig. 18 Values "a" a "c"

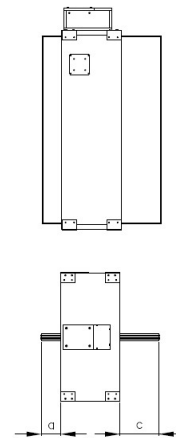


Fig. 19 Values "e" a "f"

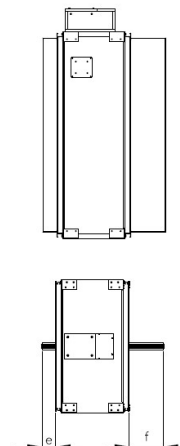
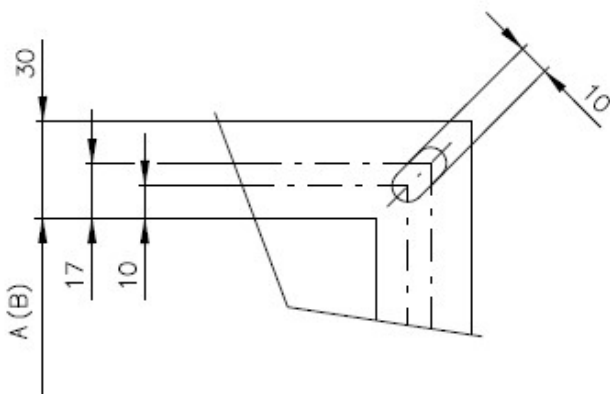


Fig. 17 Flanges



Smoke Control Damper

SDR2-M

4. Placement and Assembly

4.1. Smoke control dampers - multi are designed to remove heat and combustion products (e.g. smoke) from fire compartments according EN1366-8.

Smoke control dampers - multi are designed to horizontal or vertical installation with arbitrary blade axis position.

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

4.2. The distance between the smoke damper:

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

4.3. 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 built in, its blade should not grind on the damper casing during opening or closing.

4.4.1. Installation example

Tab. 4.4.1. Installation overview

Placement	Wall / ceiling	Filling of space between damper and wall	Fire resistance	Page
	Min. thickness [mm]			
In solid wall construction	100	Mineral stone wool, surface is covered by fire protection mastic and cement lime plate	EI120 (v _{ew} - i↔o)S 1000C _{mod} HOT 400/30 AA Multi	31
		Mortar or gypsum	EI90 (v _{ew} - i↔o)S 1500C _{mod} HOT 400/30 AA Multi	32
		Weichschott / Ablative Coated Batt		33
In solid ceiling construction	150	Mineral stone wool, surface is covered by fire protection mastic and cement lime plate	EI120 (h _{ow} - i↔o)S 1500C _{mod} HOT 400/30 AA Multi	34
		Mortar or gypsum		35
		Weichschott / Ablative Coated Batt		36
In gypsum wall construction	100	Mineral stone wool, surface is covered by fire protection mastic and cement lime plate	EI120 (v _{ew} - i↔o)S 1000C _{mod} HOT 400/30 AA Multi EI90 (v _{ew} - i↔o)S 1500C _{mod} HOT 400/30 AA Multi	37
		Mortar or gypsum		37
		Weichschott / Ablative Coated Batt		38
On solid wall construction	100	-	EI120 (v _{ew} - i↔o)S 1000C _{mod} HOT 400/30 AA Multi	39
On solid ceiling construction	150	-	EI90 (h _{ow} - i↔o)S 1000C _{mod} HOT 400/30 AA Multi	40
Vertical duct installation	-	-	EI120(h _{od} - i↔o)S 1000C _{mod} HOT 400/30 MA Multi EI120 (h _{od} - i↔o)S 1000C _{mod} HOT 400/30 AA Multi	41
Horizontal duct installation	-	-	EI120 (v _{ed} - i↔o)S 1000C _{mod} HOT 400/30 MA Multi EI120 (v _{ed} - i↔o)S 1000C _{mod} HOT 400/30 AA Multi	42

Smoke Control Damper

SDR2-M

4.4.1. Installation in solid wall or ceiling construction of fire compartment

Fig. 20 Example of installation in solid wall construction of fire compartment - vertical blade axis position.

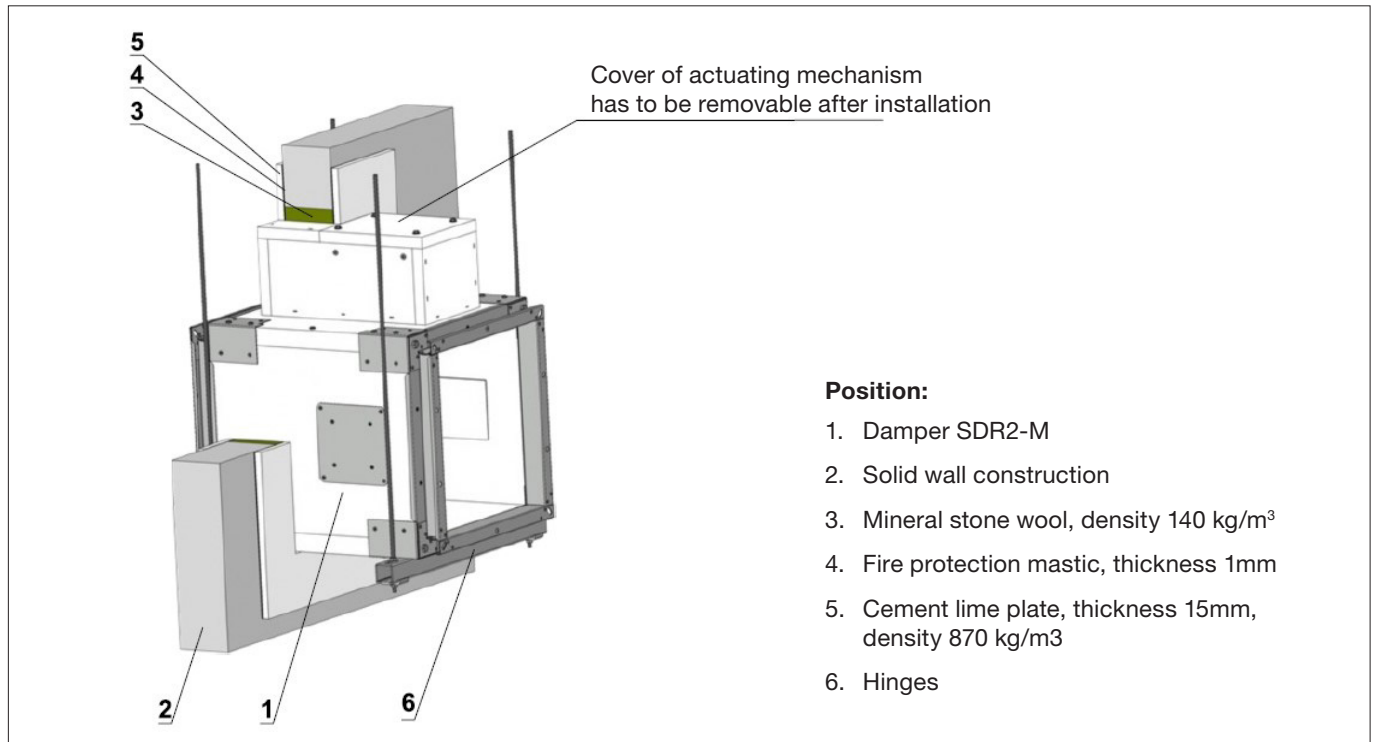
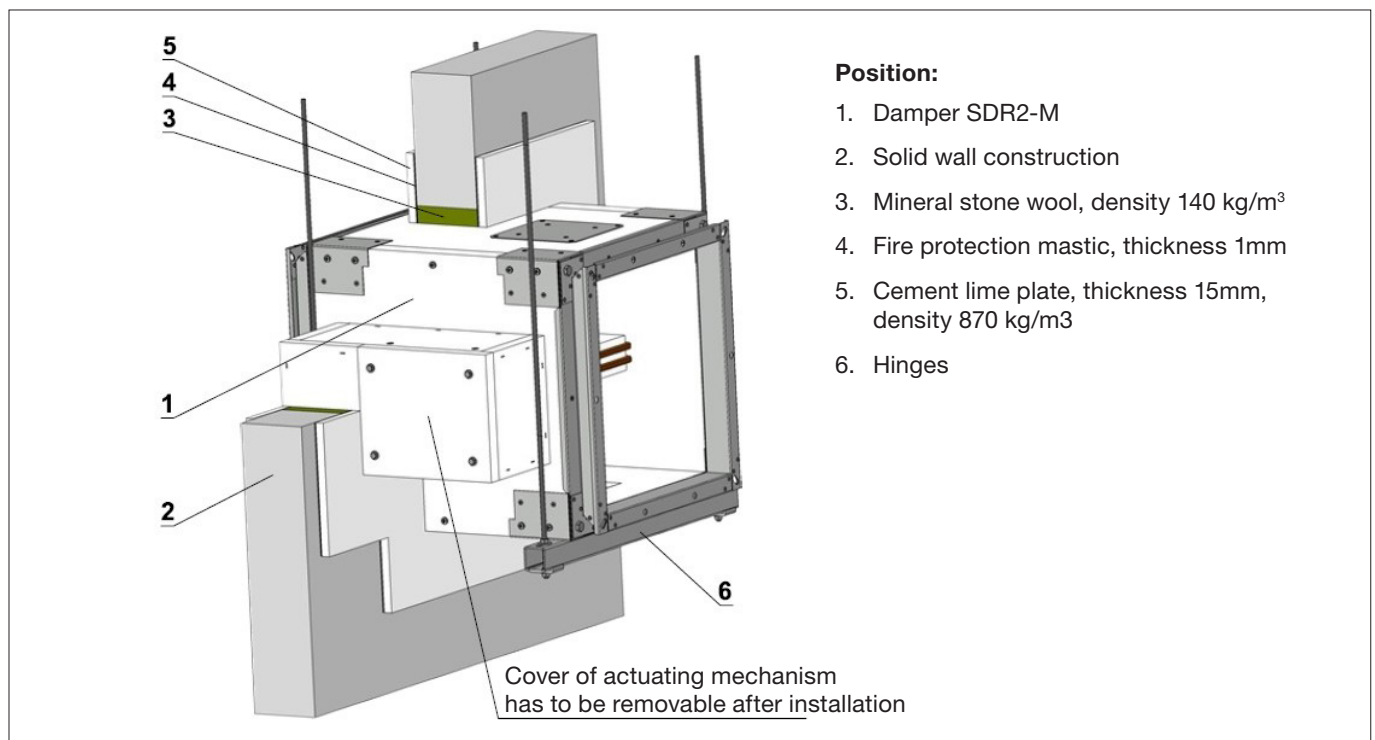


Fig. 21 Example of installation in solid wall construction of fire compartment - horizontal blade axis position.



Smoke Control Damper

SDR2-M

Fig. 22 Example of installation in solid wall construction of fire compartment - vertical blade axis position

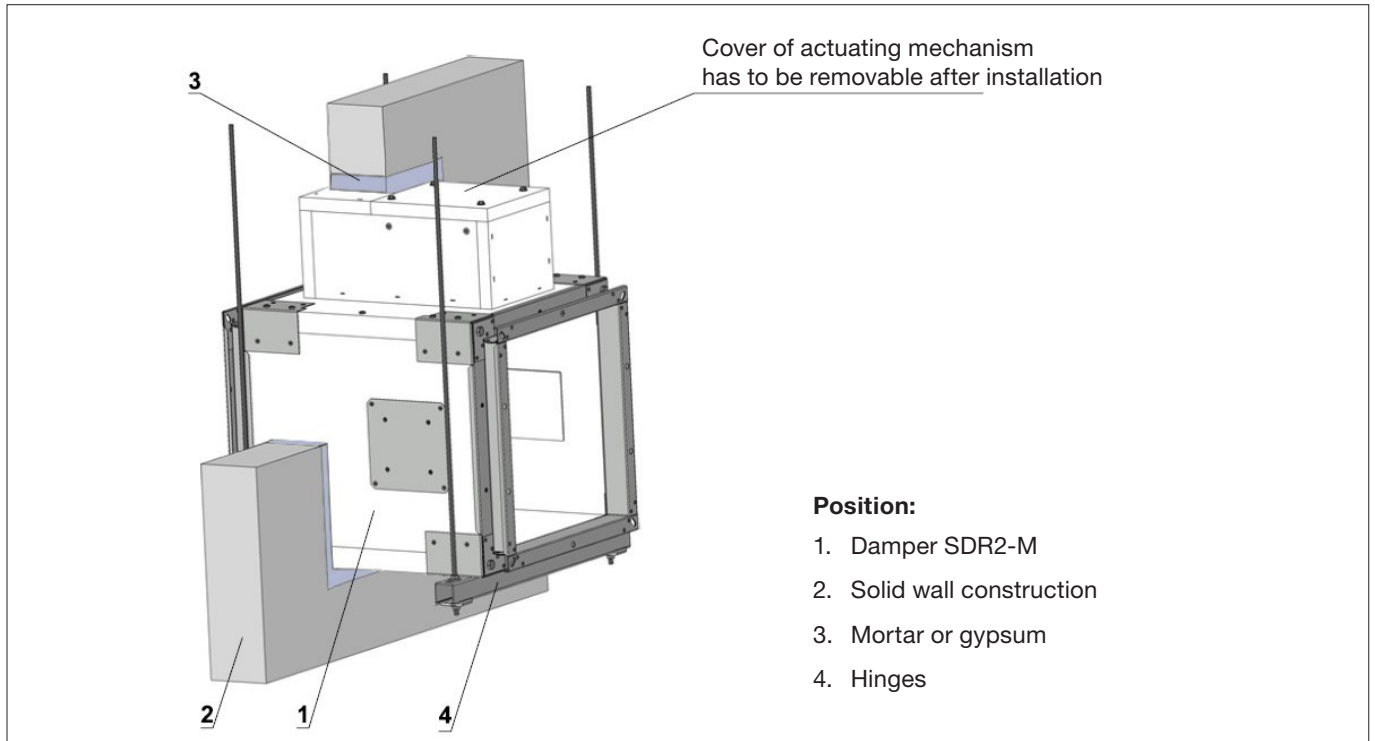
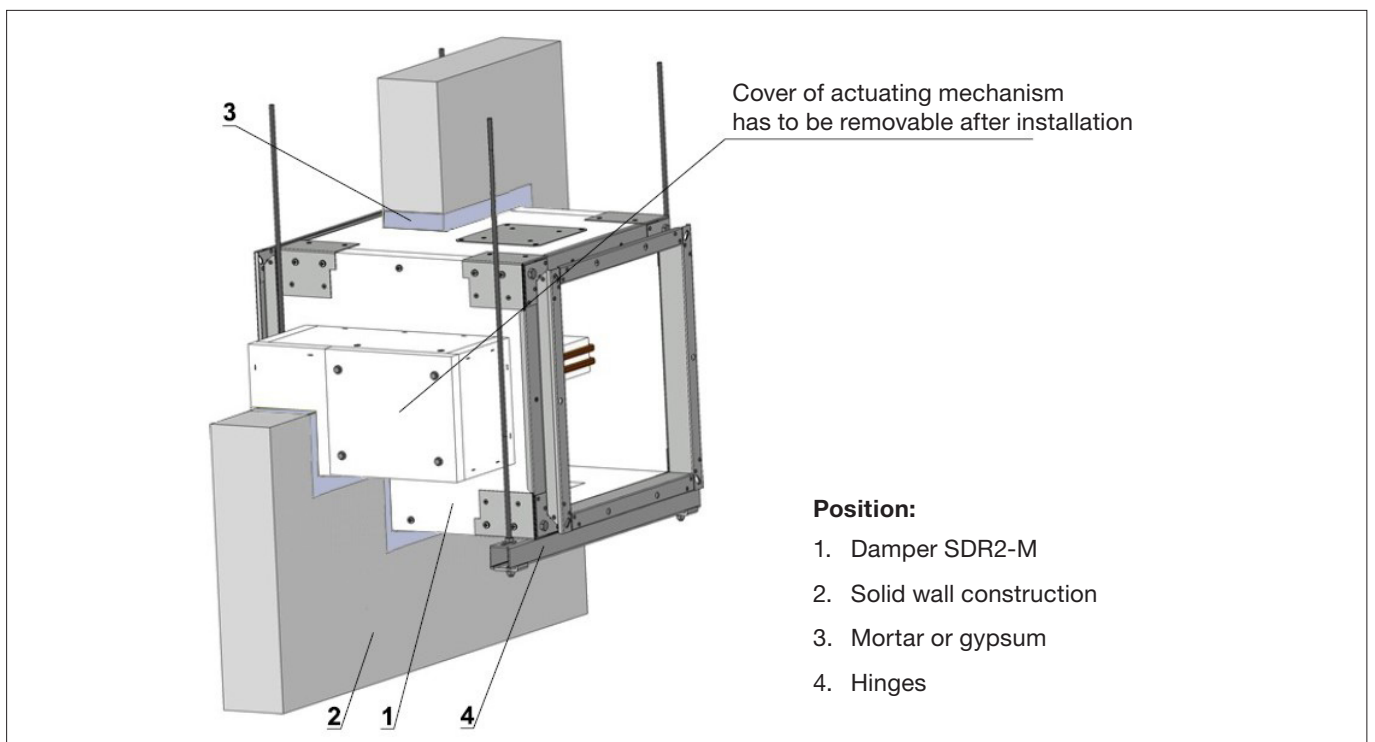


Fig. 23 Example of installation in solid wall construction of fire compartment - horizontal blade axis position.



Smoke Control Damper

SDR2-M

Fig. 24 Example of installation in solid wall construction of fire compartment - vertical blade axis position.

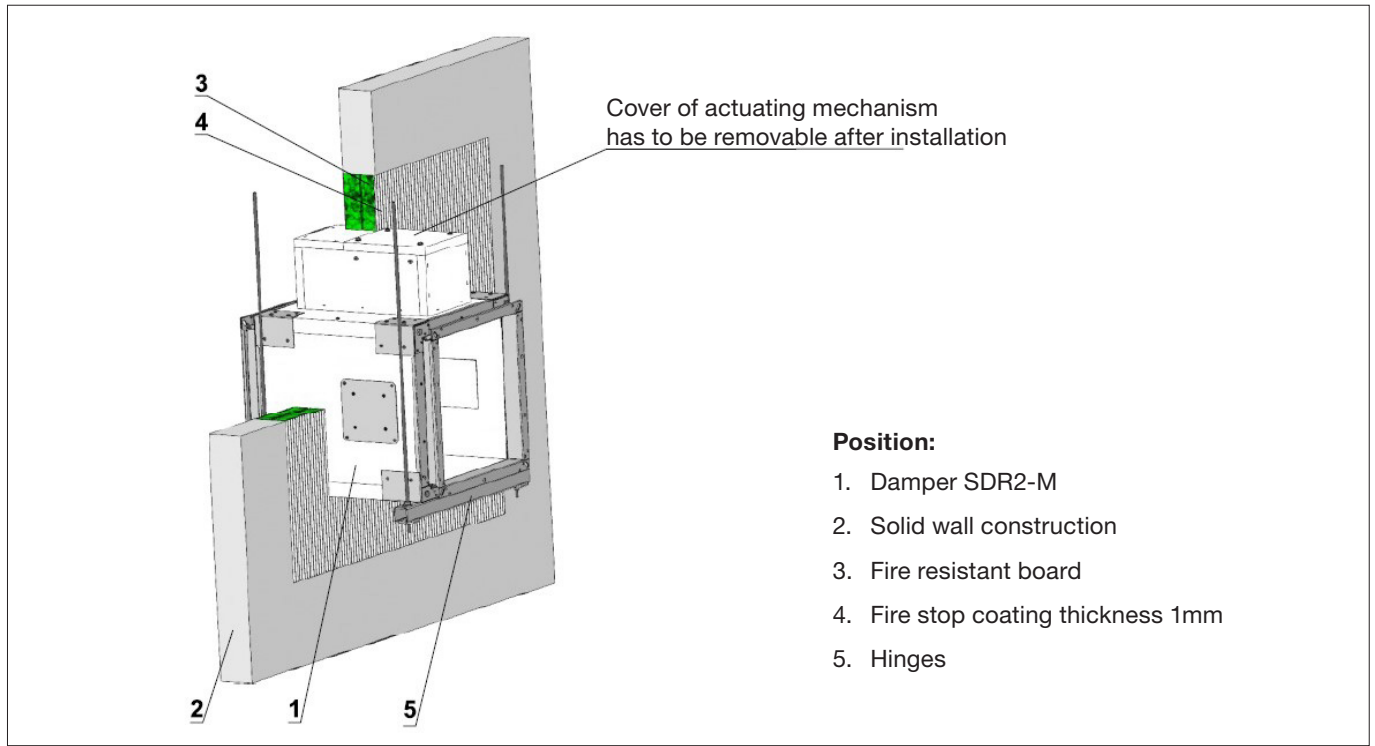
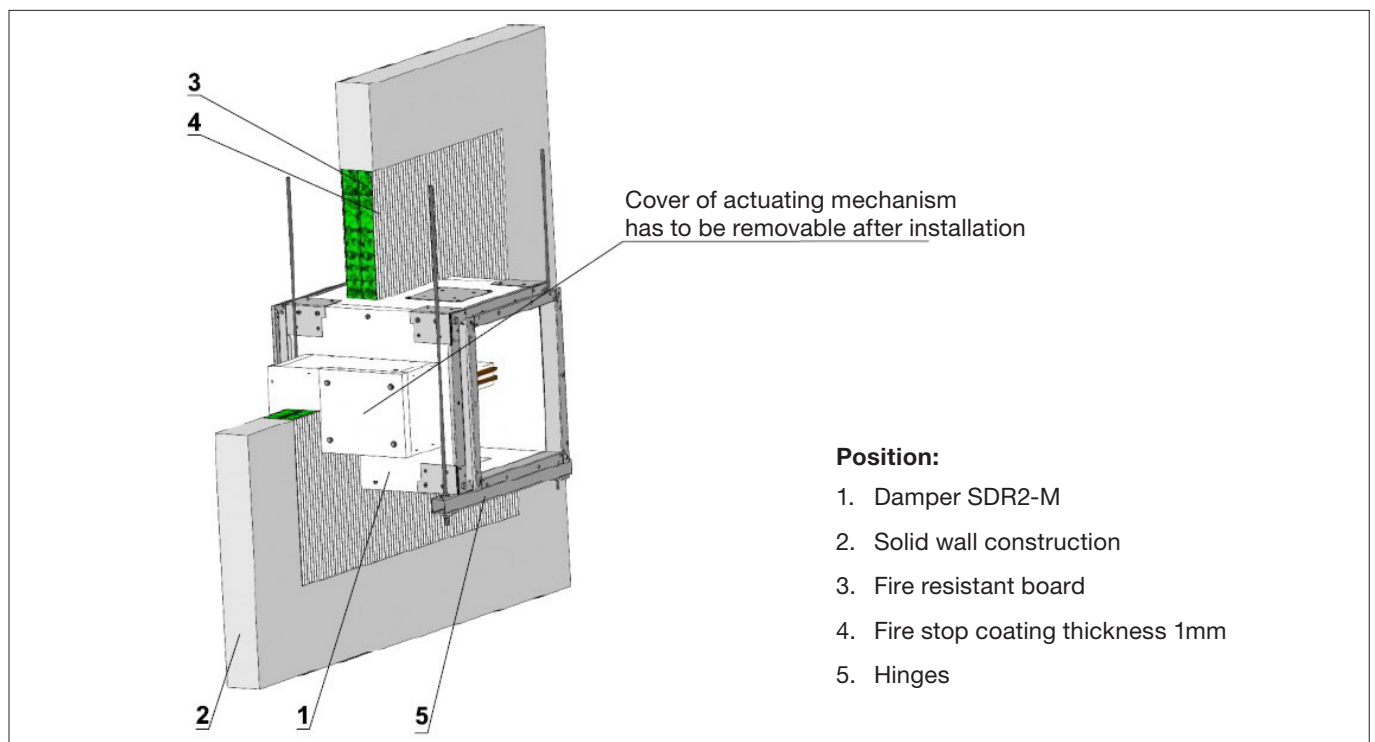


Fig. 25 Example of installation in solid wall construction of fire compartment - horizontal blade axis position.



Smoke Control Damper

SDR2-M

Fig. 26 Example of installation in solid ceiling construction of fire compartment - actuating mechanism below

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Mineral stone wool, density 140 kg/m³
4. Fire protection mastic, thickness 1mm
5. Cement lime plate, thickness 15mm, density 870 kg/m³
6. Hinges

Number of holders X = (2xZA)+(2xZB)

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Fig. 27 Example of installation in solid ceiling construction of fire compartment - actuating mechanism above

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Mineral stone wool, density 140 kg/m³
4. Fire protection mastic, thickness 1mm
5. Cement lime plate, thickness 15mm, density 870 kg/m³
6. Hinges

Number of holders X = 2*((2xZA)+(2xZB))

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Smoke Control Damper

SDR2-M

Fig. 28 Example of installation in solid ceiling construction of fire compartment - actuating mechanism below

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Mortar or gypsum
4. Hinges

Number of holders $X = (2 \times ZA) + (2 \times ZB)$

Dimension A	Number ZA	Dimension B	Number ZB
$A \leq 560$	1	$B \leq 560$	1
$560 < A \leq 900$	2	$560 < B \leq 800$	2
$900 < A \leq 1250$	3	$800 < B \leq 1000$	3
$1250 < A \leq 1600$	4		

Fig. 29 Example of installation in solid ceiling construction of fire compartment - actuating mechanism above

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Mortar or gypsum
4. Hinges

Number of holders $X = 2 * ((2 \times ZA) + (2 \times ZB))$

Dimension A	Number ZA	Dimension B	Number ZB
$A \leq 560$	1	$B \leq 560$	1
$560 < A \leq 900$	2	$560 < B \leq 800$	2
$900 < A \leq 1250$	3	$800 < B \leq 1000$	3
$1250 < A \leq 1600$	4		

Smoke Control Damper

SDR2-M

Fig. 30 Example of installation in solid ceiling construction of fire compartment - actuating mechanism bellow

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Fire resistant board
4. Fire stop coating thickness 1mm
5. Hinges

Number of holders X = (2xZA)+(2xZB)

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Fig. 31 Example of installation in solid ceiling construction of fire compartment - actuating mechanism above

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Fire resistant board
4. Fire stop coating thickness 1mm
5. Hinges

Number of holders X = (2xZA)+(2xZB)

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Smoke Control Damper

SDR2-M

4.4.2. Installation in gypsum wall construction of fire compartment

Fig. 32 Example of installation in gypsum wall construction of fire compartment.

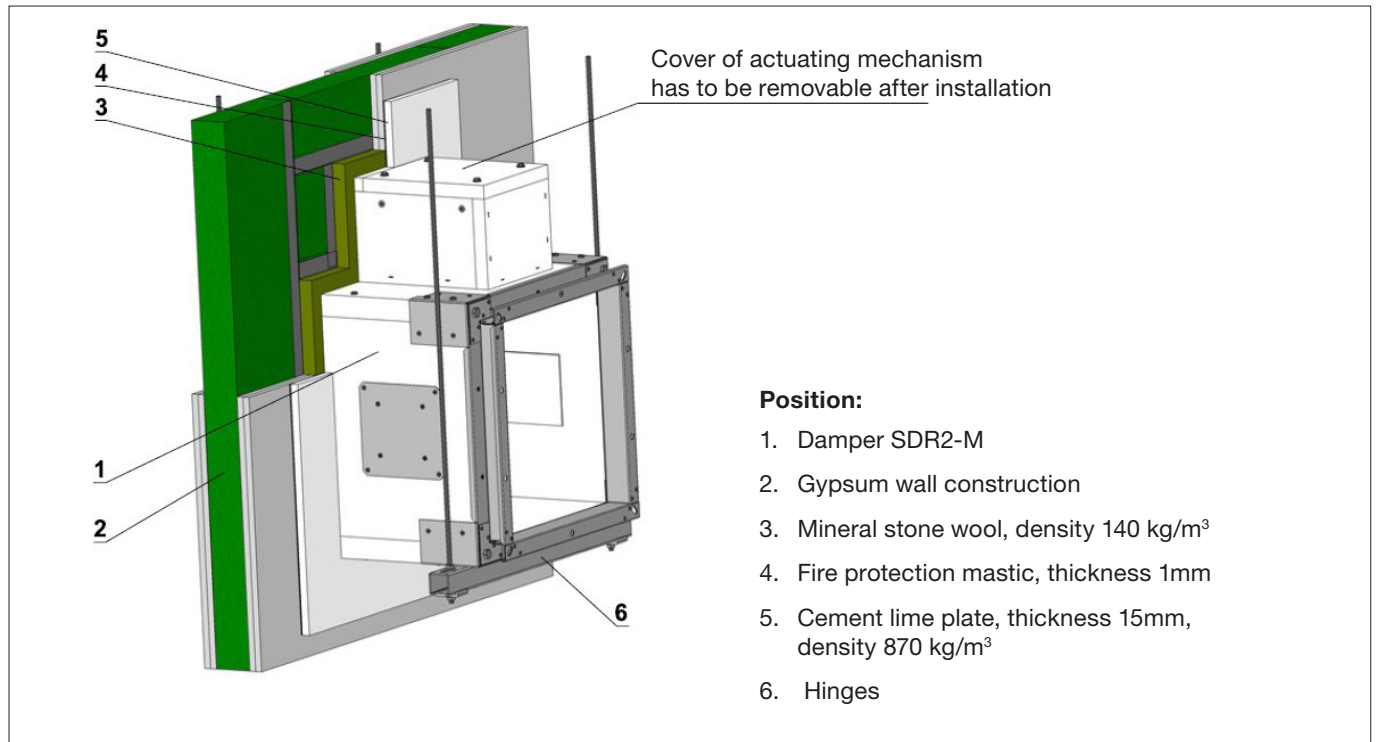
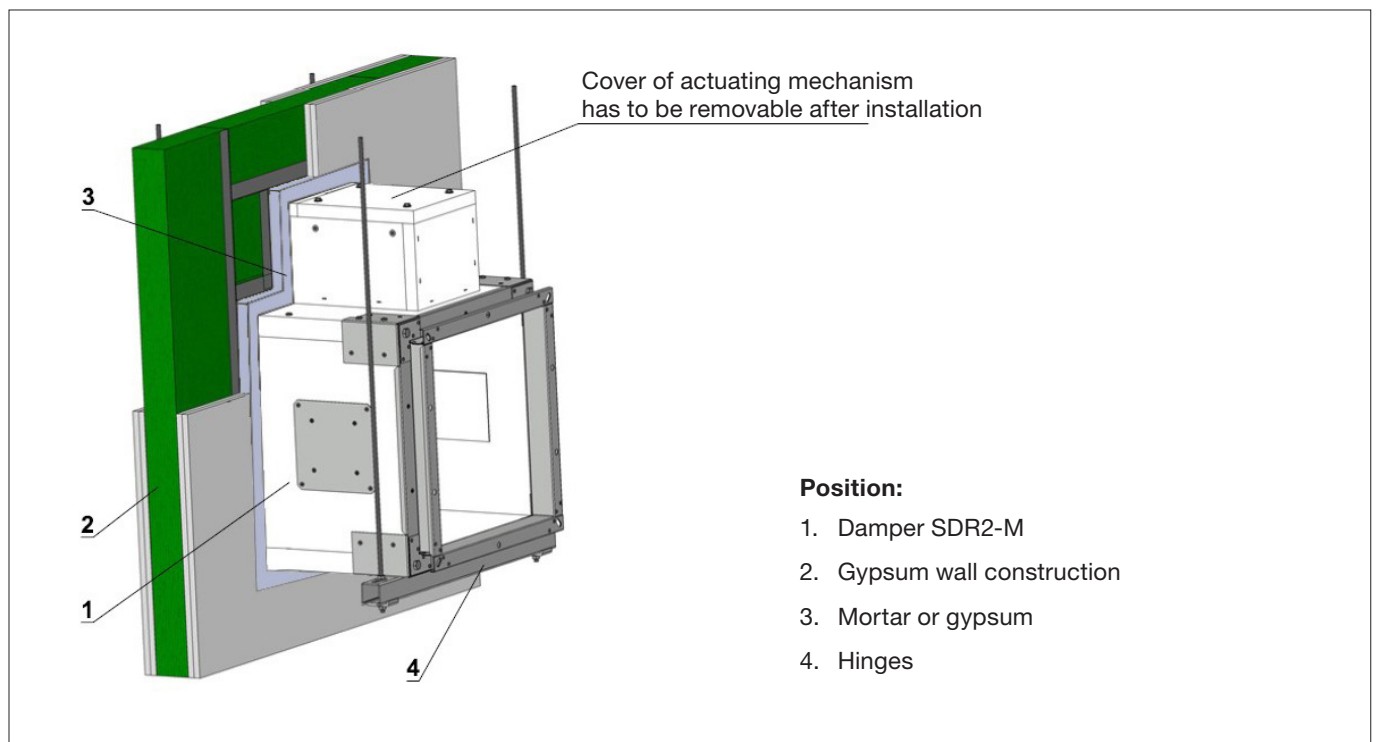


Fig. 33 Example of installation in gypsum wall construction of fire compartment.



Smoke Control Damper

SDR2-M

Fig. 34 Example of installation in gypsum wall construction of fire compartment - vertical blade axis position.

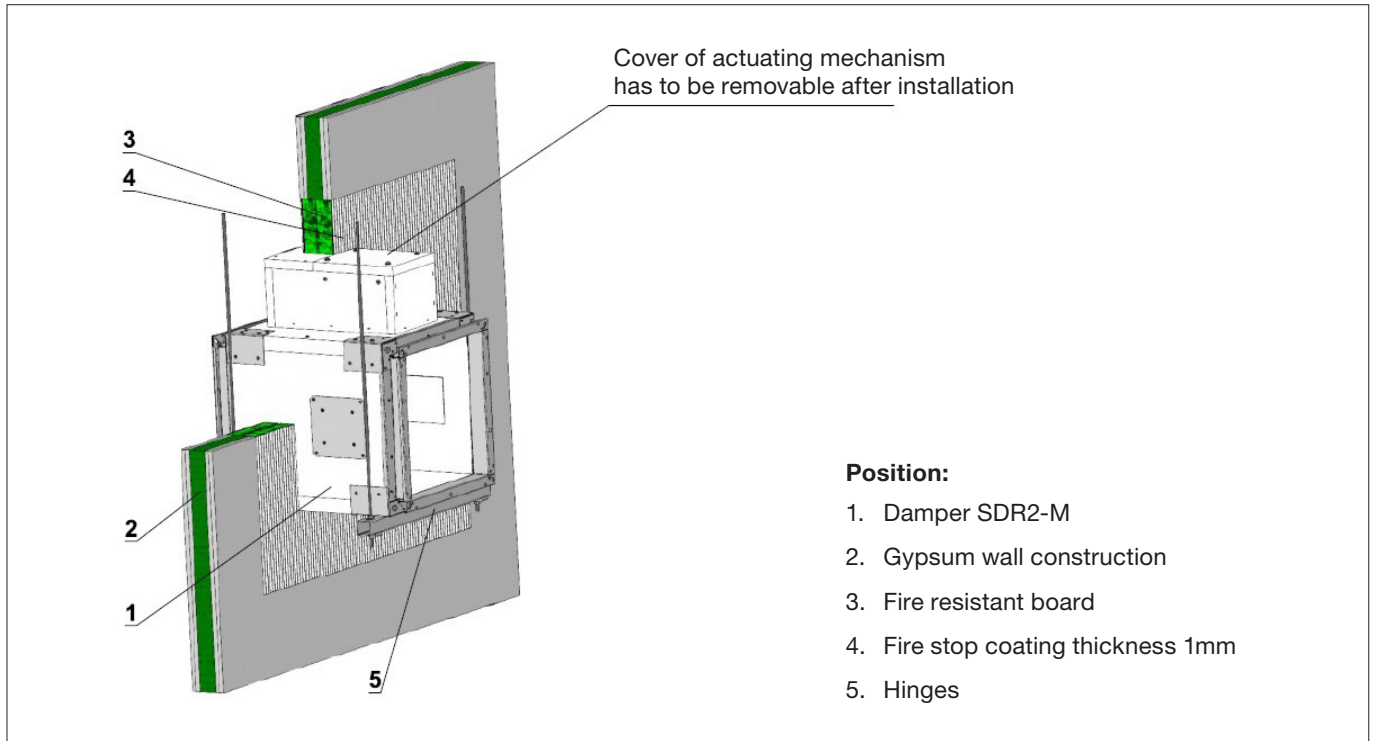
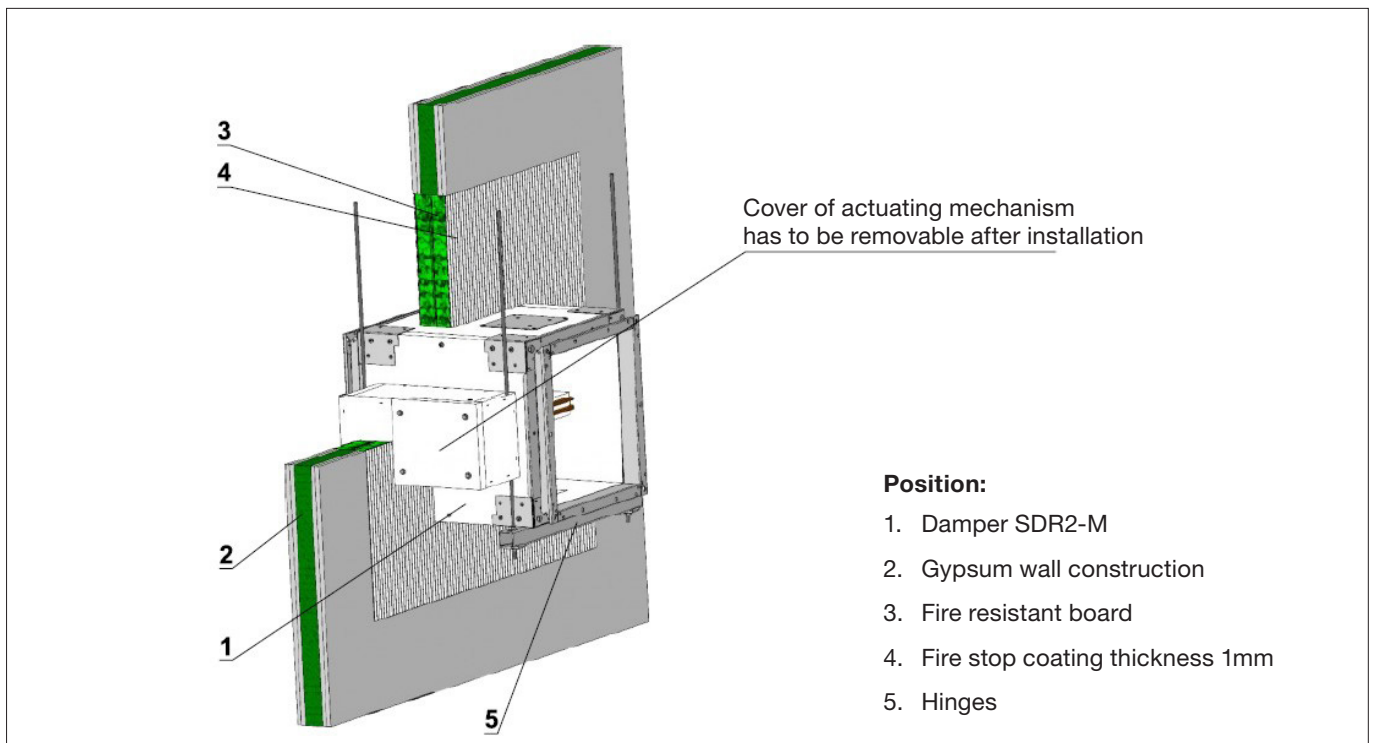


Fig. 35 Example of installation in gypsum wall construction of fire compartment - horizontal blade axis position.



Smoke Control Damper

SDR2-M

4.4.3. Installation on solid wall or ceiling construction of fire compartment

Fig. 36 Example of installation on solid wall construction of fire compartment. - vertical blade axis position.

Number of holders X = (2xZA)+(2xZB)

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Position:

1. Damper SDR2-M
2. Solid wall construction
3. Ceramic paper*
4. Hinges

* Ceramic paper is placed between damper and solid wall construction

Fig. 37 Example of installation on solid wall construction of fire compartment - horizontal blade axis position.

Number of holders X = (2xZA)+(2xZB)

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Position:

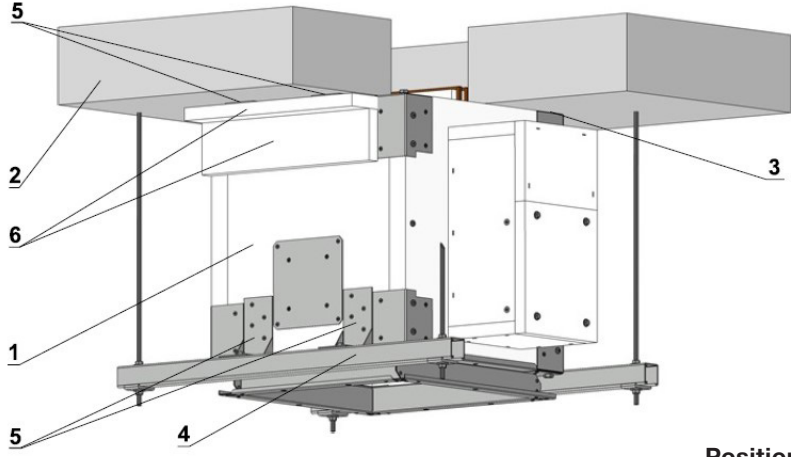
1. Damper SDR2-M
2. Solid wall construction
3. Ceramic paper*
4. Hinges

* Ceramic paper is placed between damper and solid wall construction

Smoke Control Damper

SDR2-M

Fig. 38 Example of installation on solid ceiling construction of fire compartment - suspension.



Number of holders X = 2*((2xZA) + (2xZB))

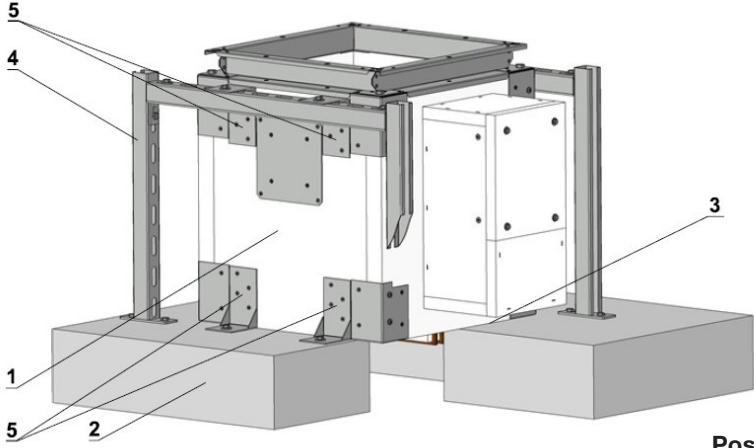
Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Ceramic paper*
4. Hinges
5. Holder L
6. Cement lime plate

* Ceramic paper is placed between damper and solid wall construction

Fig. 39 Example of installation on solid ceiling construction of fire compartment - above installation.



Number of holders X = 2*((2xZA) + (2xZB))

Dimension A	Number ZA	Dimension B	Number ZB
A ≤ 560	1	B ≤ 560	1
560 < A ≤ 900	2	560 < B ≤ 800	2
900 < A ≤ 1250	3	800 < B ≤ 1000	3
1250 < A ≤ 1600	4		

Position:

1. Damper SDR2-M
2. Solid ceiling construction
3. Ceramic paper*
4. Hinges
5. Holder L

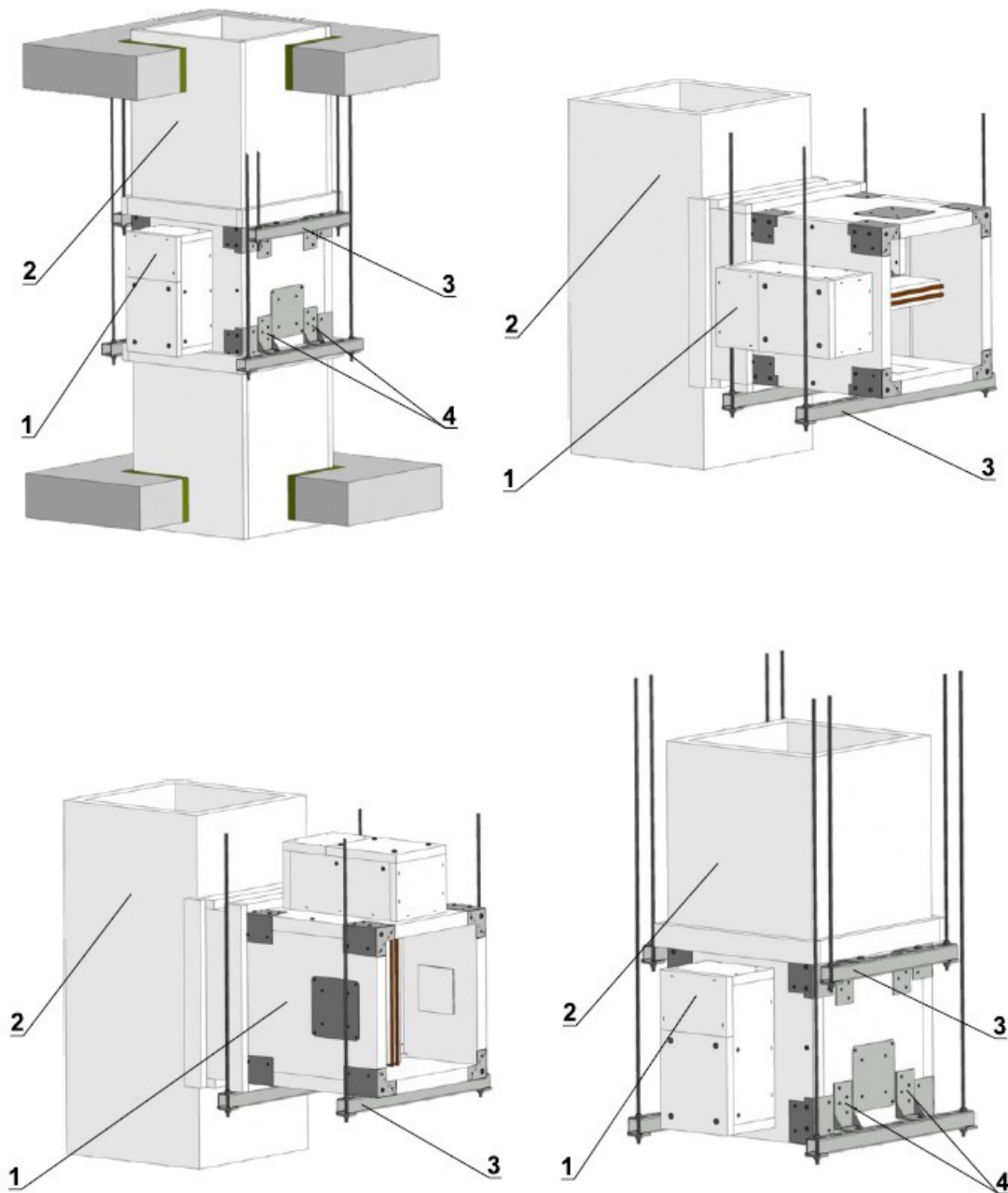
* Ceramic paper is placed between damper and solid wall construction

Smoke Control Damper

SDR2-M

4.4.4. Installation in smoke exhaust duct

Fig. 40 Example of installation in vertical smoke exhaust duct.



Number of holders $X = 2 \cdot ((2 \times Z_A) + (2 \times Z_B))$

Dimension A	Number Z _A	Dimension B	Number Z _B
$A \leq 560$	1	$B \leq 560$	1
$560 < A \leq 900$	2	$560 < B \leq 800$	2
$900 < A \leq 1250$	3	$800 < B \leq 1000$	3
$1250 < A \leq 1600$	4		

Position:

- 1. Damper SDR2-M
- 2. Duct
- 3. Hinges
- 4. Holder L

Smoke Control Damper

SDR2-M

Fig. 41 Example of installation in vertical smoke exhaust duct.

Position:

1. Damper SDR2-M
2. Duct
3. Hinges
4. Holder L

Number of holders $X = 2 * ((2xZA) + (2xZB))$

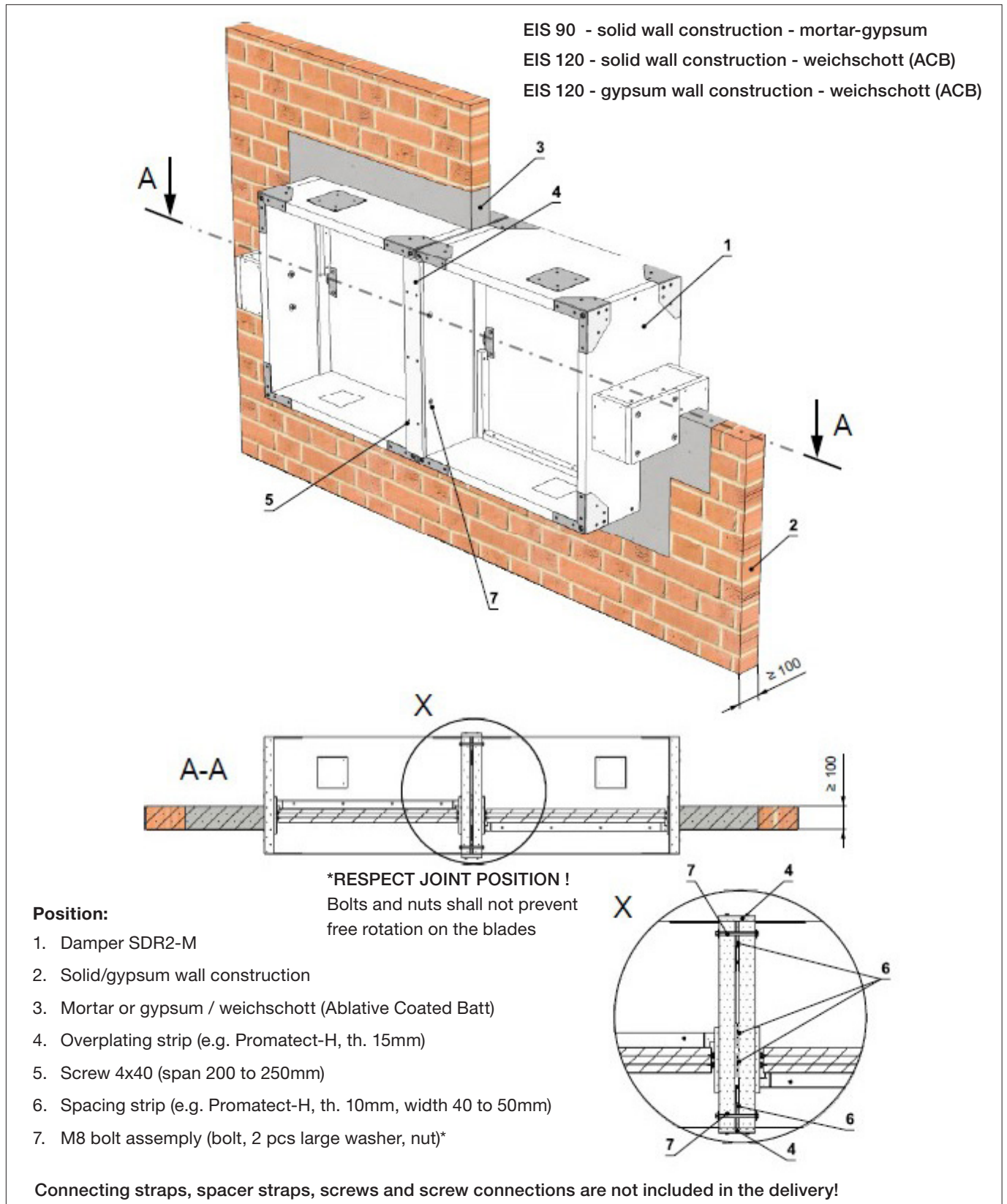
Dimension A	Number ZA	Dimension B	Number ZB
$A \leq 560$	1	$B \leq 560$	1
$560 < A \leq 900$	2	$560 < B \leq 800$	2
$900 < A \leq 1250$	3	$800 < B \leq 1000$	3
$1250 < A \leq 1600$	4		

Smoke Control Damper

SDR2-M

4.4.5. Installation in battery

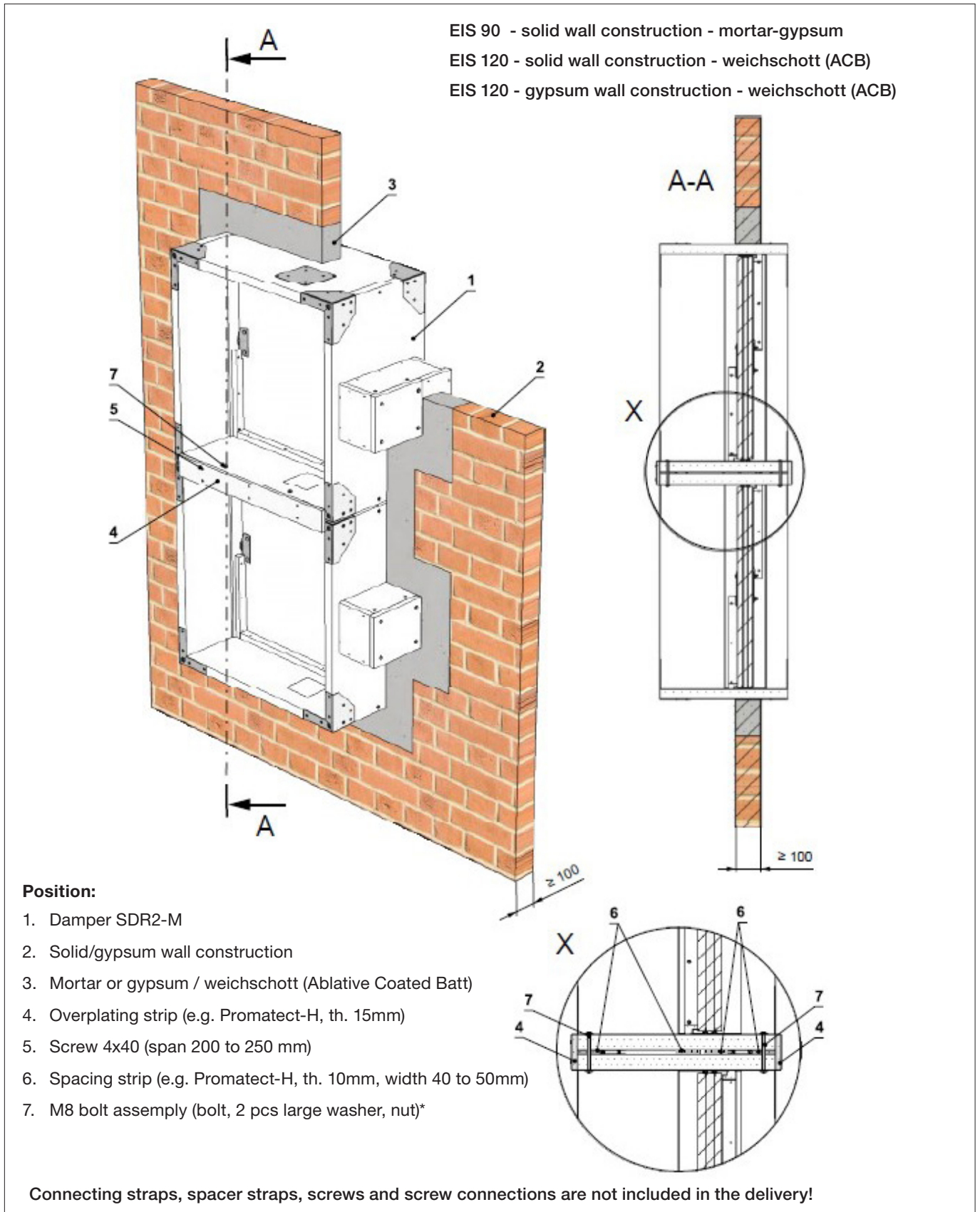
Fig. 42 2 dampers side by side - solid / gypsum wall construction - mortar or gypsum / weichschott (Ablative Coated Batt).



Smoke Control Damper

SDR2-M

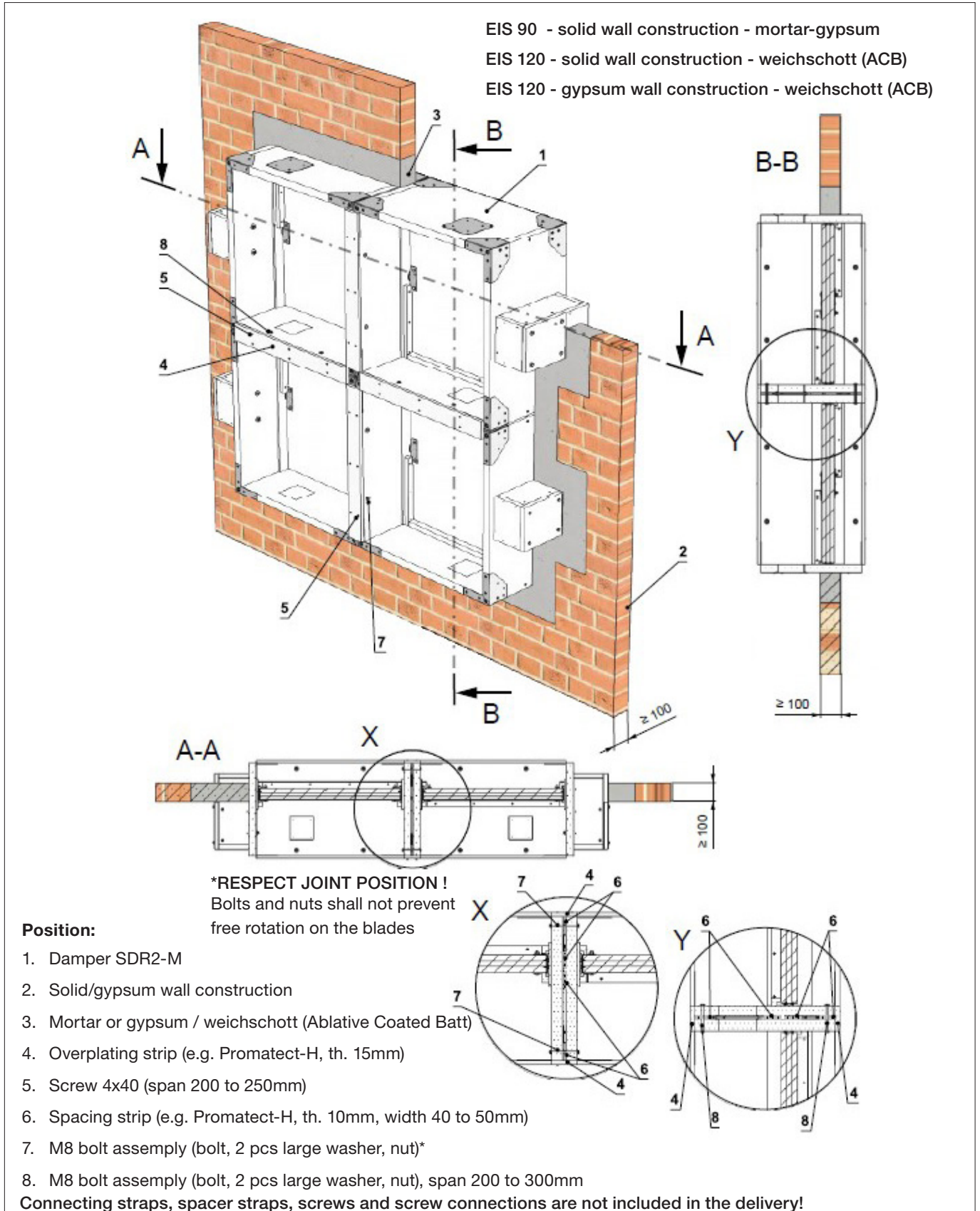
Fig. 43 2 dampers on top of each other - solid / gypsum wall construction - mortar or gypsum / weichschott (ACB)



Smoke Control Damper

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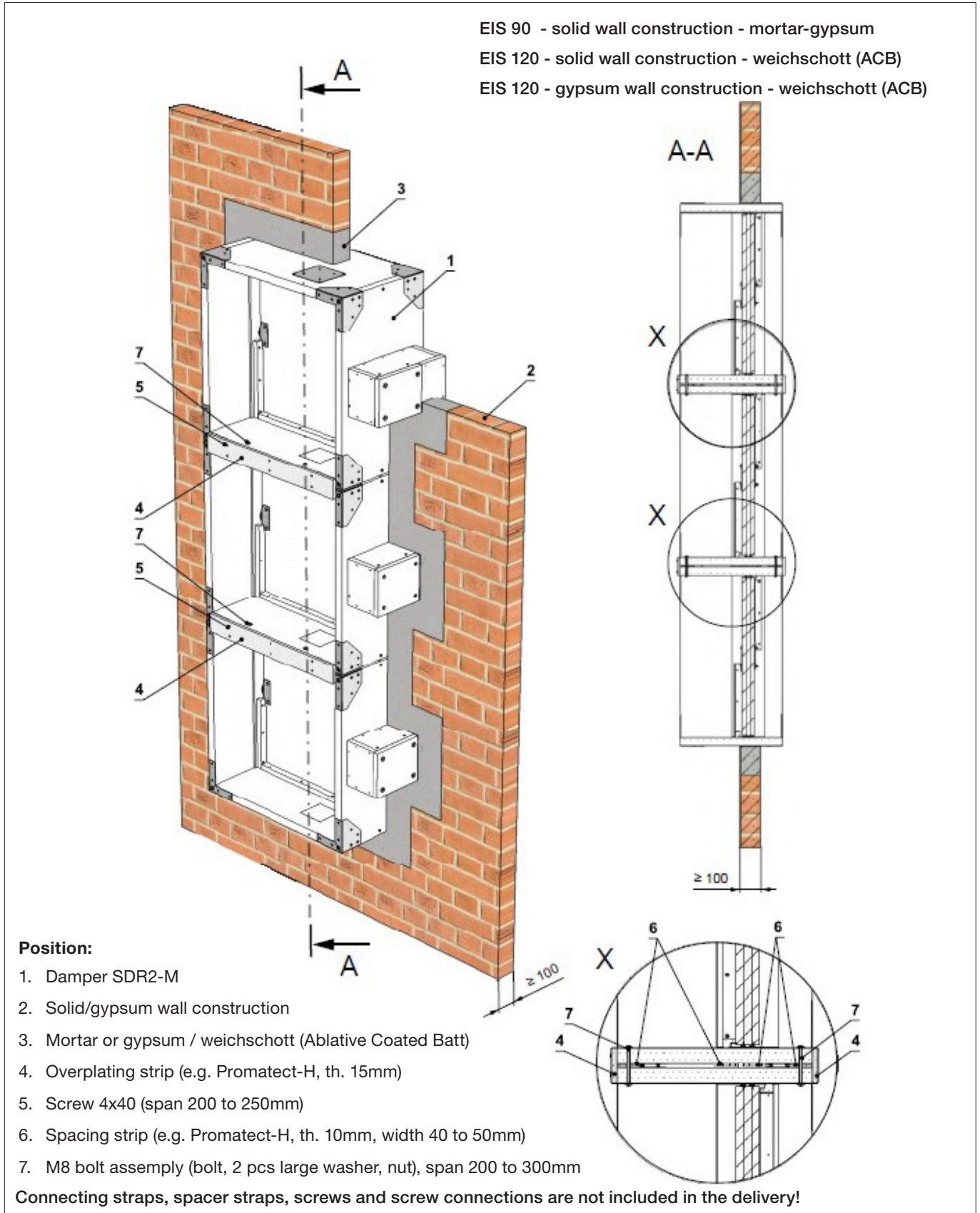
Fig. 44 4 dampers - solid / gypsum wall construction - mortar or gypsum / weichschott (Ablative Coated Batt)



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Fig. 45 3 dampers on top of each other - solid / gypsum wall construction - mortar or gypsum / weichschott (ACB)



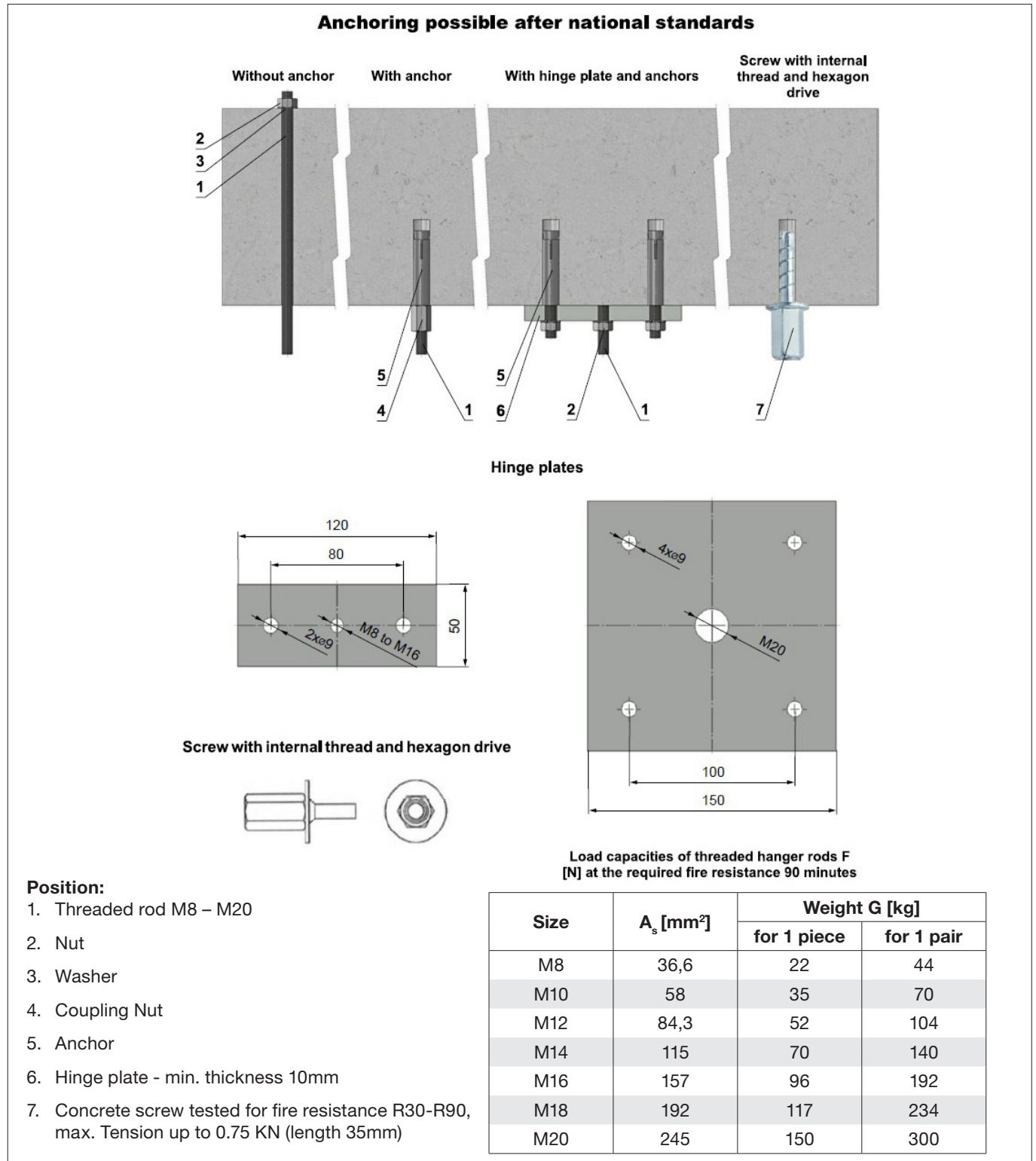
Smoke Control Damper

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5. Suspension systems

5.1. Mounting to the ceiling wall

Fig. 46 Mounting to the ceiling wall



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5.2. Examples of fixing

Dampers can be suspended by using of threaded rods and fixing rails. Threaded rods has to be designed depend on damper weight.

Damper suspension has to be solve separately. Back-to-back smoke exhaust duct has to be hung or supported so as all load transfer from the back-to-back smoke exhaust duct to the damper is absolutely excluded. Exhaust duct suspension has to be made according to recommendation of exhaust duct supplier.

Threaded rods longer than 1,5 m has to be protected by fire resistant insulation.

For fixing suspension system to solid ceiling has to be used only steel anchors with appropriate fire resistance or other suitable system.

Fig. 47 Examples of hinges fixing

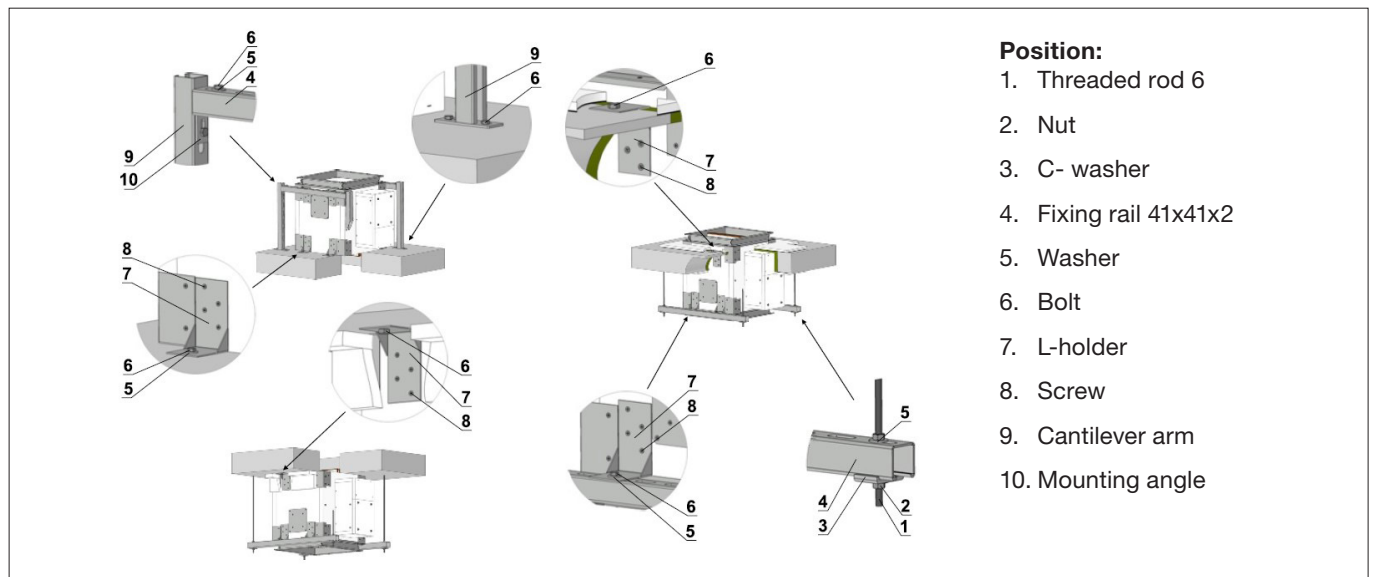
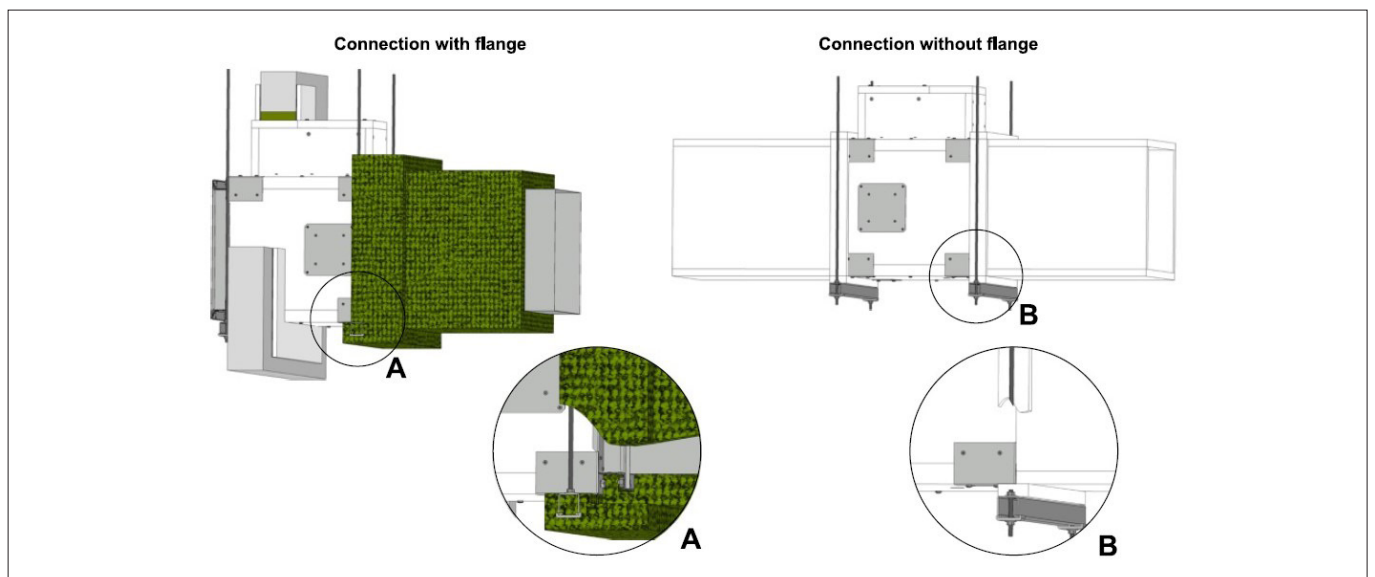


Fig. 48 Examples of damper connection to the duct



Smoke Control Damper

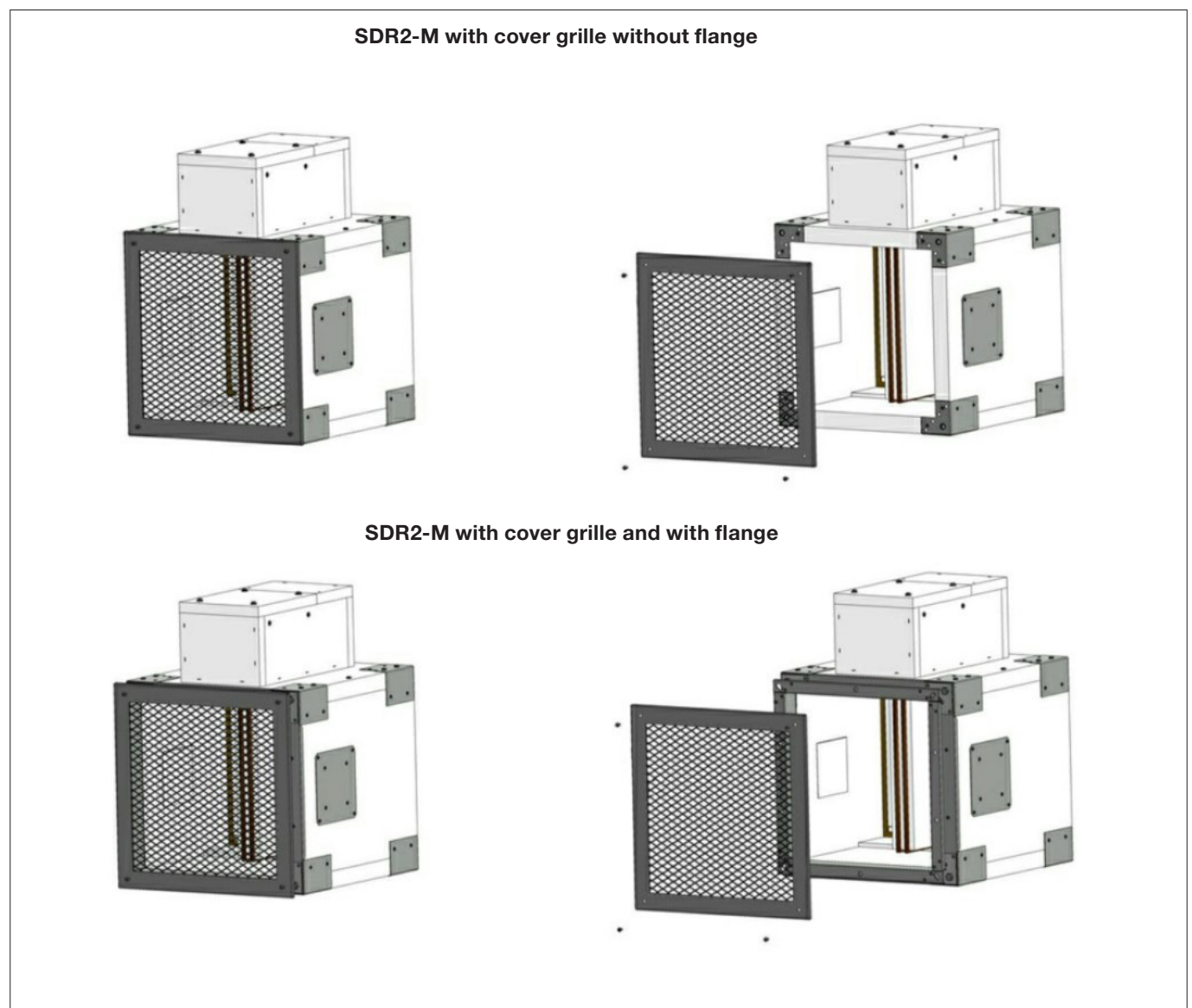
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Accessories

6. Cover grille

- The grilles type KMM can be used to close smoke control dampers.
- These grilles are available in all sizes of the smoke control dampers.

Fig.49 Cover grille KMM



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Technical data

7. Pressure loss

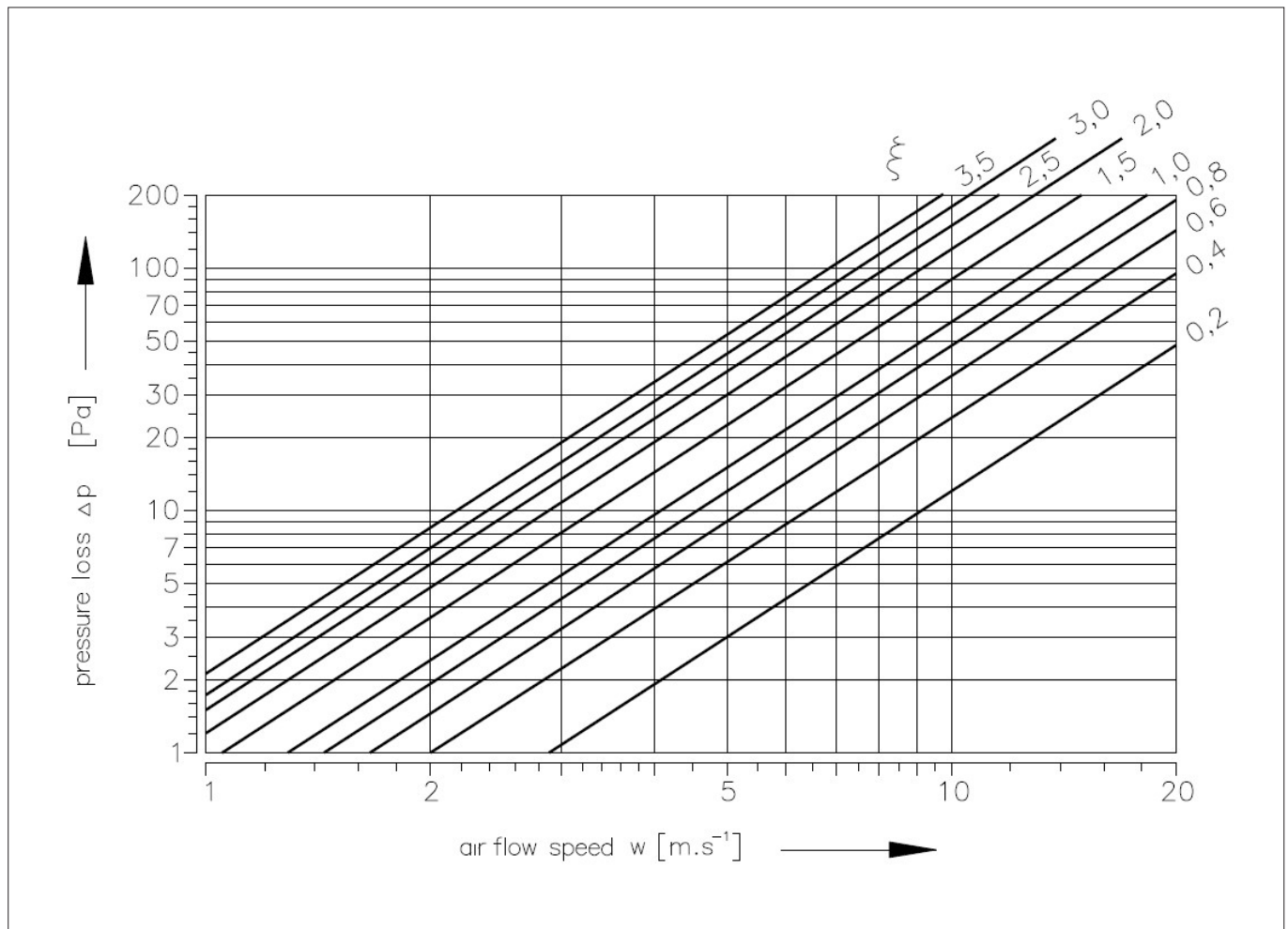
7.1. Pressure loss calculation

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

- Δp [Pa] pressure loss
- w [m.s⁻¹] air flow speed in nominal damper section
- ρ [kg.m⁻³] air density
- ξ [-] coefficient of local pressure loss for the nominal damper section (see Tab. 8.1.1.)

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

Diagram 7.2.1. Pressure losses for air density $\rho = 1,2 \text{ kg.m}^{-3}$



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8. Coefficient of local pressure loss

8.1. Coefficient of local pressure loss ξ (-)

Tab. 8.1.1. Coefficient of local pressure loss

A	B										
	180	200	225	250	280	300	315	355	400	450	500
180	3,1433	2,5092	2,0162	1,6711	1,4773	1,3192	1,1951	1,0336	0,9095	0,8126	0,7429
200	2,9529	2,3545	1,9584	1,5657	1,3991	1,2512	1,1186	0,9673	0,8500	0,7582	0,6919
225	2,7795	2,2032	1,8326	1,4909	1,3226	1,1594	1,0438	0,9231	0,8143	0,7157	0,6562
250	2,6401	2,1012	1,7204	1,3923	1,2172	1,0795	0,9911	0,8568	0,7514	0,6698	0,6120
280	2,5721	2,0417	1,6677	1,3413	1,1577	1,0506	0,9333	0,8313	0,7242	0,6375	0,5984
300	2,5075	1,9822	1,5725	1,2784	1,1373	1,0081	0,9078	0,8075	0,7055	0,6239	0,5627
315	2,4055	1,9108	1,5283	1,2376	1,0897	0,9843	0,8806	0,7752	0,6800	0,6052	0,5525
355	2,3103	1,8343	1,4552	1,2121	1,0676	0,9265	0,8602	0,7412	0,6511	0,5797	0,5287
400	2,2304	1,7697	1,3787	1,1679	1,0217	0,9044	0,8279	0,7140	0,6256	0,5576	0,5083
450	2,1607	1,7153	1,3413	1,1305	1,0013	0,8823	0,8007	0,6902	0,6052	0,5389	0,4913
500	2,1080	1,6711	1,3362	1,1016	0,9452	0,8483	0,7633	0,6715	0,5882	0,5236	0,4777
550	2,0723	1,6507	1,2971	1,0829	0,9231	0,8194	0,7514	0,6613	0,5797	0,5185	0,4726
560	2,0587	1,6320	1,2886	1,0744	0,9061	0,8211	0,7429	0,6545	0,5729	0,5100	0,4658
600	2,0247	1,6116	1,2801	1,0659	0,8959	0,8041	0,7327	0,6443	0,5627	0,5066	0,4590
630	2,0128	1,5946	1,2733	1,0489	0,8857	0,7871	0,7259	0,6392	0,5593	0,4981	0,4539
650	2,0043	1,5742	1,2546	1,0421	0,8687	0,7786	0,7225	0,6324	0,5559	0,4947	0,4505
700	1,9873	1,5674	1,2512	1,0319	0,8517	0,7701	0,7157	0,6290	0,5508	0,4913	0,4471
710	1,9720	1,5623	1,2274	1,0268	0,8534	0,7548	0,7089	0,6256	0,5474	0,4879	0,4437
750	1,9567	1,5419	1,2172	1,0183	0,8483	0,7497	0,6987	0,6188	0,5406	0,4845	0,4386
800	1,9380	1,5351	1,2087	1,0081	0,8432	0,7446	0,6953	0,6137	0,5372	0,4777	0,4352
900	1,9074	1,5096	1,2053	0,9911	0,8228	0,7259	0,6834	0,6035	0,5270	0,4692	0,4284
1000	1,8836	1,4909	1,2002	0,9792	0,7939	0,7106	0,6749	0,5950	0,5202	0,4641	0,4216
1100	1,8615	1,4739	1,1917	0,9673	0,7752	0,7004	0,6664	0,5865	0,5134	0,4573	0,4165
1250	1,8428	1,4569	1,1781	0,9554	0,7735	0,6987	0,6579	0,5814	0,5083	0,4522	0,4114
1400	1,8241	1,4433	1,1696	0,9469	0,7718	0,6970	0,6511	0,5746	0,5032	0,4471	0,4080
1500	1,8139	1,4348	1,1611	0,9418	0,7684	0,6936	0,6477	0,5712	0,4998	0,4454	0,4046
1600	1,8054	1,4280	1,1169	0,9367	0,7667	0,6902	0,6443	0,5678	0,4981	0,4420	0,4029

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Tab. 8.1.1. Coefficient of local pressure loss (continue)

A	B										
	550	560	600	630	650	700	710	750	800	900	1000
180	0,6987	0,6800	0,6477	0,6273	0,5984	0,5933	0,5831	0,5627	0,5474	0,5168	0,4947
200	0,6545	0,6341	0,6052	0,5848	0,5627	0,5525	0,5440	0,5304	0,5100	0,4828	0,4607
225	0,6188	0,5916	0,5712	0,5559	0,5355	0,5287	0,5134	0,5032	0,4777	0,4556	0,4318
250	0,5882	0,5610	0,5372	0,5168	0,4998	0,4913	0,4862	0,4726	0,4488	0,4335	0,4063
280	0,5559	0,5304	0,5151	0,4947	0,4828	0,4794	0,4726	0,4471	0,4301	0,4216	0,3927
300	0,5321	0,5202	0,4947	0,4743	0,4675	0,4624	0,4573	0,4267	0,4182	0,4029	0,3808
315	0,5134	0,5049	0,4692	0,4658	0,4471	0,4386	0,4318	0,4097	0,4046	0,3825	0,3655
355	0,4896	0,4828	0,4556	0,4454	0,4318	0,4216	0,4131	0,3961	0,3876	0,3655	0,3485
400	0,4743	0,4641	0,4471	0,4284	0,4182	0,4097	0,3978	0,3842	0,3723	0,3519	0,3349
450	0,4556	0,4488	0,4352	0,4131	0,4046	0,3927	0,3842	0,3757	0,3587	0,3383	0,3230
500	0,4505	0,4369	0,4182	0,4012	0,3876	0,3791	0,3723	0,3587	0,3485	0,3298	0,3145
550	0,4437	0,4267	0,4148	0,3978	0,3808	0,3757	0,3655	0,3519	0,3451	0,3247	0,3111
560	0,4386	0,4250	0,4097	0,3910	0,3757	0,3723	0,3638	0,3451	0,3400	0,3213	0,3060
600	0,4369	0,4199	0,3978	0,3876	0,3672	0,3638	0,3587	0,3434	0,3366	0,3162	0,3026
630	0,4301	0,4148	0,3927	0,3825	0,3621	0,3570	0,3536	0,3417	0,3315	0,3128	0,2992
650	0,4267	0,4097	0,3927	0,3808	0,3604	0,3553	0,3502	0,3400	0,3298	0,3111	0,2975
700	0,4250	0,4080	0,3859	0,3791	0,3587	0,3536	0,3485	0,3383	0,3281	0,3077	0,2941
710	0,4216	0,4063	0,3808	0,3740	0,3570	0,3502	0,3468	0,3349	0,3247	0,3060	0,2924
750	0,4199	0,4029	0,3757	0,3706	0,3553	0,3468	0,3434	0,3315	0,3213	0,3026	0,2873
800	0,4182	0,3978	0,3757	0,3655	0,3536	0,3451	0,3400	0,3281	0,3179	0,2992	0,2856
900	0,4148	0,3910	0,3757	0,3604	0,3519	0,3417	0,3332	0,3179	0,3128	0,2941	0,2805
1000	0,4012	0,3859	0,3706	0,3553	0,3502	0,3349	0,3281	0,3145	0,3077	0,2907	0,2771
1100	0,3927	0,3808	0,3587	0,3502	0,3417	0,3298	0,3247	0,3094	0,3043	0,2856	0,2737
1250	0,3876	0,3757	0,3536	0,3451	0,3383	0,3281	0,3213	0,3077	0,2992	0,2822	0,2703
1400	0,3825	0,3723	0,3502	0,3417	0,3332	0,3264	0,3179	0,3043	0,2975	0,2805	0,2669
1500	0,3791	0,3706	0,3485	0,3400	0,3298	0,3247	0,3162	0,3026	0,2958	0,2788	0,2652
1600	0,3774	0,3672	0,3451	0,3383	0,3264	0,3230	0,3145	0,2992	0,2941	0,2771	0,2635

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9. Noise data

9.1. Level of acoustic output corrected with filter A

Tab. 9.1.1. Level of acoustic output corrected with filter A

Air velocity 4 m/s																						
Level of acoustic output [dB]																						
A	B																					
	180	200	225	250	280	300	315	355	400	450	500	550	560	600	630	650	700	710	750	800	900	1000
180	56	49	48	46	44	42	41	41	40	40	40	40	40	40	40	40	38	38	37	38	38	
200	52	48	45	44	41	41	41	41	40	40	39	39	39	38	38	38	37	37	37	36	37	37
225	50	47	45	40	40	40	41	40	39	39	39	38	38	36	36	37	37	36	36	36	36	36
250	49	45	44	42	40	40	40	39	38	38	37	37	37	37	37	37	37	37	37	36	36	36
280	47	45	40	40	40	39	38	37	37	37	37	37	37	36	36	36	36	36	36	36	35	35
300	47	44	40	40	39	39	39	37	36	37	37	37	37	35	35	35	35	35	36	36	36	35
315	47	44	40	40	39	39	37	37	37	36	36	36	36	36	36	36	36	35	35	35	34	34
355	46	43	40	39	39	37	37	36	36	36	36	35	35	35	35	35	35	35	33	34	35	35
400	47	42	40	39	37	37	36	36	36	35	35	35	35	35	35	35	34	34	34	34	33	33
450	45	42	40	39	37	37	37	36	35	35	35	35	35	35	35	35	35	35	34	34	34	34
500	45	40	39	38	37	36	36	36	35	35	35	34	34	33	33	34	34	34	33	33	33	33
550	44	40	40	38	37	37	36	36	35	35	34	34	34	34	34	33	33	33	33	33	33	33
560	44	40	40	38	37	37	36	35	35	35	34	34	34	34	34	33	33	33	33	33	33	33
600	44	40	38	36	36	36	36	36	35	35	35	35	35	33	33	33	33	32	32	32	32	32
630	44	40	38	37	36	36	36	35	35	35	34	34	34	34	34	33	33	33	33	32	32	32
650	44	40	38	37	36	36	36	35	35	35	34	34	34	34	34	33	33	33	33	33	33	33
700	43	39	38	38	36	36	36	37	35	36	34	34	34	34	34	33	33	33	33	33	33	33
710	43	39	38	38	36	36	36	37	35	36	34	34	34	34	34	33	33	33	33	33	33	33
750	43	40	38	37	36	35	35	34	34	34	34	34	33	33	33	33	33	33	33	33	33	33
800	43	40	37	37	36	36	35	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33
900	43	40	37	36	36	36	35	34	34	34	34	33	33	33	33	33	33	33	33	33	33	33
1000	43	39	37	37	37	36	35	35	34	34	34	33	33	33	33	33	33	33	33	33	33	33
1100	42	39	37	37	37	35	35	34	34	34	33	33	33	33	33	33	33	32	32	32	32	32
1250	42	39	37	37	37	35	35	34	34	34	34	33	33	33	33	33	33	32	32	32	32	32
1400	42	39	37	37	37	35	35	34	34	34	33	33	33	33	33	33	33	32	32	32	32	31
1500	42	39	37	37	37	35	35	34	34	34	33	33	33	33	33	33	33	32	32	32	32	31
1600	42	39	37	37	37	35	35	34	34	34	33	33	33	33	33	33	33	32	32	32	32	31

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Tab. 9.1.2. Level of acoustic output corrected with filter A

Air velocity 5 m/s																						
Level of acoustic output [dB]																						
A	B																					
	180	200	225	250	280	300	315	355	400	450	500	550	560	600	630	650	700	710	750	800	900	1000
180	>55	55	53	52	49	47	48	47	47	47	46	46	46	46	45	45	45	45	45	45	45	45
200	>55	55	52	49	48	48	47	47	47	45	45	45	44	44	44	44	45	45	45	45	45	45
225	>55	54	50	48	47	47	47	45	44	44	44	44	44	44	44	44	44	44	44	44	44	43
250	>55	52	49	48	47	46	46	44	44	44	44	44	44	44	43	43	43	43	43	43	43	43
280	54	50	49	47	46	45	45	44	44	44	43	43	43	43	42	42	42	42	42	42	42	42
300	54	49	47	46	45	45	44	44	43	43	43	43	43	42	42	42	42	41	42	42	42	41
315	54	51	48	47	45	45	44	44	44	43	43	42	42	41	41	41	41	41	41	41	41	41
355	54	50	48	45	44	43	43	43	42	42	42	41	41	41	41	41	41	41	41	41	40	40
400	54	49	46	45	43	43	43	43	42	42	41	40	40	40	40	40	40	40	40	40	40	40
450	52	47	46	43	42	42	42	41	41	40	40	40	40	40	40	40	40	40	40	39	39	39
500	51	48	46	44	43	43	43	41	41	40	40	40	40	40	40	40	40	39	39	39	39	39
550	49	47	46	44	43	43	42	41	40	40	40	40	40	40	39	39	39	39	39	39	39	38
560	49	47	46	44	43	43	42	41	40	40	40	40	40	40	39	39	39	39	39	39	39	38
600	50	47	45	43	43	42	42	41	40	40	40	40	40	40	39	39	39	39	39	38	38	38
630	50	48	45	43	43	42	42	41	40	40	40	40	40	40	40	40	40	40	38	38	38	38
650	50	48	45	43	42	42	42	41	40	40	40	40	39	39	39	39	39	38	38	38	38	38
700	50	48	45	42	42	42	42	41	40	40	40	40	39	39	39	39	39	38	38	38	38	38
710	50	48	45	42	42	42	42	41	40	40	40	40	39	39	39	39	39	38	38	38	38	38
750	50	47	45	42	42	42	42	41	40	40	40	40	39	39	39	39	39	38	38	38	38	38
800	50	47	45	42	42	42	42	41	40	40	40	40	39	39	39	39	39	38	38	38	38	38
900	49	47	44	42	42	42	41	40	40	40	40	39	39	39	39	39	38	38	38	38	38	38
1000	49	47	43	42	42	42	40	40	40	40	40	39	39	39	39	38	38	38	38	38	38	38
1100	49	47	43	42	42	42	40	40	40	40	40	39	39	39	39	38	38	38	38	38	38	38
1250	49	47	43	42	42	42	40	40	40	40	39	39	39	39	38	38	38	38	38	38	38	38
1400	48	46	43	42	42	41	40	40	40	39	38	38	38	38	38	38	38	38	38	38	38	37
1500	48	46	43	42	41	41	40	40	40	39	38	38	38	38	38	38	38	38	38	38	38	37
1600	48	46	43	42	41	41	40	40	40	39	38	38	38	38	38	38	38	38	38	38	38	37

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Tab. 9.1.3. Level of acoustic output corrected with filter A

Air velocity 6 m/s																						
Level of acoustic output [dB]																						
A	B																					
	180	200	225	250	280	300	315	355	400	450	500	550	560	600	630	650	700	710	750	800	900	1000
180	>55	>55	>55	>55	55	54	54	54	54	52	52	52	52	52	52	52	52	52	51	51	51	51
200	>55	>55	>55	55	54	54	53	53	52	51	50	50	50	50	50	50	50	50	50	50	50	48
225	>55	>55	>55	54	52	52	52	51	50	50	49	48	48	48	48	48	48	48	48	48	47	47
250	>55	>55	55	53	52	52	51	50	50	49	48	48	48	47	47	47	47	47	47	47	47	47
280	>55	>55	54	52	51	50	50	49	48	48	48	47	46	46	46	46	46	46	46	46	46	46
300	>55	>55	54	52	50	50	50	48	47	47	46	46	46	46	46	46	46	46	46	46	47	45
315	>55	55	53	52	50	49	50	48	47	46	46	46	46	46	46	46	46	46	47	47	46	46
355	>55	55	53	51	50	49	48	47	47	46	46	46	46	46	46	46	46	46	46	46	46	46
400	>55	54	52	50	49	48	48	47	45	45	45	45	45	45	45	45	45	45	45	45	45	45
450	>55	54	51	50	48	48	47	46	45	45	45	45	45	45	45	45	45	45	45	45	45	45
500	55	54	51	49	48	48	47	45	45	45	45	45	45	45	45	45	45	45	45	45	43	43
550	55	53	50	50	48	47	45	45	45	45	45	45	45	45	45	45	45	45	45	44	44	44
560	55	53	50	50	48	47	45	45	45	45	45	45	45	45	45	45	45	45	45	44	44	44
600	55	53	50	50	48	47	45	45	45	45	45	45	45	44	44	44	44	44	44	44	44	44
630	55	53	50	49	48	47	45	45	45	45	45	45	44	44	44	44	44	44	44	44	44	44
650	55	52	50	49	48	47	45	45	45	45	45	45	44	44	44	44	44	44	43	43	43	43
700	55	52	50	48	48	46	46	45	45	45	45	45	44	44	44	44	44	44	43	43	43	43
710	55	52	50	48	48	46	46	45	45	45	45	45	44	44	44	44	44	44	43	43	43	43
750	55	52	50	48	48	46	45	45	45	45	45	45	44	44	44	44	44	44	43	43	43	43
800	55	52	50	48	48	46	45	45	45	45	45	45	44	44	44	44	43	43	43	43	43	43
900	55	52	49	48	47	45	45	45	45	45	45	44	43	43	43	43	43	43	43	43	43	43
1000	55	52	49	48	47	45	45	45	45	45	44	44	44	43	43	43	43	43	43	43	43	43
1100	54	52	49	48	46	45	45	45	45	44	44	44	44	43	43	43	43	43	43	43	43	43
1250	54	52	49	47	45	45	45	45	45	44	44	44	44	43	43	43	43	43	43	43	43	43
1400	54	52	48	48	46	44	44	44	45	44	43	43	43	43	43	43	43	43	43	43	43	42
1500	54	52	48	48	45	44	44	44	45	44	43	43	43	43	43	43	43	43	43	43	42	42
1600	54	52	48	48	45	44	44	45	45	45	43	43	43	43	43	43	43	43	43	42	42	42

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Tab. 9.1.4. Level of acoustic output corrected with filter A

Air velocity 7 m/s																						
Level of acoustic output [dB]																						
A	B																					
	180	200	225	250	280	300	315	355	400	450	500	550	560	600	630	650	700	710	750	800	900	1000
180	>61	>61	>61	>61	61	60	60	58	58	57	56	56	56	55	55	55	55	55	55	56	55	55
200	>61	>61	>61	>61	59	58	58	57	56	55	55	55	55	55	55	55	55	54	54	54	54	54
225	>61	>61	>61	60	57	56	56	55	55	55	54	54	53	53	53	53	53	53	53	53	53	53
250	>61	>61	>61	58	56	56	56	55	54	53	53	53	53	53	52	52	52	52	52	53	52	52
280	>61	>61	60	57	56	55	55	54	53	52	52	52	51	51	51	51	51	51	51	51	50	50
300	>61	61	58	57	55	54	54	53	53	52	52	52	52	52	52	50	50	50	50	50	50	50
315	>61	61	57	56	55	55	54	53	52	52	51	51	51	51	50	50	50	50	50	49	49	49
355	>61	61	57	55	54	53	53	52	52	52	51	50	50	50	50	49	49	49	49	48	48	48
400	>61	60	57	55	53	53	53	52	51	51	49	49	49	49	49	48	48	48	48	48	48	48
450	>61	59	56	54	52	52	52	51	50	50	50	48	48	48	48	48	48	48	48	48	48	48
500	60	58	55	54	53	52	52	50	50	50	48	48	48	48	48	48	48	48	48	48	48	48
550	60	58	55	54	53	52	52	50	50	48	48	48	48	48	48	48	48	48	48	48	48	48
560	60	58	55	54	53	52	52	50	50	48	48	48	48	48	48	48	48	48	48	48	48	48
600	60	58	55	54	52	52	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
630	60	58	55	53	51	51	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
650	60	58	55	53	52	51	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
700	59	58	55	53	52	51	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
710	59	58	55	53	52	51	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
750	59	58	55	53	52	51	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
800	59	58	55	53	52	51	51	50	49	48	48	48	48	48	48	48	48	48	48	48	48	48
900	58	56	53	53	52	50	50	48	48	47	48	48	48	48	48	48	48	48	48	48	47	47
1000	58	56	53	53	51	50	50	48	48	48	48	48	48	48	48	48	48	48	48	48	47	47
1100	58	56	53	53	51	50	50	48	48	48	48	48	48	48	48	48	48	48	48	47	47	47
1250	58	56	53	53	51	50	50	48	48	48	48	48	48	48	48	48	48	48	48	47	47	47
1400	58	56	53	52	51	50	48	48	47	47	47	47	47	47	47	47	47	47	47	47	47	46
1500	58	56	53	52	51	50	50	48	47	47	47	47	47	47	47	47	47	47	47	47	47	46
1600	58	56	53	52	51	50	50	48	47	47	47	47	47	47	47	47	47	47	47	47	47	46

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Tab. 9.1.5. Level of acoustic output corrected with filter A

Air velocity 8 m/s																						
Level of acoustic output [dB]																						
A	B																					
	180	200	225	250	280	300	315	355	400	450	500	550	560	600	630	650	700	710	750	800	900	1000
180	>63	>63	>63	>63	>63	>63	>63	63	62	61	61	60	60	60	60	60	60	60	60	60	60	59
200	>63	>63	>63	>63	>63	62	62	61	60	60	60	60	60	60	60	60	60	60	59	59	59	58
225	>63	>63	>63	>63	>63	61	61	60	60	58	58	58	58	58	58	58	58	58	58	57	57	57
250	>63	>63	>63	>63	61	60	60	59	58	58	57	57	57	57	57	57	57	57	56	56	56	56
280	>63	>63	>63	>63	59	59	59	58	58	57	57	56	56	56	56	56	56	56	56	55	55	54
300	>63	>63	62	61	59	59	59	58	57	56	56	55	55	55	55	55	55	55	55	54	54	54
315	>63	>63	62	61	59	59	58	57	57	56	55	55	55	55	55	55	55	55	55	55	54	54
355	>63	>63	63	59	58	58	57	56	55	55	54	54	54	54	54	54	53	53	53	53	53	53
400	>63	63	62	60	58	57	56	56	55	54	54	54	54	54	54	54	53	53	53	53	52	52
450	>63	63	60	58	57	56	56	55	55	55	54	53	53	53	53	53	53	53	53	53	52	52
500	>63	62	60	58	56	55	55	54	54	54	53	53	53	53	53	53	53	53	53	52	51	51
550	>63	62	59	58	56	56	55	55	54	53	53	53	53	53	53	53	53	53	52	52	51	51
560	>63	62	59	58	56	56	55	55	54	53	53	53	53	53	53	53	53	53	52	52	51	51
600	>63	62	59	58	56	55	55	54	54	53	53	53	53	53	52	52	52	51	51	51	50	50
630	>63	62	59	58	56	55	55	54	54	53	53	53	53	53	52	52	52	51	50	50	50	50
650	>63	61	59	58	56	55	55	54	54	53	53	53	52	51	51	51	51	51	50	50	50	50
700	63	62	59	57	56	55	55	54	54	53	53	53	52	51	51	50	50	50	50	50	49	49
710	63	62	59	57	56	55	55	54	54	53	53	53	52	51	51	50	50	50	50	50	49	49
750	63	62	59	57	56	55	55	54	54	53	52	52	52	52	51	50	50	50	50	50	50	49
800	62	60	57	57	56	55	54	54	54	52	52	52	52	51	51	50	50	50	50	50	50	49
900	62	60	57	56	55	55	54	53	53	52	52	51	51	51	50	50	50	50	50	50	50	50
1000	62	60	57	56	56	55	54	53	53	52	52	51	51	51	50	50	50	50	50	50	50	50
1100	62	60	57	56	56	55	54	53	53	52	51	51	51	50	50	50	50	50	50	50	50	50
1250	62	61	58	56	56	54	54	53	53	52	50	50	50	50	50	50	49	49	49	49	49	49
1400	62	61	57	56	56	53	54	53	53	50	50	50	50	50	50	50	49	49	49	49	49	49
1500	62	61	57	56	56	54	54	53	52	50	50	50	50	50	50	50	49	49	49	49	49	49
1600	62	61	57	56	56	54	54	53	52	50	50	50	50	50	50	50	49	49	49	49	49	49

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Tab. 9.1.6. Level of acoustic output corrected with filter A

Air velocity 9 m/s																						
Level of acoustic output [dB]																						
A	B																					
	180	200	225	250	280	300	315	355	400	450	500	550	560	600	630	650	700	710	750	800	900	1000
180	>65	>65	>65	>65	>65	>65	>65	>65	>65	65	64	64	64	64	64	64	64	64	64	63	63	63
200	>65	>65	>65	>65	>65	>65	>65	65	64	64	63	63	63	62	62	62	62	62	62	62	61	61
225	>65	>65	>65	>65	>65	>65	65	63	63	62	61	61	61	61	61	61	61	61	61	61	60	60
250	>65	>65	>65	>65	>65	65	65	63	62	61	60	60	60	60	60	60	60	60	60	60	60	60
280	>65	>65	>65	>65	64	63	62	61	61	60	60	60	60	59	59	59	59	59	59	59	58	58
300	>65	>65	>65	65	63	62	62	61	60	60	60	60	60	60	60	59	59	59	59	59	59	59
315	>65	>65	>65	64	63	62	61	61	60	60	60	60	60	59	59	59	59	59	59	59	59	58
355	>65	>65	>65	64	62	61	60	60	60	60	60	59	59	59	59	58	58	58	58	58	58	58
400	>65	>65	>65	63	61	60	60	59	58	58	58	58	58	58	58	58	58	58	58	57	57	57
450	>65	>65	65	63	60	60	60	59	58	58	58	57	57	57	57	57	57	57	57	56	56	56
500	>65	>65	64	61	60	60	60	59	58	57	57	57	57	57	56	56	56	56	56	56	55	55
550	>65	>65	62	62	60	60	58	57	58	58	57	57	57	56	56	56	56	56	56	56	55	55
560	>65	>65	62	62	60	60	58	57	58	58	57	57	57	56	56	56	56	56	56	56	55	55
600	>65	>65	62	62	60	59	58	58	58	57	56	56	56	56	56	56	55	55	55	55	55	55
630	>65	>65	62	62	60	59	58	58	58	57	56	56	56	56	56	56	55	55	55	55	55	55
650	>65	>65	62	62	59	59	58	58	58	57	56	56	56	56	56	56	55	55	55	55	55	55
700	>65	>65	62	61	59	59	58	58	57	56	55	55	55	55	55	55	55	55	55	55	55	54
710	>65	>65	62	61	59	59	58	58	57	56	55	55	55	55	55	55	55	55	55	55	55	54
750	>65	>65	62	61	59	59	58	57	57	56	55	55	55	55	55	55	55	55	55	55	55	55
800	>65	64	62	61	59	59	58	57	57	56	55	55	55	55	55	55	55	55	55	55	54	54
900	>65	64	62	60	60	59	58	57	57	55	55	55	55	55	55	55	54	55	55	55	54	54
1000	>65	64	60	60	58	58	58	57	57	55	55	55	55	55	55	55	55	55	55	55	54	54
1100	>65	64	60	59	58	58	57	57	57	55	55	55	55	55	55	55	55	55	55	55	54	54
1250	>65	64	60	59	58	58	57	57	56	55	55	55	55	55	54	54	54	54	54	54	54	53
1400	>65	64	61	60	58	58	57	57	56	56	55	55	55	55	55	54	54	54	54	54	53	53
1500	>65	64	60	60	58	58	56	56	56	56	55	55	55	55	55	54	54	54	53	53	53	53
1600	>65	64	60	60	58	58	56	56	56	56	55	55	55	55	55	54	54	54	53	53	53	53

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Material, finishing

10. Material

10.1. Damper casings and blades are made of fire resistant asbestos free boards made of mineral fibres. Fasteners are galvanized.

10.2. 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 – EN17240)
- Class A4 – Chemistry-grade stainless steel (AISI 316, 316L – EN17346, 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 three Promatect-H sheets, thickness 20 mm, connected with galvanised nailed “U” connectors which are sealed with Promat K84 from the outside.

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.

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

11. Inspection, testing

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

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12. Logistic terms

12.1. Dampers are delivered on a pallets. 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.

12.2. For unloading and further manipulation with the damper is necessary to use appropriate tooling (forklifts) due to damper weight. Dampers are fragile.

12.3. Dampers are transported by boxfreight vehicles without direct weather impact, there must not occur any shocks and ambient temperature must not exceed +50°C. Dampers must be protected against mechanic damages when transported and manipulated. During transportation, the damper blade must be in the "CLOSED" position.

12.4. 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 mechanic damages when transported and manipulated.

Assembly, attendance, maintenance and revisions

13. Assembly

13.1. 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 fire dampers must be done according international and local norms and laws.

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

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

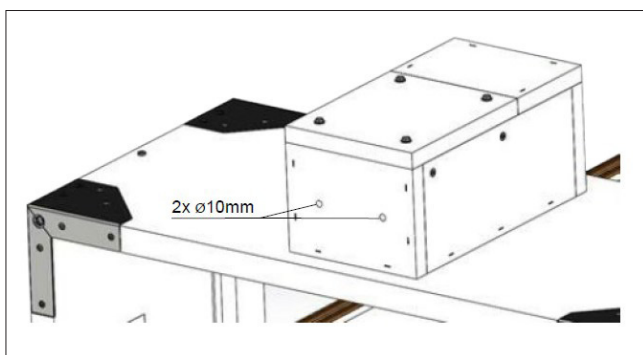
13.4. Manual operation

Without power supply, the damper can be operated manually and fixed in any required position.

13.5. For electrical connection of the actuator use the prefabricated slot in the protection box on the top side of the box.

13.6. If it is necessary to use other position of the connecting holes, then make two holes to the protection box to pull in connecting cables (heat resistant cables) to the cables of damper's actuator. Protection box is made of calcium silicate plates.

Fig. 50 Connecting holes



Procedure

- use drill $\varnothing 10$ and make two holes (see fig. 50). It is possible to make 2 holes in any wall of the box.
- pull the heat resistant cable through the calcium silicate plate (wall) and connect with cables from actuator according to above mentioned electrical diagram.
- seal up the space in the wall with fire resistant mastic or sealant
- let the sealant harden

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14. Entry into service and revisions

14.1. 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.

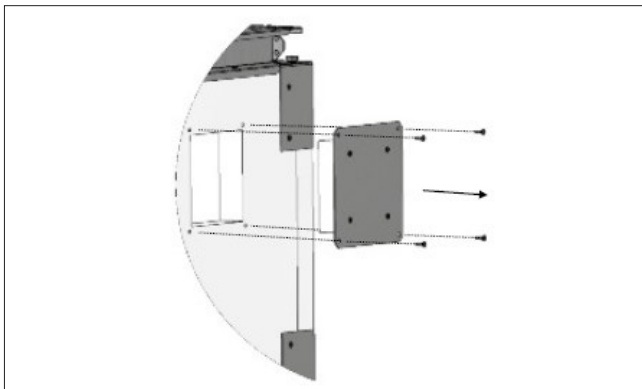
Results of regular checks, imperfections found and all-important facts connected with the damper function must be recorded in the "FIRE BOOK" and immediately reported to the operator.

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

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

Inspection hole disassembly: release the covering lid by unscrewing four outer screws than remove it from its original position.

Fig. 51 Inspection hole detail



Check of damper blade displacement can be realized after actuating mechanism supply connection or signal connection from higher level control systems. Blade displacement from position "OPEN" to position "CLOSED" and return displacement is checked

15. Spare parts

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

Smoke Control Damper

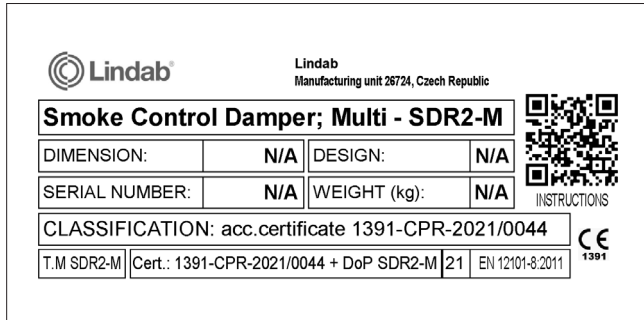
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Product data

16. Nameplate

16.1. Nameplate is placed on the damper casing

Fig. 52 Nameplate



Ordering information

17. Ordering example

	SDR2-M	200	200	230V	Yes	Yes
Product						
Width						
Height						
Actuator						
BKN Module						
Flanges						

Example: SDR2-M-200-200-230V-BKN-Flanges



Good Thinking

At Lindab, good thinking is a philosophy that guides us in everything we do. We have made it our mission to create a healthy indoor climate – and to simplify the construction of sustainable buildings. We do that by designing innovative products and solutions that are easy to use, as well as offering efficient availability and logistics. We are also working on ways to reduce our impact on our environment and climate. We do that by developing methods to produce our solutions using a minimum of energy and natural resources, and by reducing negative effects on the environment. We use steel in our products. It's one of few materials that can be recycled an infinite number of times without losing any of its properties. That means less carbon emissions in nature and less energy wasted.

We simplify construction

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