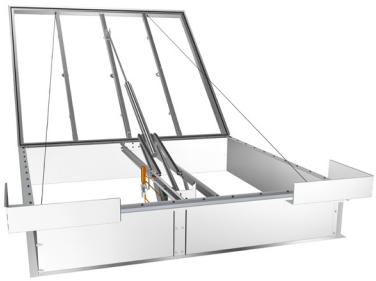
SCD
SMOKE DAMPERS



Intended use:
Smoke dampers can perform three functions:
1. Extraction of smoke and toxic gases during a fire;
2. Additional room illumination;
3. Temporary facility ventilation.

Certificate of Constancy of Performance No. 1438-CPR-0503, specified in PN-EN 12101-2:2005, is a legal basis for using SCD smoke dampers.

Intended Use and Product Classification

SCD smoke dampers are used in public buildings, warehouses, production facilities etc. They are designed for mounting onto flat roofs slanted at not more than 15°.

The main function of SCD smoke dampers is extracting smoke and hot toxic gases occurring during fire in the under-ceiling space.

SCD smoke dampers by Smay Sp. z o. o. have openable covers filled with translucent material. **Therefore, they additionally function as roof skylights.**

The third function of SCDs, when appropriate tooling is used, is **cyclic ventilation**.

In each and every case smoke extraction is the priority function of SCD smoke dampers. SCDs make it possible to evacuate people and enable rescue services to undertake appropriate intervention by keeping the lower areas of a building, including escape routes, free of smoke. Smoke dampers reduce the thermal load of the building structure by reconducting the heat created during a fire, and thus reducing material injury caused by the fire.

Using SCD smoke dampers gives the possibility of lowering the building fire protection class, enlarge permissible fire zones and lengthen escape routes.

SCD smoke dampers are classified according to PN-EN 12101-2 criteria, with regard to the following areas:

- Reliability: double action, **Re 1000**,
- Snow load: **SL550 – SL1000** (depending on the drive size and type),
- Low temperature: **T(00) – T(-25)** (depending on the drive size and type),
- Wind load: **WL 1500**,
- Resistance to high temperature: **B 300**.

Single leaf damper effective areas are presented in Table 10, and double leaf damper active areas – in Table 11 (the last pages of this document).

It is possible to make the dampers in the version meeting the requirements of the B_{ROOF} (t_1) classification.

The properties specific to the skylight function are declared according to EN-1873:2014+A1:2016.

Technical Description of Products

SCD smoke dampers are rectangular in cross-section. They are available as single or double leaf.

The opening angle of the single leaf damper is not less than 140°. The opening angle of the double leaf damper is not less than 90°.

The SCD leaves are connected by means of a hinge with a straight or sloping base made of zinc-plated sheet. The hinge is protected against unwanted impurities by means of an aluminium cover.

The base is adapted for placing insulation material on its entire perimeter. It is recommended to use mineral wool insulation, 50 mm thick. The insulation material should be of A1 reaction-to-fire class and be characterised by high density (150 kg/m³ minimum) and thermal insulation power (thermal resistance Ri = 1.25 m²·K/W minimum). Heat-transfer coefficient for the base insulated by means of mineral wool, as described above, 50 mm thick, is U = 0.80 [W/m²K].

Moisture tightness is obtained by means of applying insulation with bituminous materials or sheet-metal work, appropriate for the given roof structure.

The leaf frame is a one-piece item made of a specially designed aluminium profile, which makes it possible to mount porous polycarbonate cover 10, 16, 20 or 25 mm thick.

In the basic version Lexan LT2UV169X Opal White polycarbonate plate, 16 mm thick, is used. Important properties of this material are presented in Table 1.

FIRE VENTILATION ZONE

Certificate of Constancy of Performance No. 1438-CPR-0503/W according to PN-EN 12101-2: 2005.

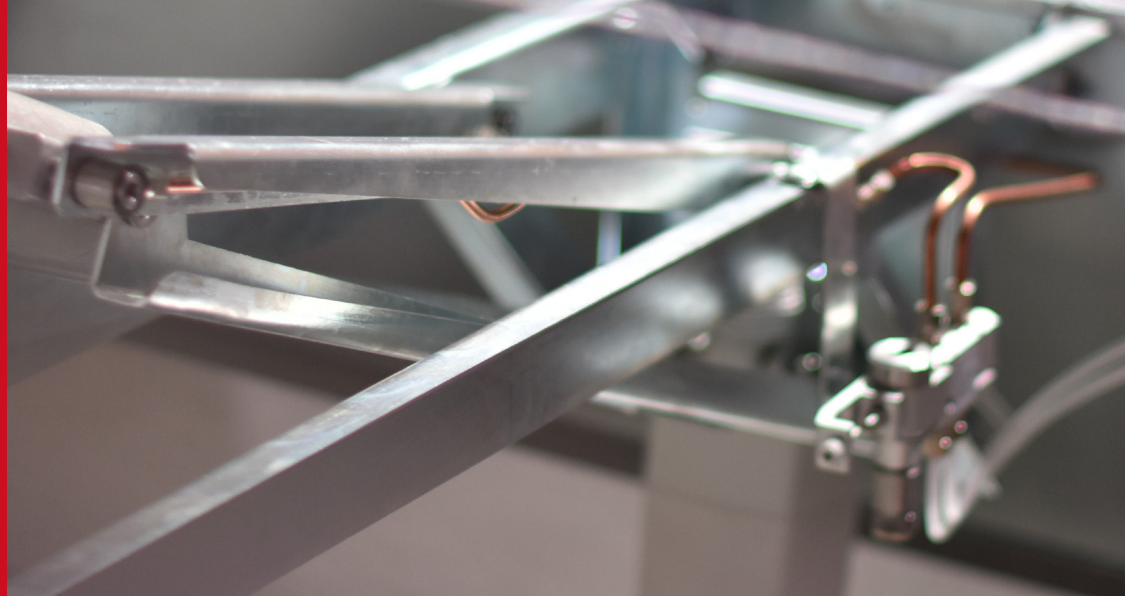


Table 1. Polycarbonate parameters.

Grade-Color	Gauge [mm]	Weight (kg/m³)	Sound Red. Value [dB]	U-Value [W/m² K]	Hail Impact Test [m/sec]	LT D65 [%LT]	DST [DST]	TST [%TST}	SHGC	LSGR	SC
LT2UV105R175 Clear	10	1.75	20	2.39	>21	65	61	62	0.62	1.05	0.72
Opal White	10	1.75	20	2.39	>21	60	58	59	0.59	1.02	0.68
SC IR Green	10	1.75	20	2.39	>21	48	34	48	0.48	1,08	0.56
LT2UV169X Clear	16	2,5	21	1,77	>21	54	51	54	0,54	1,00	0,62
Opal White	16	2,5	21	1,77	>21	47	45	49	0,49	0,96	0,56
S.C. IR Green	16	2,5	21	1,77	>21	38	25	39	0,39	0,97	0,44
LT2UV209X Clear	20	2.8	21	1.59	>21	53	50	53	0.53	1.00	0.61
Opal White	20	2.8	21	1.59	>21	47	46	50	0.50	0.94	0.57
SC IR Green	20	2.8	21	1.59	>21	37	25	39	0.39	0.95	0.44
LTUV259X Clear	25	3.0	22	1.40	>21	51	49	52	0.52	0.98	0.60
Opal White	25	3.0	22	1.40	>21	44	42	47	0.47	0.94	0.54
SC IR Green	25	3.0	22	1.40	>21	36	23	37	0.37	0.97	0.42

Explanations for the parameters presented in Table 1 are given in the original Manufacturer's notation.
Light Transmission D65 (% LT) - Percentage of the incident visible light that passes through an object.
Direct Solar Transmission (%DST) - Percentage of incident solar radiation that passes directly through an object.
Total Solar Transmission (%TST) - The percentage of incident Solar radiation transmitted by an object which includes the direct Solar Transmission plus the part of the Solar Absorption reradiated inward.
Solar Heat Gain Coefficient (SHGC) - or g-value is the total solar energy that enters the interior of a building, divided by 100.
Shading Coefficient (SC) - The ratio of the total solar radiation transmitted by a given material to that transmitted by normal 3 mm glass, whose light transmission is 87%. SC=%TST/87.
Light to Solar Gain Ratio (LSGR) - The ratio between total light transmission (LT) and the total solar transmission (TST).

The contact between the polycarbonate plate and the cover profile is sealed by means of a EPDM profile gasket.

The airtightness is obtained by means of using a EPDM gasket mounted between the cover and drainpipe profiles.

The aluminium profile shapes and dimensions are patented.

The whole damper is made with the use of mounting technologies, which may be used both in a production plant and at a stand prepared at a building site, or directly on the building roof. The dampers may be delivered as an easy-to-transport set of ideally matched parts, with all the connecting members needed.

The mounting procedure takes place on the basis of a clearly presented manual, by means of standard fitting tools, without the need to use a welding torch or a grinding machine.

It is possible to deliver assembled dampers (thermal trips, deflectors and – optionally – actuators are always delivered separately). In this case individual arrangements for mounting preparation and insulation are needed.

Controls, such as AK alarm boxes, PLZ alarm-ventilation boxes, RWZ smoke control panels, WRS weather control panels and OSD63 smoke detectors are delivered together with the manufacturer's instruction manuals. Installation companies and users are obliged to read these documents and to apply all regulations set therein.

Smoke Dampers with the SCD-1-W Roof Hatch Function

Smoke dampers with the roof hatch function, besides all functions of standard dampers, also enable workers to get on the roof. They are made with a straight base only, in two versions:

- Version 1 – with a single electric actuator – for dimensions 1000 x 1000 and 1000 x 1200,
- Version 2 – with two electric actuators – within the range from 1000 x 1300 to 1800 x 1800.

Their detailed description is presented on page 12.

SCD-1... Single Leaf Dampers – Dimensions

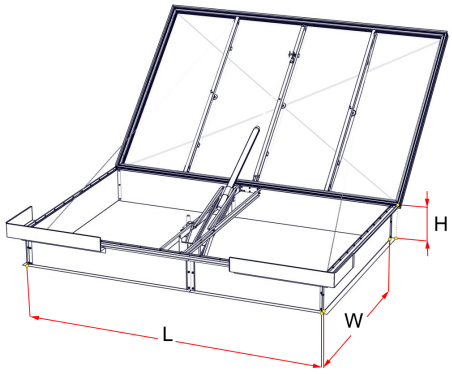


Figure 1. SCD-1-P... single leaf damper on a straight base.

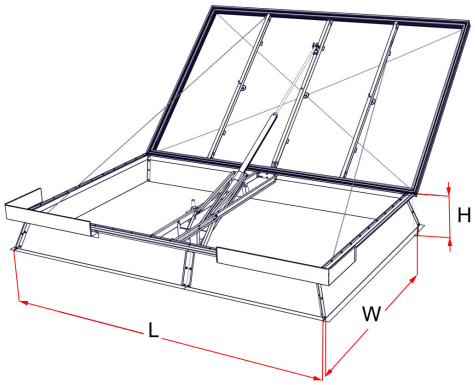


Figure 2. SCD-1-S... single leaf damper on a sloping base.

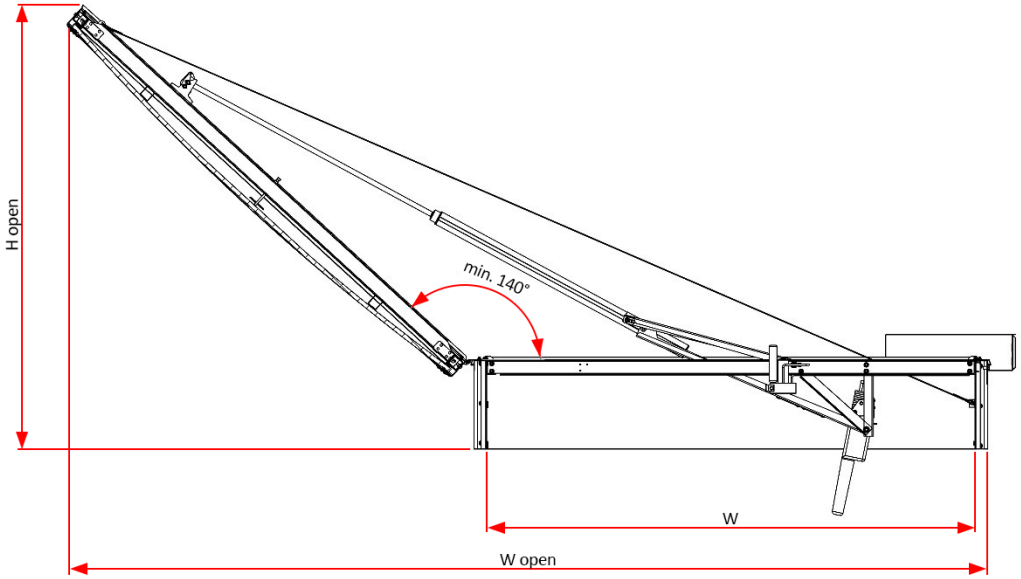


Figure 3. SCD-1-P... single leaf damper in open position.

The distinctive dimensions of SCD-1... dampers are shown in Table 2.

Table 2. Distinctive dimensions of SCD-1... dampers.

Pos.	Nominal size		Dimensions in open position		Geometric area A_v[m²]	Cover weight [N]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
1	1000	1000	1880	670+h	1,00	190,0
2	1000	1200	1880	670+h	1,20	210,0
3	1000	1300	1880	670+h	1,3	215,0
4	1000	1400	1880	670+h	1,4	225,0
5	1000	1500	1880	670+h	1,5	240,0

Pos.	Nominal size		Dimensions in open position		Geometric area A_v[m²]	Cover weight [N]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
6	1000	1600	1880	670+h	1,6	245,0
7	1000	1700	1880	670+h	1,70	250,0
8	1000	1800	1880	670+h	1,80	260,0
9	1000	1900	1880	670+h	1,9	330,0
10	1000	2000	1880	670+h	2,00	340,0
11	1000	2200	1880	670+h	2,20	370,0
12	1000	2300	1880	670+h	2,30	380,0
13	1000	2400	1880	670+h	2,4	375,0
14	1000	2500	1880	670+h	2,50	390,0
15	1100	1100	2060	740+h	1,21	205,0
16	1100	2000	2060	740+h	2,2	355,0
17	1150	1150	2150	770+h	1,32	215,0
18	1150	2000	2150	770+h	2,3	355,0
19	1200	1200	2235	800+h	1,44	230,0
20	1200	1500	2235	800+h	1,80	260,0
21	1200	1700	2235	800+h	2,04	270,0
22	1200	1800	2235	800+h	2,16	280,0
23	1200	2000	2235	800+h	2,40	380,0
24	1200	2200	2235	800+h	2,64	400,0
25	1200	2300	2235	800+h	2,76	410,0
26	1200	2500	2235	800+h	3,00	430,0
27	1250	1250	2315	830+h	1,56	235,0
28	1250	2500	2315	830+h	3,12	430,0
29	1300	1300	2410	865+h	1,69	245,0
30	1300	1500	2410	865+h	1,95	265,0
31	1300	1600	2410	865+h	2,08	275,0
32	1300	1800	2410	865+h	2,34	290,0
33	1300	1900	2410	865+h	2,47	375,0
34	1300	2000	2410	865+h	2,6	385,0
35	1300	2200	2410	865+h	2,86	415,0
36	1300	2500	2410	865+h	3,25	440,0
37	1400	1400	2595	930+h	1,96	265,0
38	1400	1500	2595	930+h	2,1	275,0
39	1400	1800	2595	930+h	2,52	300,0
40	1400	2000	2595	930+h	2,8	405,0
41	1400	2500	2595	930+h	3,5	460,0
42	1450	1450	2690	965+h	2,1	275,0
43	1500	1500	2765	995+h	2,25	290,0
44	1500	1700	2765	995+h	2,55	310,0
45	1500	1800	2765	995+h	2,70	320,0
46	1500	2000	2765	995+h	3,00	430,0
47	1500	2200	2765	995+h	3,30	450,0
48	1500	2300	2765	995+h	3,45	460,0
49	1500	2500	2765	995+h	3,75	480,0
50	1500	2700	2765	995+h	4,05	500,0
51	1500	3000	2765	995+h	4,50	530,0
52	1600	1600	2940	1060+h	2,56	310,0
53	1600	1700	2940	1060+h	2,72	320,0

Pos.	Nominal size		Dimensions in open position		Geometric area A_v[m²]	Cover weight [N]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
54	1600	1800	2940	1060+h	2,88	330,0
55	1600	2000	2940	1060+h	3,20	440,0
56	1600	2200	2940	1060+h	3,52	470,0
57	1600	2300	2940	1060+h	3,68	480,0
58	1600	2500	2940	1060+h	4,00	500,0
59	1600	2700	2940	1060+h	4,32	520,0
60	1600	3000	2940	1060+h	4,80	550,0
61	1700	1700	3120	1125+h	2,89	330,0
62	1700	1800	3120	1125+h	3,06	340,0
63	1700	2000	3120	1125+h	3,40	460,0
64	1700	2200	3120	1125+h	3,74	490,0
65	1700	2300	3120	1125+h	3,91	500,0
66	1700	2500	3120	1125+h	4,25	520,0
67	1700	2700	3120	1125+h	4,59	540,0
68	1700	3000	3120	1125+h	5,10	570,0
69	1800	1800	3295	1190+h	3,24	350,0
70	1800	2000	3295	1190+h	3,60	480,0
71	1800	2200	3295	1190+h	3,96	510,0
72	1800	2300	3295	1190+h	4,14	520,0
73	1800	2500	3295	1190+h	4,50	540,0
74	1800	2700	3295	1190+h	4,86	560,0
75	1800	3000	3295	1190+h	5,40	590,0
76	1920	1900	3505	1265+h	3,61	480,0
77	1920	2000	3505	1265+h	3,80	500,0
78	1920	2200	3505	1265+h	4,18	530,0
79	1920	2300	3505	1265+h	4,37	540,0
80	1920	2500	3505	1265+h	4,75	560,0
81	1920	2700	3505	1265+h	5,13	580,0
82	1920	3000	3505	1265+h	5,70	610,0

Double leaf dampers – dimensions

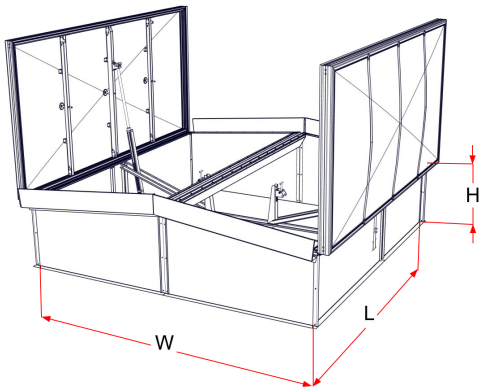


Figure 4. SCD-2-P... double leaf damper on a straight base.

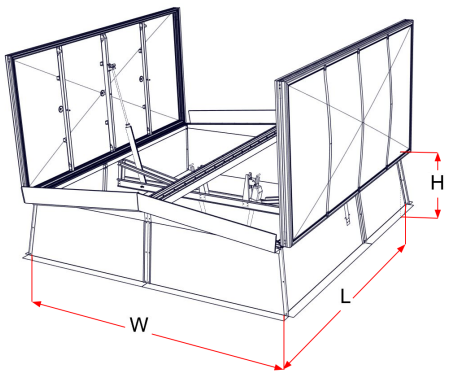


Figure 5. SCD-2-S... double leaf damper on a sloping base.

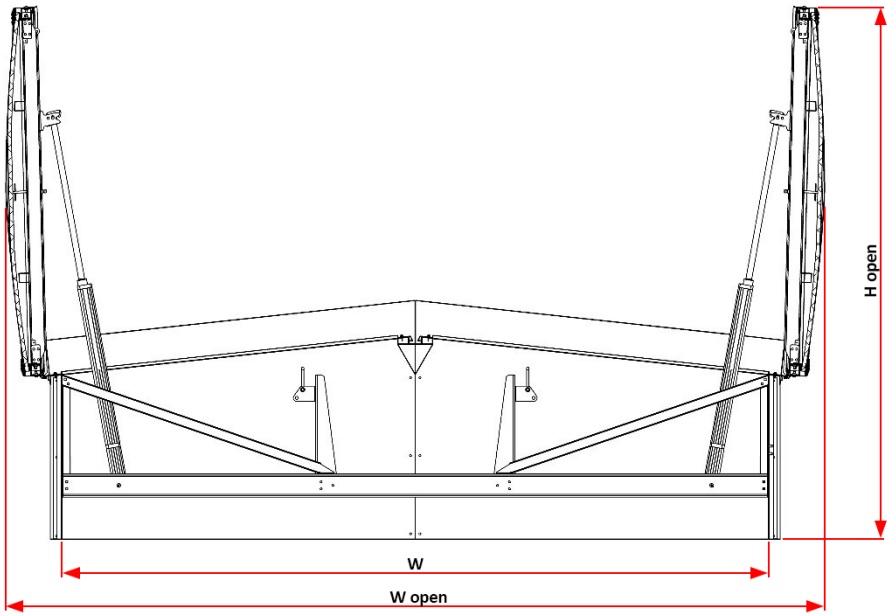


Figure 6. SCD-2-P... double leaf damper in open position.

Distinctive dimensions of SCD-2... dampers are shown in Table 3.

Table 3. Dimensions of SCD-2... dampers.

Pos.	Nominal size		Dimensions in open position		Geometric area A_v [m²]	Weight of a single cover [N] in [mm]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
1	1250	2500	1710	630+h	3,13	320
2	1500	1500	1960	830+h	2,25	210
3	1500	2500	1960	830+h	3,75	350
4	1500	3000	1960	830+h	4,50	390
5	1600	1600	2060	880+h	2,56	220
6	1600	2500	2060	880+h	4,00	360
7	1600	2800	2060	880+h	4,48	380
8	1600	3000	2060	880+h	4,80	400
9	1800	1600	2260	880+h	2,88	230
10	1800	1800	2260	980+h	3,24	250
11	1800	2500	2260	980+h	4,50	370

Pos.	Nominal size		Dimensions in open position		Geometric area A_v[m²]	Weight of a single cover [N] in [mm]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
12	1800	2800	2260	980+h	5,04	400
13	1800	3000	2260	980+h	5,40	420
14	2000	2000	2460	1080+h	4,00	340
15	2000	2400	2460	1080+h	4,80	380
16	2000	2500	2460	1080+h	5,00	390
17	2000	2800	2460	1080+h	5,60	420
18	2000	3000	2460	1080+h	6,00	440
19	2200	2200	2660	1180+h	4,84	380
20	2200	2400	2660	1180+h	5,28	400
21	2200	2500	2660	1180+h	5,50	410
22	2400	2400	2860	1280+h	5,76	420
23	2400	2500	2860	1280+h	6,00	430
24	2500	2500	2960	1330+h	6,25	440
25	2500	3000	2960	1330+h	7,50	480
26	3000	3000	3460	1580+h	9,00	530

Table 4. Manufacturing versions.

Damper type	Main drive	Base type		Base height			Function Operating mode		Operating mode		Thickness of PC filling			
		straight	sloping	350	500	700	smoke extraction only	smoke extraction + electric ventilation	Open	Open –close	10	16	20	25
Single leaf	pneumatic	X	X	X	X	X	X	X	X	X	X	X	X	X
	electric	X	X	X	X	X	X	X		X	X	X	X	X
Double leaf	pneumatic	X	X	X	X	X	X	X	X	X	X	X	X	X
	electric	X	X	X	X	X	X	X		X	X	X	X	X

Damper weights

Approximate weights of single leaf dampers are shown in Table 5.

Table 5. Approximate weights of single leaf.

No.	W [mm]	l [mm] (hinges)	Base height 350 mm				Base height 500 mm				Base height 700 mm			
			P-Pn	P-El	S-Pn	S-El	P-Pn	P-El	S-Pn	S-El	P-Pn	P-El	S-Pn	S-El
1	1000	1000	73,70	76,10	65,90	68,30	84,40	86,80	75,90	78,30	98,70	101,10	89,20	91,60
2	1000	1200	78,90	81,30	71,10	73,50	90,40	92,80	81,80	84,20	105,60	108,00	96,10	98,50
3	1000	1300	81,50	83,90	72,70	75,10	93,30	95,70	83,70	86,10	109,00	111,40	98,50	100,90
4	1000	1400	84,10	86,50	75,20	77,60	96,20	98,60	86,70	89,10	112,40	114,80	101,90	104,30
5	1000	1500	86,70	89,10	77,90	80,30	99,20	101,60	89,60	92,00	115,90	118,30	105,40	107,80
6	1000	1600	89,30	91,70	80,40	82,80	102,20	104,60	92,60	95,00	119,30	121,70	108,80	111,20
7	1000	1700	91,90	94,30	83,00	85,40	105,10	107,50	95,50	97,90	122,70	125,10	112,20	114,60
8	1000	1800	94,50	96,90	84,60	87,00	108,10	110,50	97,50	99,90	126,20	128,60	114,70	117,10
9	1000	1900	103,10	105,50	93,20	95,60	117,00	119,40	106,50	108,90	135,60	138,00	124,10	126,50
10	1000	2000	105,60	108,00	94,80	97,20	120,00	122,40	108,40	110,80	139,10	141,50	126,50	128,90
11	1000	2200	110,80	113,20	101,00	103,40	125,90	128,30	115,30	117,70	146,00	148,40	134,40	136,80
12	1000	2300	113,40	115,80	102,60	105,00	128,80	131,20	117,30	119,70	149,40	151,80	136,80	139,20
13	1000	2400	116,00	118,40	105,20	107,60	131,80	134,20	120,20	122,60	152,80	155,20	140,30	142,70
14	1000	2500	118,60	121,00	107,80	110,20	134,80	137,20	123,20	125,60	156,30	158,70	143,70	146,10
15	1100	1100	78,80	81,20	70,90	73,30	90,30	92,70	81,60	84,00	105,50	107,90	95,90	98,30
16	1100	2000	109,20	111,60	98,30	100,70	123,90	126,30	112,20	114,60	143,40	145,80	130,90	133,30
17	1150	1150	81,40	83,80	73,50	75,90	93,20	95,60	84,60	87,00	108,90	111,30	99,30	101,70
18	1150	2000	110,90	113,30	100,10	102,50	125,80	128,20	114,20	116,60	145,60	148,00	133,10	135,50
19	1200	1200	83,90	86,30	75,00	77,40	96,00	98,40	86,50	88,90	112,20	114,60	101,70	104,10
20	1200	1500	91,70	94,10	82,80	85,20	104,90	107,30	95,30	97,70	122,60	125,00	112,00	114,40
21	1200	1700	96,90	99,30	88,00	90,40	110,80	113,20	101,30	103,70	129,50	131,90	118,90	121,30
22	1200	1800	99,40	101,80	89,60	92,00	113,80	116,20	103,20	105,60	132,90	135,30	121,30	123,70
23	1200	2000	117,70	119,90	107,90	110,10	132,80	135,00	122,20	124,40	152,90	155,10	141,30	143,50
24	1200	2200	123,90		113,10		139,70		128,10		160,70		148,20	
25	1200	2300	129,00		118,20		145,20		133,60		166,70		154,10	
26	1200	2500	134,20		123,30		151,00		139,50		173,50		161,00	
27	1250	1250	86,40	88,80	77,60	80,00	98,90	101,30	89,40	91,80	115,60	118,00	105,10	107,50
28	1250	2500	127,40		115,50		144,40		131,80		167,10		153,60	
29	1300	1300	89,00	91,40	80,20	82,60	101,90	104,30	92,30	94,70	119,00	121,40	108,50	110,90
30	1300	1500	94,20	96,60	85,30	87,70	107,80	110,20	98,20	100,60	125,90	128,30	115,30	117,70
31	1300	1600	96,80	99,20	87,90	90,30	110,70	113,10	101,20	103,60	129,40	131,80	118,80	121,20
32	1300	1800	101,90	104,30	93,10	95,50	116,60	119,00	107,00	109,40	136,20	138,60	125,70	128,10
33	1300	1900	112,60	115,00	101,70	104,10	127,60	130,00	116,00	118,40	147,70	150,10	135,10	137,50
34	1300	2000	121,20	123,40	110,40	112,60	136,60	138,80	125,10	127,30	157,20	159,40	144,70	146,90
35	1300	2200	127,40	129,60	116,60	118,80	143,60	145,80	132,00	134,20	165,10	167,30	152,60	154,80
36	1300	2500	137,70	145,10	125,90	133,30	154,90	162,30	142,40	149,80	177,90	185,30	164,40	171,80
37	1400	1400	100,20	102,40	91,30	93,50	113,80	116,00	104,20	106,40	131,90	134,10	121,40	123,60
38	1400	1500	102,80	105,00	93,90	96,10	116,70	118,90	107,10	109,30	135,40	137,60	124,80	127,00
39	1400	1800	111,60	113,80	101,70	103,90	126,60	128,80	116,00	118,20	146,70	148,90	135,10	137,30
40	1400	2000	124,70	126,90	113,90	116,10	140,50	142,70	128,90	131,10	161,50	163,70	149,00	151,20
41	1400	2500	141,20	148,60	129,30	136,70	158,80	166,20	146,20	153,60	182,20	189,60	168,70	176,10
42	1450	1450	103,70	105,90	93,80	96,00	117,70	119,90	107,10	109,30	136,30	138,50	124,70	126,90

No.	W [mm]	l [mm] (hinges)	Base height 350 mm				Base height 500 mm				Base height 700 mm			
			P-Pn	P-El	S-Pn	S-El	P-Pn	P-El	S-Pn	S-El	P-Pn	P-El	S-Pn	S-El
43	1500	1500	106,30	108,50	96,40	98,60	120,60	122,80	110,00	112,20	139,70	141,90	128,20	130,40
44	1500	1700	111,40	113,60	101,60	103,80	126,50	128,70	115,90	118,10	146,50	148,70	135,00	137,20
45	1500	1800	116,50	123,90	106,70	114,10	132,00	139,40	121,40	128,80	152,50	159,90	141,00	148,40
46	1500	2000	130,70	138,10	118,80	126,20	146,80	154,20	134,30	141,70	168,30	175,70	154,80	162,20
47	1500	2200	136,90	144,30	125,10	132,50	153,80	161,20	141,20	148,60	176,20	183,60	162,70	170,10
48	1500	2300	139,50	146,90	127,60	135,00	156,70	164,10	144,10	151,50	179,70	187,10	166,10	173,50
49	1500	2500	144,70		132,80		162,60		150,10		186,60		173,00	
50	1500	2700	149,90		138,00		168,60		156,00		193,50		179,90	
51	1500	3000	162,00		150,10		181,70		169,10		208,10		194,50	
52	1600	1600	111,30	113,50	101,50	103,70	126,40	128,60	115,80	118,00	146,40	148,60	134,90	137,10
53	1600	1700	113,90	116,10	104,10	106,30	129,40	131,60	118,80	121,00	149,90	152,10	138,40	140,60
54	1600	1800	116,50	118,70	106,70	108,90	132,30	134,50	121,70	123,90	153,30	155,50	141,80	144,00
55	1600	2000	131,70	133,90	119,90	122,10	148,20	150,40	135,70	137,90	170,20	172,40	156,70	158,90
56	1600	2200	137,90	140,10	126,00	128,20	155,10	157,30	142,50	144,70	178,10	180,30	164,50	166,70
57	1600	2300	140,50	142,70	128,70	130,90	158,10	160,30	145,50	147,70	181,50	183,70	168,00	170,20
58	1600	2500	152,50	156,40	140,60	144,50	170,80	174,70	158,20	162,10	195,20	199,10	181,60	185,50
59	1600	2700	157,70		145,80		176,70		164,10		202,10		188,50	
60	1600	3000	165,40		152,60		185,60		172,00		212,40		197,90	
61	1700	1700	116,40	118,60	106,60	108,80	132,20	134,40	121,60	123,80	153,20	155,40	141,70	143,90
62	1700	1800	121,50	128,90	111,70	119,10	137,60	145,00	127,10	134,50	159,20	166,60	147,60	155,00
63	1700	2000	137,70	145,10	125,90	133,30	154,60	162,00	142,00	149,40	177,10	184,50	163,50	170,90
64	1700	2200	143,90	151,30	132,00	139,40	161,50	168,90	148,90	156,30	184,90	192,30	171,40	178,80
65	1700	2300	150,80		138,90		168,70		156,20		192,70		179,10	
66	1700	2500	156,00		143,10		174,70		161,00		199,60		185,00	
67	1700	2700	161,10		148,30		180,50		167,00		206,40		191,90	
68	1700	3000	169,90		156,10		190,40		175,80		217,70		202,20	
69	1800	1800	125,00	132,40	114,10	121,50	141,50	148,90	129,90	137,30	163,50	170,90	151,00	158,40
70	1800	2000	144,50		132,60		161,70		149,10		184,70		171,10	
71	1800	2200	151,70		138,80		169,60		156,10		193,60		179,00	
72	1800	2300	154,30		141,40		172,60		159,00		197,00		182,50	
73	1800	2500	159,50		146,60		178,50		164,90		203,90		189,40	
74	1800	2700	164,60		151,80		184,40		170,80		210,70		196,20	
75	1800	3000	173,40		159,60		194,20		179,70		222,00		206,50	
76	1920	1900	145,70		133,80		163,00		150,40		186,10		172,50	
77	1920	2000	149,30		136,40		166,90		153,40		190,50		175,90	
78	1920	2200	155,50		142,60		173,90		160,30		198,40		183,80	
79	1920	2300	158,00		145,20		176,80		163,20		201,80		187,30	
80	1920	2500	163,20		150,40		182,70		169,10		208,70		194,10	
81	1920	2700	169,50		155,60		189,60		175,10		216,60		201,00	
82	1920	3000	177,20		163,40		198,50		183,90		226,90		211,40	

St - straight base

Sl - sloping base

Pn - pneumatic actuator (exemplary selection. The actuator type depends on T, SL class)

El – electric actuator

*Cover weight – applies to covers with polycarbonate filling of 16 [mm] thickness and SL 550, no insulation.

Approximate weights of double leaf dampers are shown in Table 6.

Table 6. Approximate weights of double leaf dampers.

W [mm]	l [mm] (hinges)	Base height 350 mm				Base height 500 mm				Base height 700 mm			
		P-Pn	P-El	S-Pn	S-El	P-Pn	P-El	S-Pn	S-El	P-Pn	P-El	S-Pn	S-El
1250	2500	162,7	167,5	153,7	158,5	179,7	184,5	170	174,8	202,4	207,2	191,8	196,6
1500	1500	126	130,8	117	121,8	140,4	145,2	130,6	135,4	159,5	164,3	148,8	153,6
1500	2500	173,5	178,3	162,5	167,3	191,4	196,2	179,7	184,5	215,4	220,2	202,7	207,5
1500	3000	200,4	204,8	191,4	195,8	220,1	224,5	210,4	214,8	246,5	250,9	235,8	240,2
1600	1600	133,7	138,5	124,7	129,5	148,8	153,6	139,1	143,9	168,8	173,6	158,2	163
1600	2500	177,4	182,2	166,4	171,2	195,7	200,5	184	188,8	220,1	224,9	207,5	212,3
1600	2800	198,8	203,2	187,9	192,3	218,2	222,6	206,5	210,9	244,1	248,5	231,4	235,8
1600	3000	204,3	208,7	195,3	199,7	224,4	228,8	214,7	219,1	251,3	255,7	240,6	245
1800	1600	139,6	144,5	130,6	135,4	155,4	160,2	145,6	150,4	176,4	181,2	165,7	170,5
1800	1800	147	151,8	138,1	142,9	163,5	168,3	153,8	158,6	185,5	190,3	174,9	179,7
1800	2500	185,3	190,1	174,3	179,1	204,3	209,1	192,6	197,4	229,7	234,5	217	221,8
1800	2800	206,7	211,1	195,7	200,1	226,8	231,2	215,1	219,5	253,7	258,1	241	245,4
1800	3000	218,1	232,9	207,2	222	239	253,8	227,3	242,1	266,8	281,6	254,1	268,9
2000	2000	172,4	177,2	163,4	168,2	190,3	195,1	180,6	185,4	214,3	219,1	203,6	208,4
2000	2400	189,3	194,1	180,4	185,2	208,7	213,5	199	203,8	234,6	239,4	223,9	228,7
2000	2500	203,3	207,7	192,3	196,7	223,1	227,5	211,4	215,8	249,4	253,8	236,8	241,2
2000	2800	218,5	233,3	207,6	222,4	239,4	254,2	227,7	242,5	267,2	282	254,5	269,3
2000	3000	226	240,8	215	229,8	247,6	262,4	235,9	250,7	276,3	291,1	263,7	278,5
2200	2200	191,7	196,5	180,8	185,6	211,1	215,9	199,4	204,2	237	241,8	224,3	229,1
2200	2400	197,2	202	188,2	193	217,3	222,1	207,6	212,4	244,2	249	233,5	238,3
2200	2500	211,2	215,6	200,2	204,6	231,7	236,1	219,9	224,3	259	263,4	246,3	250,7
2400	2400	219,2	234	210,3	225,1	240,1	254,9	230,4	245,2	267,9	282,7	257,2	272
2400	2500	223	237,8	214	228,8	244,2	259	234,5	249,3	272,5	287,3	261,8	276,6
2500	2500	227	241,8	218	232,8	248,5	263,3	238,8	253,6	277,3	292,1	266,6	281,4
2500	3000	254,2	262	243,2	251	277,6	285,4	265,9	273,7	308,8	316,6	296,1	303,9
3000	3000	272,2	280	261,2	269	294,9	302,7	283,2	291	325,3	333,1	312,6	320,4

St - straight base
Sl - sloping base
Pn - pneumatic actuator (exemplary selection. The actuator type depends on T, SL class)
El – electric actuator

*Cover weight – applies to covers with polycarbonate filling of 16 [mm] thickness and SL 550, no insulation.

In exceptional situations there is the possibility of making dampers with different hole dimensions, but only within the range of terminal dimensions shown in Tables 2 and 3. Values calculated by means of linear interpolation should be considered as valid declarations for Aa active area.
The values for the height of damper bases in the basic series are 350, 500, 700 mm. The smoke dampers should protrude at least 300 mm over the roof plane. Therefore, when selecting the base height, you need to take into consideration your roof structure and thermal insulation layers.
It is possible to make dampers with other base dimensions, however not smaller than 350 mm.
For dampers with base heights other than the basic ones, the dampers with a lower base should be considered as valid declarations for Aa active area.

Available Versions

In SCD smoke dampers, a basic function of emergency opening in order to extract smoke is carried out by a pneumatic or electric 24 V actuator.

The function of opening in order to vent for dampers with a pneumatic drive is carried out by the second 230 V or 24 V electric actuator (for the dampers with maximum leaf dimensions up to 1920 x 2500) or 230 V or 24 V electric actuator.

The power transmission from the actuator to the damper's cover is carried out by a special mechanism, and the cover position is set by a spring lock. Available versions, in respect of the SL;T classification, for particular sizes of the single leaf dampers are shown in Table 7.

Table 7. Available versions of particular sizes of the single leaf dampers.

w [mm]	l [mm]	Pneumatic drive		Electric drive	w [mm]	l [mm]	Pneumatic drive		Electric drive
		SL 1000	SL 550	SL 550			SL 1000	SL 550	SL 550
1000	1000	T (-15), T (-25),	T (-25),		1450	1450	T (-15),	T (-15), T (-25),	
1000	1200	T (-15), T (-25),	T (-25),		1500	1500	T (-05),	T (-05), T (-25),	
1000	1300	T (-15), T (-25),	T (-25),		1500	1700	T (-05),	T (-05), T (-15),	
1000	1400	T (-05), T (-25),	T (-25),		1500	1800	T (-05),	T (-05), T (-15),	T(-25)
1000	1500	T (-05), T (-25),	T (-25),		1500	2000	T (00),	T (-15),	
1000	1600	T (-05), T (-15),	T (-25),		1500	2200		T (-15),	
1000	1700	T (-05), T (-15),	T (-15), T (-25),		1500	2300		T (-15),	
1000	1800	T (-05), T (-15),	T (-15), T (-25),		1500	2500		T (-05),	
1000	1900	T (00), T (-15),	T (-15), T (-25),		1500	2700		T (-05),	
1000	2000	T (00), T (-15),	T (-15), T (-25),		1500	3000		T (-05),	
1000	2200		T (-15), T (-25),		1600	1600	T (00), T (-15),	T (-15), T (-25),	
1000	2300		T (-15), T (-25),	T(-25)	1600	1700	T (-15),	T (-15), T (-25),	
1000	2400		T (-05), T (-25),		1600	1800	T (-15),	T (-15), T (-25),	
1000	2500		T (-05), T (-25),		1600	2000	T (-05),	T (-05), T (-25),	T(-25)
1100	1100	T (-15), T (-25),	T (-25),		1600	2200	T (-05),	T (-15),	
1100	2000		T (-05), T (-25),		1600	2300	T (-05),	T (-15),	
1150	1150	T (-05), T (-25),	T (-25),		1600	2500	T (00),	T (-15),	
1150	2000		T (-05), T (-15),		1600	2700	T (00),	T (-15),	
1200	1200	T (-05), T (-15),	T (-15), T (-25),		1600	3000		T (-15),	
1200	1500	T (00), T (-15),	T (-15), T (-25),		1700	1700	T (-05),	T (-15), T (-25),	
1200	1700		T (-15), T (-25),		1700	1800	T (-05),	T (-05), T (-25),	T(-25)
1200	1800		T (-05), T (-25),		1700	2000	T (-05),	T (-15),	
1200	2000		T (-15),		1700	2200	T (00),	T (-15),	
1200	2200		T (-15),		1700	2300	T (00),	T (-15),	
1200	2300		T (-15),		1700	2500		T (-15),	
1200	2500		T (-15),		1700	2700		T (-15),	
1250	1250	T (00), T (-15),	T (-15), T (-25),	T(-25)	1700	3000		T (-05),	
1250	2500				1800	1800	T (-05),	T (-05), T (-15),	T(-25)
1300	1300	T (-05), T (-15),	T (-25),		1800	2000	T (00),	T (-15),	
1300	1500	T (-05), T (-15),	T (-15), T (-25),		1800	2200		T (-15),	
1300	1600	T (00), T (-15),	T (-15), T (-25),		1800	2300		T (-15),	
1300	1800	T (-15),	T (-15), T (-25),		1800	2500		T (-05),	
1300	1900	T (-05),	T (-05), T (-25),		1800	2700		T (-05),	
1300	2000	T (-05),	T (-05), T (-25),		1800	3000		T (-05),	
1300	2200	T (-05),	T (-05), T (-15),	T(-25)	1920	1900	T (00),	T (-15),	
1300	2500	T (-05),	T (-15),		1920	2000		T (-15),	
1400	1400	T (00), T (-15),	T (-15), T (-25),		1920	2200		T (-05),	
1400	1500	T (-15),	T (-15), T (-25),		1920	2300		T (-05),	
1400	1800	T (-05),	T (-05), T (-25),		1920	2500		T (-05),	
1400	2000	T (-05),	T (-05), T (-15),		1920	2700		T (-05),	
1400	2500		T (-15),		1920	3000		T (-05),	

Available versions, in respect of the SL;T classification, for particular sizes of the double leaf dampers are shown in Table 8.

Table 8. Available versions of particular sizes of the double leaf dampers.

w [mm]	l [mm]	Pneumatic drive		Electric drive	w [mm]	l [mm]	Pneumatic drive		Electric drive
		SL 1000	SL 550	SL 550			SL 1000	SL 550	SL 550
1250	2500	T(-05), T (-15), T (-25),	T (-15), T (-25),		2000	2000	T(-05), T (-15), T (-25),	T(-05), T (-15), T (-25),	
1500	1500	T (-15), T (-25),	T (-25),		2000	2400	T(00), T (-15), T (-25),	T(00), T (-15), T (-25),	
1500	2500	T (-05), T (-25),	T (-05), T (-25),		2000	2500	T (-15), T (-25),	T(00), T (-15), T (-25),	
1500	3000	T(-05), T (-15), T (-25),	T(-05), T (-15), T (-25),		2000	2800	T (-05), T (-25),	T (-05), T (-25),	T(-25)
1600	1600	T(-05), T (-15), T (-25),	T (-15), T (-25),		2000	3000	T (-05), T (-15),	T (-05), T (-25),	
1600	2500	T(-05), T (-15), T (-25),	T (-05), T (-25),		2200	2200	T (-05), T (-25),	T (-15), T (-25),	
1600	2800	T(-05), T (-15), T (-25),	T(-05), T (-15), T (-25),	T(-25)	2200	2400	T (-05), T (-15),	T (-05), T (-25),	
1600	3000	T(-05), T (-15), T (-25),	T(-05), T (-15), T (-25),		2200	2500	T (-05), T (-15),	T(-05), T (-15), T (-25),	
1800	1600	T(00), T (-15), T (-25),	T (-15), T (-25),		2400	2400	T (-05), T (-15),	T(-05), T (-15), T (-25),	
1800	1800	T(-05), T (-25),	T (-15), T (-25),		2400	2500	T (00), T (-15),	T(-05), T (-15), T (-25),	
1800	2500	T(00), T (-15), T (-25),	T(00), T (-15), T (-25),		2500	2500	T (00), T (-15),	T(00), T (-15), T (-25),	
1800	2800	T (-15), T (-25),	T(00), T (-15), T (-25),		2500	3000	T (-05),	T (-05), T (-25),	T(-25)
1800	3000	T (-05), T (-25),	T (-05), T (-25),		3000	3000	T (00),	T (00), T (-15),	

Smoke Dampers with the SCD-1-W Roof Hatch Function

Figure 7. A damper with a roof hatch function – version 1.

Figure 8. A damper with a roof hatch function – version 2.

Table 9. Distinctive dimensions of dampers.

Pos.	Nominal size		Dimensions in open position		Geometric area A_v[m²]	Cover weight [N]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
1	1000	1000	1880	670+h	1,00	190,0
2	1000	1200	1880	670+h	1,20	210,0
3	1000	1300	1880	670+h	1,3	215,0
4	1000	1400	1880	670+h	1,4	225,0
5	1000	1500	1880	670+h	1,5	240,0
6	1000	1600	1880	670+h	1,6	245,0
7	1000	1700	1880	670+h	1,70	250,0
8	1000	1800	1880	670+h	1,80	260,0
9	1100	1100	2060	740+h	1,21	205,0
10	1150	1150	2150	770+h	1,32	215,0
11	1200	1200	2235	800+h	1,44	230,0
12	1200	1500	2235	800+h	1,80	260,0
13	1200	1700	2235	800+h	2,04	270,0
14	1200	1800	2235	800+h	2,16	280,0
15	1250	1250	2315	830+h	1,56	235,0
16	1300	1300	2410	865+h	1,69	245,0

Pos.	Nominal size		Dimensions in open position		Geometric area A_v[m²]	Cover weight [N]
	w [mm]	l (hinges) [mm]	W open [mm]	H open [mm]		
17	1300	1500	2410	865+h	1,95	265,0
18	1300	1600	2410	865+h	2,08	275,0
19	1300	1800	2410	865+h	2,34	290,0
20	1400	1400	2595	930+h	1,96	265,0
21	1400	1500	2595	930+h	2,1	275,0
22	1400	1800	2595	930+h	2,52	300,0
23	1450	1450	2690	965+h	2,1	275,0
24	1500	1500	2765	995+h	2,25	290,0
25	1500	1700	2765	995+h	2,55	310,0
26	1500	1800	2765	995+h	2,70	320,0
27	1600	1600	2940	1060+h	2,56	310,0
28	1600	1700	2940	1060+h	2,72	320,0
29	1600	1800	2940	1060+h	2,88	330,0
30	1700	1700	3120	1125+h	2,89	330,0
31	1700	1800	3120	1125+h	3,06	340,0
32	1800	1800	3295	1190+h	3,24	350,0

SCD-1-W smoke dampers are classified according to PN-EN 12101-2 criteria, with reference to the following areas:

- Reliability: double action, Re 1000,
- Snow load: SL 550
- Low temperature: T(-25)
- Wind load: WL 1500
- Resistance to high temperature: B300
- The active area of the dampers with a roof hatch function, with w ⩽ 1200 dimension is smaller by 3% than the area of standard version dampers.
- The active area of the dampers with a roof hatch function, with w > 1200 dimension is equal to the area of standard version dampers.

Optional Accessories

Wind deflectors

Wind deflectors are to maximize the active area of smoke dampers. They are used when expected impact of wind would decrease the active area of a smoke damper. These are profiled elements made of galvanised steel sheet, optimized during aerodynamic tests.

Deflectors are mounted to a damper base with the use of the bolted connection.

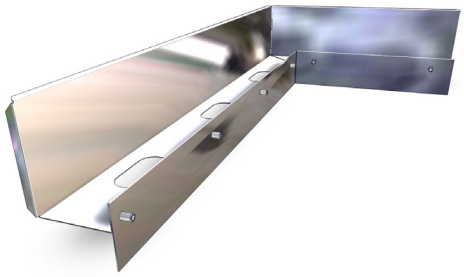


Figure 9. Wind deflector.

KA anti-burglar bars

Anti-burglar bars are to protect a facility against unauthorized persons' entry through a smoke damper. The bars are made for the full dimension range of single and double leaf dampers. The anti-burglar bars are made with the use of standard and custom galvanised steel profiles and 1/2" pipes. They may be painted to any colour from the RAL palette.

They are mounted in the hole under the damper base. To avoid any collision with the drive elements they can consist of two parts.

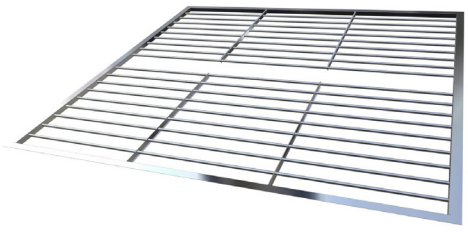


Figure 10. KA anti-burglar bars.

KZU anti-fall grates

The purpose of the anti-fall grate is to protect people staying on the roof near a smoke damper against falling through the damper hole. They are made for the full dimension range of single and double leaf dampers. To avoid any collision with drive elements they consist of two parts.

The anti-fall grates are made of stainless steel cords.

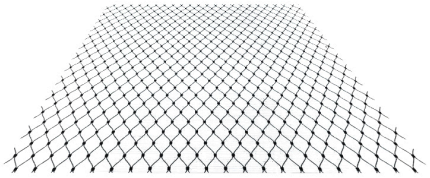


Figure 11. KZU anti-fall grate.

Drives and Control

In SCD smoke dampers, a basic function of emergency opening in order to extract smoke is carried out by a pneumatic or electric 24 V actuator.

The function of opening in order to vent for dampers with a pneumatic drive is carried out by a 230 V or 24 V electric actuator.

The power transmission from the actuator to the damper cover is carried out by a special mechanism, and the cover position is set by a MHV spring lock.

In the case of control system failure, which prevents the SCD damper leaf from closing, please contact Smay Sp. z o.o. Service Department.

For the leaf emergency closing, when the control system does not operate, before the service staff arrives, it is necessary to disconnect the immobilised actuator from the leaf (by disconnecting the eye bolt from the MHV lock or by unscrewing the eye bolt from the actuator, or by disconnecting the E actuator from the fixing console), close the leaf and protect it against opening.

Figure 12. MHV spring lock.

Pneumatic Drives

Configurations

For emergency opening, dampers with a pneumatic drive use pneumatic actuators powered by the energy of CO_2 gas compressed in special dedicated containers. The containers are equipped with safety valves.

The compressed gas energy release may take place:

- Automatically – when a thermal trip operates. If the trigger temperature is reached, the detector in the TAVE or TAVZ thermal trip is destroyed, a pin is triggered, which – in turn – triggers a cartridge with compressed CO_2. The gas fills up pneumatic actuators and the smoke damper opens.
- Manually – if fire has been noticed, a member of staff pushes the manual start button in the AK alarm box of the given fire zone. The AK box is connected with the smoke damper by means of a Ø6 mm copper tube. In the AK box there are cylinders with compressed CO_2; the gas fills up the system and opens smoke dampers in the given zone.
- From the Fire Alarm System (Polish acronym SAP) – the system is adapted for connecting 24 V electric signal from SAP.

It is possible to control dampers by means of a "open only" function – "A" type damper. At that time, after test opening, it is necessary to close the damper manually, from the roof level.

In the case the double pipe system and a proper actuator type are used, there is the possibility of carrying out control by means of "open-close" function – "B" type damper. This type of control by means of a compressor and a PLZ ventilation box, can also carry out the service function.

SCD-1.., single leaf dampers with a pneumatic drive are equipped with cables to limit the leaf movement. Before starting up a damper, check if the cables are in free position.

The compressed air supply system of the actuator shall be appropriate for pressure of 30 bar. Most often it is made of stainless steel or copper pipes.

Photo 1. Pneumatic actuators.

Exemplary Schemes of Damper Opening Control

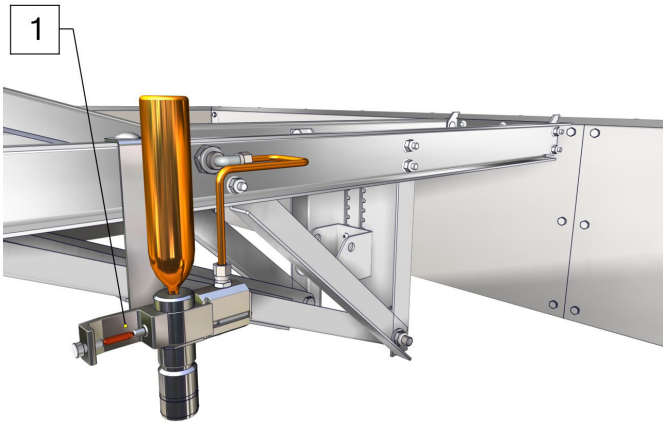


Figure 13. "A" type damper with a pneumatic actuator and thermal trip. Without ventilation function. Automatic opening after the limit temperature has been reached.

1.TAVZ thermal trip.

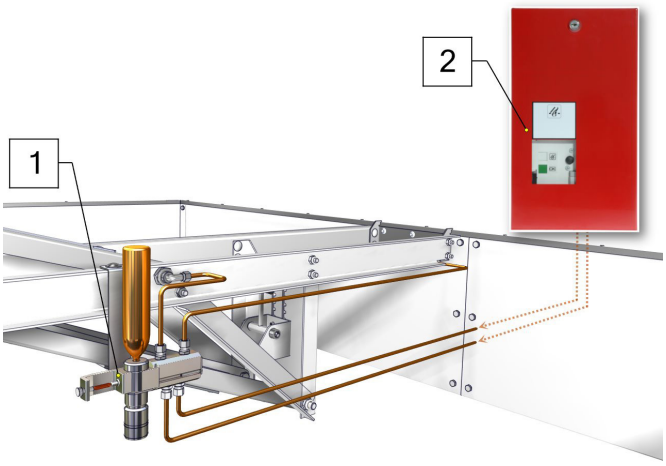


Figure 14. "A" or "B" type damper, with a pneumatic actuator, thermal trip and alarm box. Manual or automatic opening after the limit temperature has been reached or opening with a SAP signal (with an electric module in the AK box). Without ventilation function.

1. TAVZ thermal trip.
2. AK alarm box.

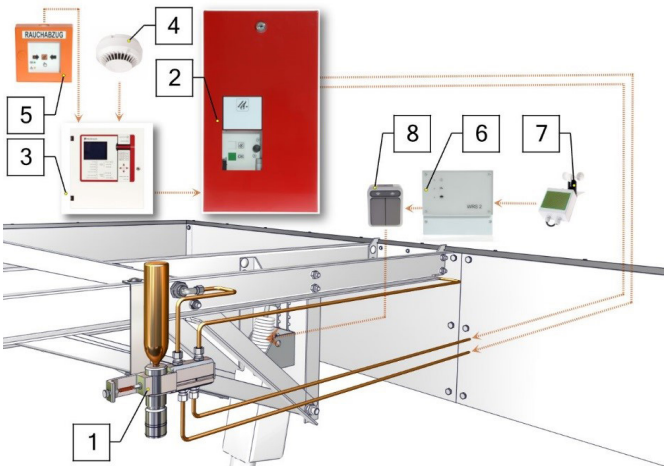


Figure 15. "A" or "B" type damper, with a pneumatic actuator, thermal trip, alarm box and weather station. Manual or automatic opening after the limit temperatureor opening with a SAP signal (with an electric module in the AK box). Ventilation with electric actuator.

1. TAVZ thermal trip.
2. AK alarm box.
3. SAP control panel.
4. OSD 63 smoke detector.
5. RT-2 smoke extraction push button.
6. WRS 2b weather control panel.
7. RS 2d-WM1 weather station.
8. LT-AP ventilation push button.

Pneumatic actuators

Depending on a damper size and required SL... parameter, the following types of actuators are dedicated: PxxV-32, PxxV-40, PxxV-50 PxxV- 63 or DxxV-32.

Photo 2. PxxV actuators.

In respect of functionality, the following devices may be used:

- actuators with the following stroke:
  - single (PxxV),
- actuators with the following fastening:
  - bottom (PUxV),
  - mid-level (PMxV),
  - top (POxV),
- actuators with the following position lock:
  - advanced (PxAV),
  - both end positions (PxDV).

Basic features:

- Piston actuator, single- or double-acting, with the body diameter of 32-63 mm,
- Body made of anodised aluminium,
- 12, 16, 20 or 25 mm diameter piston rod, depending on the actuator size,
- Eye bolt with M8 thread, gasket being also a wiper for the piston,
- M8 x 40 – Ø8 – Ø12 eye bolt holes, depending on the actuator size,
- Recommend operating pressure 6-10 bar,
- Maximum static operating pressure 60 bar,
- Theoretical lifting force, depending on size, at 6 bar pressure: 480-1870 N, depending on the actuator size (when selecting, take into account approximately 15% loss due to friction),
- Installation and gas inflow through rotatable screw couplers,
- Ambient temperature range from -20 to +60 °C (within the range of VdS 2159 Certificate, for 2 hours, up to +110 °C),
- Maximum locking force 6500 N,

PxxV series pneumatic actuators are maintenance-free, because their design ensures constant lubrication. However, the piston rod and actuator locks should be cleaned regularly and lubricated with widely available silicone-free greases.

In the case of actuators operating in such an environment as the landfarm, food industry, galvanising plants, chemical industry, swimming pools, SPA etc., it is recommended to use water separators, preferably just before control valves, and the condensate drain in a compressed air tank. Alternatively an air dehumidifier can be used.

Thermal trip

In the thermal trip, when the thermal fuse has been triggered at the given limit temperature, CO_2 is released from its cylinder and flows to the actuator, causing the damper to open. The thermal fuse reacts at the specific nominal temperature, with -3 °C / +8 °C tolerance.

Components:

- Thermal fuse (ampoule)
- Cylinder with CO_2
- Pin
- Optionally other triggering elements (electric, pneumatic triggers)

Technical Data:

Maximum static operating pressure	**80 bar**
Maximum dynamic operating pressure	**80 bar**
Valve nominal diameter	**2 mm**
Pin nominal diameter	**2 mm**
Operating temperature range	**-25°C do +110°C**

In systems carrying out the "A" "open only" operating mode, TAVE thermal trips are used.

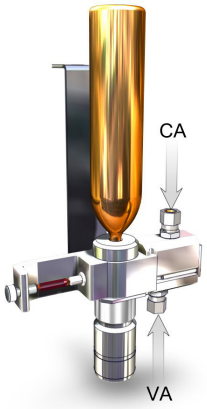


Figure 16. TAVE thermal trip.

Channels marking:
VA - "Open" input
CA - "Open" output

Types of TAVE thermal trips:

Type	Vent valve	A Cylinder thread
TAVE 3.01	no	1/2" UNF (standard)
TAVE 3.01-M	no	M18x1,5
TAVE 3.01-F	no	W21,8x1/14"
TAVE 3.11	yes	1/2" UNF (standard)
TAVE 3.11-M	yes	M18x1,5
TAVE 3.11-F	yes	W21,8x1/14"

VA input in standby mode (the valve enabled–disabled) is connected with the CA output, which makes it possible, among other things, to carry out the damper ventilation function without any interruption.

Option with venting:

CA output in standby mode is vented by means of an integrated drain (vent) valve. After pressurising VA input (from the alarm or ventilation box), connection between VA input and CA output is set up.

In systems carrying out the "B" "open-close" operating mode, TAVZ thermal trips are used.

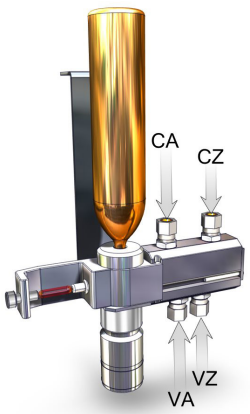


Figure 17. TAVZ thermal trip.

Channels marking:
VA - "Open" input
VZ - "Close" input
CA - "Open" output
CZ - "Close" output

Types of TAVZ thermal trips

Type	Vent valve	A Cylinder thread
TAVZ 3.01	no	1/2" UNF (standard)
TAVZ 3.01-M	no	M18x1,5
TAVZ 3.01-F	no	W21,8x1/14"
TAVZ 3.11	yes	1/2" UNF (standard)
TAVZ 3.11-M	yes	M18x1,5
TAVZ 3.11-F	yes	W21,8x1/14"

VA and VZ inputs in standby mode (the valve enabled–disabled) are connected with CA and CZ outputs, which makes it possible, among other things, to carry out the damper ventilation function without any interruption.

Option with venting

CA and CZ outputs in standby mode are vented by means of an integrated drain (vent) valves. After pressurising the VA or VZ input (from the alarm or ventilation box), a connection between the VA input and CA output or between VZ input and CZ output is set up.

Thermal fuses

In TAVE and TAVZ thermal trips, only G5-RWA-xx thermal fuses, which were tested with the trips, can be used.

Colour of a thermal fuse defines the limit temperature		
G5-RWA-68, G8-RWA-68	Red	68°C
G5-RWA-93	Green	93°C
G5-RWA-141, G8-RWA-141	Blue	141°C

Thermal fuses.

The fuses with trigger temperature of **182°C, 260°C** are available.

> The nominal temperature of a thermal trip ampoule shall always be lower (or equal to) than the nominal temperature of the CO_2 cylinder.

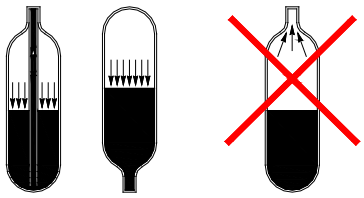
CO_2 Cylinders (Cartridges)

Cylinders with compressed CO_2 are the source of energy for the basic function of the smoke dampers with a pneumatic drive. They are equipped with safety valves. The connection thread is ½" UNF (extra-fine).

Photo 3. CO_2 cartridges.

When a cylinder with CO_2 has been punctured, the gas rapidly expands and stays cool at the same time. It may result in liquid CO_2 freezing inside the cylinder. In this state the gas cannot go out of the tank, so there will be not enough gas in the pneumatic system.

To prevent this phenomenon cylinders with CO_2 are mounted with the outlet at the bottom. Then, when the cylinder has been perforated, the gas pressure forces liquid gas through the valve to the pneumatic system made of tubes. In the system the liquid gas phase is quickly heated by the environmental heat and it becomes gas, without the risk of freezing.



The cylinders of different sizes are available:

Size (CO_2[g] content)	Dimensions [mm]	Nominal temperature [0C]	Charging efficiency (density) [g/ml]
20	26x115	93	0,54
24	26x115	68	0,65
38	30x144	93	0,58
40	30x144	68	0,62
55	35x159	93	0,58
75	30x205	50	0,74
80	35x217	93	0,57
120	50x178	93	0,56
150	50x178	68	0,70
300	50x315	50	0,71
500	60x342	50	0,75
750	60x490	50	0,71
1000	80x382	50	0,71
1500	80x525	50	0,75

AK alarm boxes

AKs are one of the main elements of the smoke damper control system. They make it possible to release gas energy in order to open a damper, in the following scenarios:

- Manual release – by pushing the black push button.
- Electric release – by applying nominal voltage to the electromagnet (with HEA and HEPA option only).
- Pneumatic release – by applying pneumatic triggering agent (e.g. CO_2) to the PA connection (with HEA/HEPA option only).

Photo 4. AK alarm boxes.

Due to the way of start-up there are four types of AK boxes:

HA – manual start-up

HEA – manual and electric start-up

HPA – manual and pneumatic start-up

HEPA – manual, electric and pneumatic start-up

Technical Data:

- Maximum operating pressure 80 bar,
- Nominal NW valve size 4 mm,
- Nominal NW pin size 2 mm,
- Operating temperature range -250 °C to +500 °C,
- Electromagnet nominal voltage 24 V DC,
- Electromagnet nominal current 0.29 A DC,
- Electromagnet operating time 100%,
- Minimum trigger pressure for HPA/HEPA version 5 bar.

The full marking of the AK box also contains the following information: the number of cylinders with CO_2 for opening and for closing, housing colour, box height and a holder for an additional cartridge.

The full marking includes the following elements:

AK 1 0. x – yy - .... - R

Where:

AK	**– alarm box**
1	**– number of cylinders with CO_2 for opening**
0	**– number of cylinders with CO_2 for closing**
X	**- box height**
yy	**– housing colour (RT – red, OR – orange)**
.....	**– way of start-up (HA, HEA, HPA, HEPA)**
R	**– holder for an additional cartridge**

Photo 5. AK box for a "A" type damper.

Photo 6. AK box for a "B" type damper.

Dimensions of single cylinder boxes.

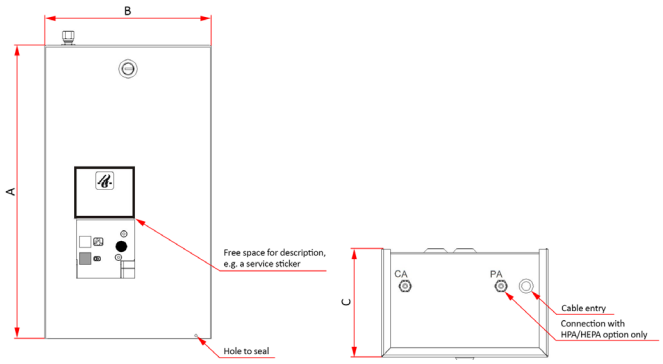


Figure 18. Dimensions of single cylinder boxes.

Dimensions of alarm boxes.

Type	A [mm]	B [mm]	C [mm]	Maximum cylinder size [g]
AK10.3	350	200	130	150
AK10.5	500	200	130	500
AK10.7	650	200	130	750
AK10.9	700	220	170	1500
AK11.3	350	300	130	150
AK11.5	500	300	130	500
AK11.7	650	300	130	750
AK11.9	700	320	170	1500

Box installation:

- Connect properly the box outputs.
- The cartridge has to be mounted with the thread directed down inside the box.
- It is recommended to use cylinders with CO_2 purchased from Smay Sp. z o.o. The certificate is only valid with these cartridges.

Conections:

CA ... "opening" actuators

CZ... "closing" actuators

PA ... pneumatic triggering (with HPA/HEPA option only)

PLZ Ventilation Boxes

PLZs are important elements of smoke damper control systems with a ventilation function. They make it possible to carry out the ventilation function, and – at the same time – to keep the priority of the smoke exhaust function.

The ventilation function is started by means of a manual lever loaded valve. It is possible to carry out the remote control function with an electric or pneumatic subassembly in A (opening), Z (closing) or AZ (opening-closing) operating mode.

In the alarm function, when gas appears on the alarm box input, the emergency power output is vented, and the ventilation function is disabled. After the emergency release, the state of readiness should be restored by means of a returnable push button.

Photo 7. PLZ ventilation box.

Technical Data:

- Maximum operating pressure 10 bar,
- Operating temperature range -20 °C to +60 °C,
- Ø6/4 pipe connection.

Types of PZL boxes:

For ventilation only:

- PLZ 10.0.1: 1 ventilation section with a lever externally accessible and a pressure regulator with a filter; dimensions: 300 x 200 x 80 mm.
- PLZ 10.0.2: 2 ventilation sections with two levers externally accessible and a pressure regulator with a filter; dimensions: 300 x 270 x 100 mm.

For A mode ("open only") + ventilation:

- PLZ 20.1.1: 1 section for A mode ("open only"), 1 ventilation section with a lever externally accessible and a pressure regulator with a filter; dimensions: 300 x 200 x 80 mm.
- PLZ 20.1.2: 1 section for A mode ("open only"), 2 ventilation sections with two levers externally accessible and a pressure regulator with a filter; dimensions: 300 x 270 x 100 mm.

For AZ mode ("open-close") + ventilation:

- PLZ 30.1.1: 1 section for AZ mode ("open-close"), 1 ventilation section with a lever externally accessible and a pressure regulator with a filter; dimensions: 300 x 200 x 80 mm.
- PLZ 30.1.2: 1 section for AZ mode ("open-close"), 2 ventilation sections with two levers externally accessible and a pressure regulator with a filter; dimensions: 300 x 270 x 100 mm.
- PLZ 30.2.2: 2 sections for AZ mode ("open-close"), 2 ventilation sections with two levers externally accessible and a pressure regulator with a filter; dimensions: 300 x 270 x 100 mm.

In designations of PZL boxes with a ventilation lever that is not accessible from the outer side, "1" is a second digit (PZL 11.x.x, PZL 21.x.x, PZL 31.x.x).

Other versions, including remote control (electric or pneumatic) are available on individual request.

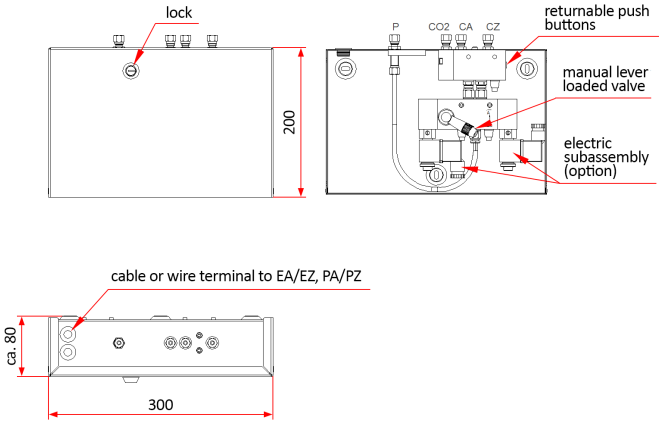


Figure 19. Dimensions of PLZ boxes.

Electric Ventilation Actuators

The drive for realizing the ventilation function is alternatively made by means of E-300-24, E-500-24, E-300-230, E-500-230 electric actuators from Grasl Pneumatik-Mechanik and K+G Pneumatik.

E-xxx-24 actuator

Photo 8. E300-24 actuator.

Technical Data:

- Supply voltage: 24 V,
- Current consumption: 650 mA,
- In order to ensure correct operation of the actuator in the end and overload position, power supply unit of each actuator should provide current higher than the nominal value by 20%.
- Feed force: 500 N when feeding, 250 N when pulling,
- Feed speed ca. 8 mm/s,
- Operating mode (EN 60034) S3 25% (control voltage can be provided continuously),
- Direct switching of the feed direction is forbidden (about 1 s break is required),
- Ingress Protection Rating (EN 60529): IP 54 (300 mm outreach),
- IP 33 (500 mm outreach),
- Ambient temperature: -10 °C to +60 °C
- Power cable: 2 x 0.75 mm^2,
- Load capacity: 24 V / 1 A.

The actuator is equipped with an overload circuit breaker. After the circuit breaker has been triggered, it is necessary to move the actuator back (start it in the opposite direction) before it can be restarted in the same direction as the limit switch triggered.

E-xxx-230 actuator

Photo 9. E300-230 actuator.

Technical Data:

- Supply voltage: 230 V~, 50 Hz,
- Current consumption 100 mA,
- Feed force: 500 N when feeding, 250 N when pulling,
- Feed speed ca. 10 mm/s,
- Operating mode (EN 60034) S3 25%,
- Ingress Protection Rating (EN 60529): IP 54 (300 mm outreach),
- IP 33 (500 mm outreach),
- Ambient temperature: -10 °C to +60 °C,
- Power cable: 3 x 1.5 mm^2,
- Load capacity: 230 V~ / 1 A.

The actuator is equipped with an overload circuit breaker. After the circuit breaker has been triggered, it is necessary to move the actuator back (start it in the opposite direction) before it can be restarted in the same direction as the limit switch triggered.

Pneumatic System

The gas pressure in the system after emergency release, may exceed 30 bar. For that reason it is very important to make the installation connecting individual elements of the pneumatic system very carefully. For this level of pressure it is recommended to make the installation of certified elements: Ø6/4 copper tubes, 10000-series screw connectors. Screw joints should be sealed with a Teflon tape or Loctite 243 glue for bolts.

To protect actuator fixing screws against loosening caused by vibrations, also use Loctite 243 glue.

Electric Drives

Configuration

Dampers with an electric drive are equipped with 24 V actuators. The same actuator supports emergency operation and ventilation functions.

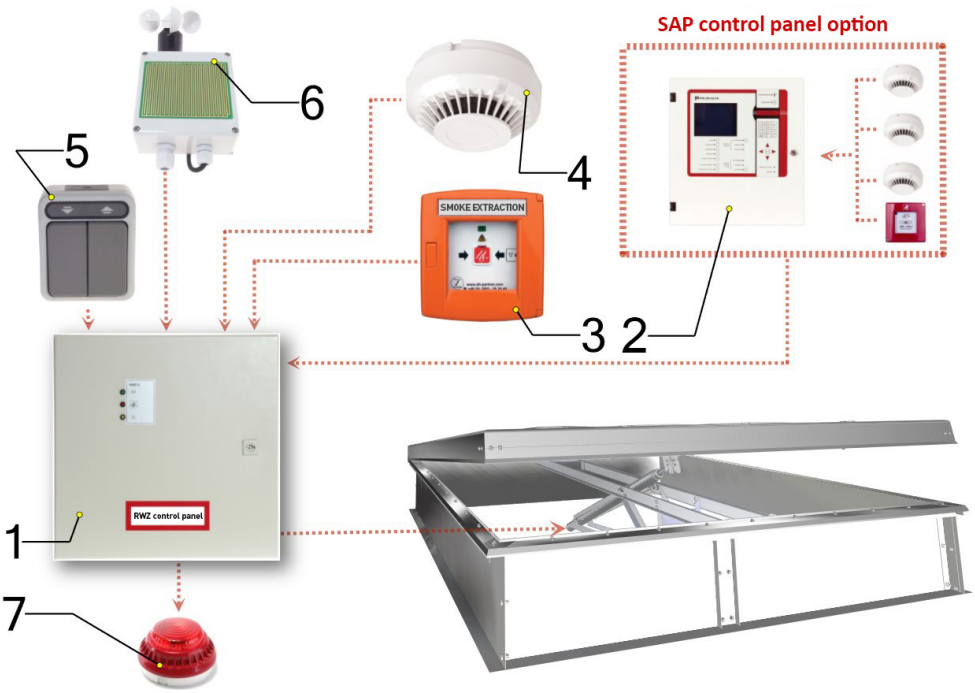
The elements of the system equipment are as follows: control panel, 24 V DC, Manual emergency push button.

Activation in emergency mode may take place:

- Automatically – by means of an electric signal, sent by smoke or temperature detectors.
- Automatically – from the Fire Alarm System (Polish acronym SAP).
- Manually – if fire has been noticed, a member of staff pushes the manual emergency push button.

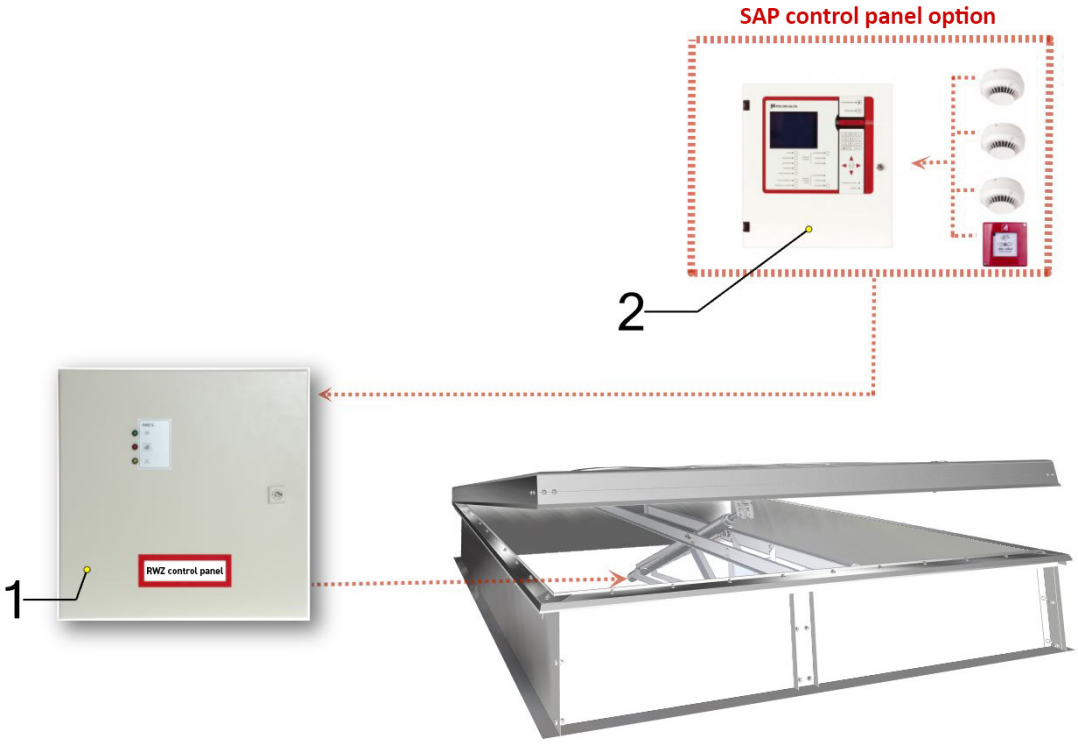
The continuity of power supply is imperative for this. Non-combustible cables are used to connect elements of the system.

Exemplary scheme of damper opening control as the function of smoke extraction and ventilation.



1. Smoke extraction system control panel.
2. SAP control panel.
3. Emergency push button.
4. Smoke detector.
5. Ventilation push button.
6. Weather station.
7. Alarm signalling device.

Figure 20. The "B" type damper with an electric actuator, control panel and weather control panel. Manual or automatic opening after the limit temperature has been reached or opening with SAP signal (with an electric module). Ventilation with an electric actuator.



1. Smoke extraction system control panel.
2. SAP control panel.

Figure 21. The "B" type damper with an electric actuator and control panel.

Manual or automatic opening after the limit temperature has been reached or opening with SAP signal (with an electric module). Ventilation with an electric actuator.

Electric Actuators

Depending on the damper size and required SL... parameter, the following types of actuators are dedicated: SG16.., SG20.., SG26.., SG40.., SG60.., SG80.., SG100.., SG120..

Photo 10. SG electric actuator.

The bodies of the actuators are made of anodised aluminium, and piston rod is made of aluminium, 1.4301 stainless steel or St52 galvanised steel. The actuators meet requirements for acceptable interference emission defined by EN 55011. Internal limit switches ensure turning off at end positions, and an electronic switch protects the device against overload. Parallel electric connection is also possible (without the speed synchronization). The standard size of the piston rod eye bolt is Ø8 (possible variants: Ø6, Ø10).

Every actuator has a cable in light grey silicon insulation, 2.5 m long:

- standard version: 2 x 2.5 mm² / OD ~ Ø9 mm
- for "E" option: 2 x 2.5 mm² / 3 x 1.5 mm² / OD ~Ø11 mm
- Options on request:
  - Actuator with a lower centre of suspension,
  - Other versions of the piston rod finishing,
  - Actuator housing painted to RAL colour.

"E" option – additional limit switches for both end positions, potential-free contact, closed for the end position. Load capacity 1 A / 24 V- (e.g. for the position indication).

The specific data of SG actuators are shown in Table 9.

Table 10. Specific data of SG actuators.

Parameter	Actuator type*							
	SG16..	SG20..	SG26..	SG40..	SG60..	SG80..	SG100..	SG120..
Supply voltage	24VDC							
Current consumption when operating without load	0,8 A							
Ambient temperature range	-25°C do + 60°C							
Maximum acceptable temperature according to EN 12101-2, Appendix G	300°C -30 min							
Ingress Protection Rating according to DIN EN 60529	IP 54							
Current consumption at full load [A]	1,6	2,0	2,6	4,0	6,0	8,0	10,0	12,0
Speed without load [mm/s]	6,2-20,8	6,2-20,8	6,2-20,8	6,7-36,7	21,9-36,8	30,3-36,8	17,1-25,6	17,1-25,6
Speed at full load [mm/s]	5,1-17,2	4,8-16,3	4,4-14,9	5,3-29,2	15,2-25,6	18,1-22,0	12,7-19,0	11,7-17,6
Operating mode at peak load, at 25°C	S2 4	S2 2,5	S2 1,5	S2 4	S2 2	S2 1	S2 2	S2 2
Operating mode at continuous load, at 40 °C	S3 21%	S3 13%	S3 8%	S3 20%	S3 10%	S3 5%		
Maximum activation time of the actuator in one direction [min]	4	2,5	1,5	4	2	1		

Ingress Protection Rating of the housing: IP 54

Operating temperature: -25 °C to +60 °C

Other important technical data concerning actuators are available on individual request.

Control Panel

The main purpose of the control panel is to control electric actuators of smoke ventilation systems. The smoke extraction is a priority function. The control panel makes it possible to carry out this function by manual or automatic activation, after emergency signal from a fire detector of SAP system has been received (the alarm can be reset by means of SAP). Moreover, they can carry out the ventilation function, in manual or programmable mode. The control panel can interoperate with an external weather station, therefore automatic damper closing is possible, when the weather is bad.

The control panels are equipped with batteries, which maintain emergency power supply.

In case of blackout it is not possible to charge the batteries, but they will provide power supply needed to maintain the panel operation. Blackout will not influence emergency functions.

A sac with fuses and spare resistors is placed inside the control panel.

Possible options:

- PK – sending alarm messages:
  - one pair of potential-free contacts to send emergency messages and one for failure messages.
- PK-SA Sending signals of the position indicator.
- WRM Internal weather control panel:
  - If it triggers, the actuators will automatically slide in. It is necessary to connect the WM anemometer and/or RS rain detector (accessories). In case of direct connecting detectors to the module in the control panel there is no need to connect the external weather control panel.
- The possibility of setting detectors sensitivity.
- "Close" command is active as long as the detector reacts, at least for 6 minutes.
- W wind indicator and R rain indicator on the module.
- CP External weather control panel: If it triggers, the actuators will automatically slide in. The ventilation functions are inactive till unlocked. Alarm signal has priority.
- WTM External warning devices control: Outputs for the external warning devices control in case of alarm or failure (e.g. MS multi-tone siren and BL flash lamp).

Types of Control Panels

RWZ 1b smoke extraction system control panel

Photo 11. RWZ 1b smoke extraction system control panel.

Technical parameters:

- One smoke extraction group – one ventilation group.
- Integrated system display.
- Supply current for actuators 4 A.
- Current consumption 0.7 A / 230 V~.
- Gel batteries, 2 x 2 Ah / 12 V, with VdS certificate.
- Charging I / U 0.2 A (28.8 V) / 27.4 V.
- Dimensions in mm (width x height x depth) 330 x 330 x 110.
- The requirements of EN 12101-10 and pr. EN 12101-9 are met.

Actuator output:

- Nominal voltage 24 V (+6 V / -4 V).
- Operating mode / ON time S3 30%.
- Power cable maximum cross-section 4 x 10 mm² (rigid).
- Maximum voltage drop between the control panel and the actuator 1 V (at full load).
- Wire line monitoring – open circuit, short circuit.
- (unbranched trunk cable).
- Possible options PK, WRM, CP.

Permissible cable length for straight, unbranched arrangement of actuators:

Cross-section [mm²]	Current [A]			
	1,0	2,0	3,0	4,0
	Permissible cable length [m]			
2 x 1,5	44	22	15	11
2 x 2,5	73	36	24	18
2 x 4,0	116	58	39	29
2 x 6,0	174	87	58	44
2 x 10,0	290	145	97	73

RWZ 4d smoke extraction system control panel

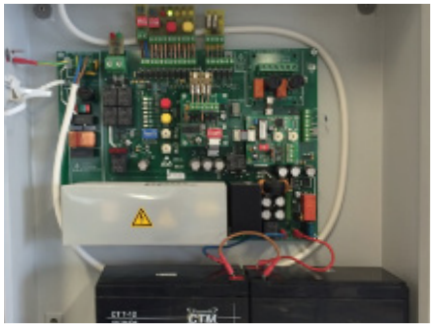


Photo 12. RWZ 4d smoke extraction system control panel.

Technical parameters:

- One smoke extraction group, one ventilation group.
- Integrated system display.
- Third signal line.
- Supply current for actuators 8 A.
- Current consumption 1.1 A / 230 V~.
- Gel batteries, 2 x 7 Ah / 12 V, with VdS certificate.
- Charging I / U 0.7 A (28.8 V) / 27.4 V.
- Dimensions in mm (width x height x depth) 400 x 400 x 125.
- The requirements of EN 12101-10 and pr. EN 12101-9 are met.

Actuator output:

- Nominal voltage 24 V- (+6 V / -4 V).
- Operating mode / ON time S3 30%.
- Power cable maximum cross-section 4 x 10 mm² (rigid)
- Maximum voltage drop
- between the control panel and actuator 1 V (at full load).
- Wire line monitoring – open circuit, short circuit (unbranched trunk cable).
- Possible options: PK, WRM, WTM, CP.

Table 11. Permissible cable length for straight, unbranched arrangement of actuators.

Cross-section [mm²]	Current [A]							
	1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0
	Permissible cable length [m]							
2x1,5	44	22	15	11	9	7	6	5
2x2,5	73	36	24	18	15	12	10	9
2,x4,0	116	58	39	29	23	19	17	15
2x6,0	174	87	58	44	35	29	25	22
2x10,0	290	145	97	73	58	48	41	36
4x1,5	87	44	29	22	17	15	12	11
4x2,5	145	73	48	36	29	24	21	18
4x4,0	232	116	77	58	46	39	33	29
4x6,0	348	174	116	87	70	58	50	44
4x10,0	580	290	193	145	116	97	83	73

When the four-core cable is used, connect the cores in parallel, two cores each.

RWZ 5e smoke extraction system control panel

Photo 13. RWZ 5e smoke extraction system control panel.

One or two smoke extraction groups, up to four ventilation groups.

Type	RWZ 5-8e	RWZ 5-16e	RWZ 5-24e	RWZ 5-32e
Total output current [A]	8	16 (2x8)	24 (3x8)	32 (4x8)
Current consumption	1,1 A/230 V~	2,2 A/230 V~	3,3 A/230 V~	4,4 A/230 V~
Gel batteries, with VdS certificate	2x7 Ah/12 V	2x12 Ah/12 V	2x17 Ah/12 V	
Charging I / U	0,7A(28,8V)/ 27,4 V	0,7A(28,8V) / 27,4 V	0,7A(28,8 V) / 27,4 V	
Dimensions in mm (width x height x depth)	500x500x210		600x600x210	
The requirements of EN 12101-10 and pr. EN 12101-9 are met				

Actuator output:

- Nominal voltage 24 V- (+6 V / -4 V).
- Current per each actuator output 8 A.

For RWZ 5-16:
Total current of actuators 1 and 2 max 8 A Total current of actuators 3 and 4 max 8 A.
For RWZ 5-24:
Total current of actuators 3 and 4 max 8 A.
Take into consideration the total output current of the control panel (Manual, chapter 6.1).

- Operating mode / ON time S3 30%.
- Power cable maximum cross-section 4 x 10 mm² (rigid) per each output.
- Maximum voltage drop between the control panel and the actuator 1 V (at full load).
- Wire line monitoring – open circuit, short circuit (unbranched trunk cable).
- Possible options: PK, PK-SA, WRM, WTM, CP.

Permissible cable length for straight, unbranched arrangement of actuators.

Cross-section [mm²]	Current [A]							
	1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0
	Permissible cable length [m]							
2 x 1,5	44	22	15	11	9	7	6	5
2 x 2,5	73	36	24	18	15	12	10	9
2 x 4,0	116	58	39	29	23	19	17	15
2 x 6,0	174	87	58	44	35	29	25	22
2 x 10,0	290	145	97	73	58	48	41	36
4 x 1,5	87	44	29	22	17	15	12	11
4 x 2,5	145	73	48	36	29	24	21	18
4 x 4,0	232	116	77	58	46	39	33	29
4 x 6,0	348	174	116	87	70	58	50	44
4 x 10,0	580	290	193	145	116	97	83	73

When the four-core cable is used, connect the cores in parallel in twos.

After approx. 24 hours of blackout-free operation, the batteries are charged enough to ensure full maintenance time in case of any failure.

The batteries operation should be checked at least once a year.

At 20 °C ambient temperature they should be replaced once per 3 years as a standard, but not later than after 4 years. Each additional 10 °C of ambient temperature decreases the battery service time by approx. 1 year!

Charged but disconnected batteries may be stored for approx. 6 months. In case of extended storage it is necessary to charge the batteries.

System Equipment

WRS 2B Weather Control Panel

Required signal is sent by four separate potential-free change-over contacts (output contacts). The contacts remain active as long as the detector operates, and the contact minimum operating time is equal to 6 minutes.

WM wind detector and/or RS rain detector are connected to WRS 2b control panel.

As expected, operation is achieved by adjusting the trigger threshold for the signal from the wind/smoke detector.

Functional capabilities of the control panel (to set) are as follows:

- Limited wind sensitivity (it is possible to close only if the wind persists).
- Continuous heating (the rain detector is heated continuously).
- Contact programming (contacts 3 and 4 optionally switch over during the rain and/or wind).
- Output inactive (relays are not energised for the service/maintenance time).
- Close time shortening (minimum delay in actuators closing is decreased from 6 to 3 minutes).
- Failure (contact 2 will switch in case of failure of the rain detector).
- Test (a function that makes it possible to test the detectors and actuators operation).

The active status of the control panel is indicated with a LED: I readiness, W wind and R rain.

Photo 14. WRS control panel.

Options/accessories:

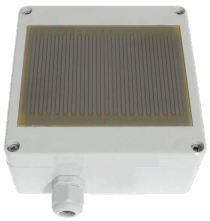
- WM 1: wind detector (an anemometer with a pinwheel) to measure the velocity of wind.
- RS 2: heated rain detector.
- SK: rack bracket (a mast, 40 cm in height) for installation of WM and RS detectors on a flat roof.
- MB: a fastening member for WM and RS detectors to mount them to a mast (to Ø60 mm pipe).
- KE: Expansion with additional potential-free contacts.
- SG: a housing with the door made of clear plastic, opening to the left side, IP54.

The control panel is not suitable for outdoor use. Protect against direct sunlight, humidity and excessive dust! It is recommended to mount the product in dry and heated rooms.

Technical parameters:

- Supply voltage 230 V~ / 50-60 Hz.
- Current consumption 0.09 A.
- Dimensions in mm (width x height x depth) 165 x 155 x 75, 200 x 155 x 95 (for the SG option).
- Operating temperature -50 °C to +400 °C.
- Relative humidity of air 20% to 80%, without condensation.
- Housing Ingress Protection Rating IP 40; IP 54 (for the SG option).

Accessories of the Weather Station



RS 2d

PA heated rain detector (the heater is activated after the detector's response, and deactivated after drying), about 80 cm² area of the sensor with a fixing console.

WM 1

An anemometer (cup type, rotational) for measuring the wind velocity.

RS 2d-WM 1

A combination of RS 2d and WM 1 detectors described above, installed to a mounting angle profile.

MB

Clamps for RS 2 and WM 1 polar elements mounting (the pipe diameter is equal to 60 mm).

SK

A rack (40 cm high) for 2 and RS WM 1 elements mounting on a flat roof.

OSD63 Smoke and Heat Detector

Photo 15. OSD63 smoke detector.

Technical Data:

- CNBOP-PIB 1438-CPR-0452 certificate.
- PN-EN 54-5:2000 + A1:2002.
- PN-EN 54-7:2000 + A1:2002 + A2:2006.
- A1R detector class.
- Monitoring voltage from 10 V to 30 V.
- Monitoring current 35 uA.
- Standard alarm current 20 mA (adjustable).
- Red LED optic indicators – signalling the operation status.
- Operating temperature range from -25 °C to +50 °C.
- Storage temperature range from -30 °C to +70 °C.
- Relative humidity 95%, at +40 °C.
- Detector weight (with a socket) 0.12 kg.
- Dimensions – 50 mm in height, 110 mm in diameter.

The OSD63 point detector is designed for detecting the early stage of propagation of fire. It may be used in conventional and addressable alarm systems, and smoke extraction systems.

It is characterized by multilevel security controls against false alarms. Advanced algorithms for detecting environmental conditions inform the detector about the initial stage of fire.

It has an integrated algorithm for auto-compensation to protect against dirt. The OSD63 can operate in the low current consumption mode, in the monitoring state – 35 uA, and in the wide range of supply voltages 10-30 V.

It is possible to turn off selected sensors (a detector operates as optic / temperature / multisensor one).

Information about the detector status is presented by means of two optic indicators – monitoring, alarm type, dirt status, failure status.

Functional features:

- The possibility of configuring the detector with free software from the PC level (USB) – a dozen or so parameters.
- Very easy detector cleaning (disassembling and assembling without any tools).
- Temperature sensors are mechanically protected, also during cleaning.
- Mechanical protection against unauthorized plug-out of the detector from the socket.
- Connecting cables to the detector socket by means of spring clamps (for YnTKSY cables without any tools) – eliminated effect of poor contact of typical screw clamps.

SA-K6 sounder

Photo 16. SA-K6 sounder.

Photo 17. WSD-1 acoustic signal switch.

It is designed for acoustic signalling in fire detection systems, in closed spaces. There is the possibility of selecting one out of 4 acoustic signals.

Using WSD-1 you can turn off the sound signal and leave the optical signal alone.

Technical data:

- Type of signalling device: acoustic.
- Supply voltage 16-32.5 V DC.
- Quiescent current 0 mA.
- Current consumption at alarm state < 65 mA.
- Sound intensity at the distance of 1 m > 100 dB.
- Operating temperature range from -25 °C to +55 °C.
- IP 21C Ingress Protection Rating of the housing.
- Weight ~184 g.
- Dimensions Ø115 x 70 mm.
- Interoperating junction box PIP-1AN.

SO-PD11 Optical Indicator

Photo 18. SO-Pd11 optical indicator.

It is designed for optical signalling with a set of LEDs in fire detection systems.

The indicator is mounted in the system in closed spaces. It generates three different flash rates. It is possible to turn on the continuous light.

Technical data:

- Type of signalling device: optical.
- Supply voltage 24 V DC.
- Quiescent current 0 mA.
- Current consumption at alarm state < 60 mA.
- IP 53D Ingress Protection Rating of the housing.
- Weight ~150 g.
- Dimensions Ø115 x 63 mm.
- Interoperating junction box PIP-3AN.

RT 2 Emergency Push Button

Photo 19. SO-Pd11 optical indicator.

The RT 2 smoke extraction push button is used for manual alarm triggering in smoke extraction systems.

In the RT 2-K version the push button has one LED indicator – the red one, which indicates ALARM. In the RT 2-K-BS version the push button has three LED indicators: the red one – ALARM, the yellow one – DAMAGE, and the green one – OK.

The push button should be located at a place, where it would be easily accessible for users and service teams, preferably at/near escape routes. Electric connections should be made by authorized persons.

The alarm is triggered by pushing the emergency push button, after breaking the glass in the housing. In order to cancel the alarm release the push button mechanical lock after opening the housing.

Ventilation push button

Photo 20. Ventilation push button.

The LT-AP push button makes it possible to control the ventilation function in a comfortable and safe way. It is made as a surface-mounted element.

Technical data:

- Maximum contact load 10 A / 250 V AC.
- IP44 Ingress Protection Rating of the housing.
- Light grey colour.

Delivery/Transport

Individual elements of SCD smoke dampers are transported on pallets or in factory-made packages. Between the elements being in touch there are spacers made of cardboard or stretch foil. Individual packets are placed in wooden containers or on pallets. Small elements and made-up fixings are delivered in the foil packaging or in cardboard boxes. During transport all elements should be protected against moving and weather conditions.

After every delivery it is necessary to carry out the visual inspection of individual elements of the set. Do not expose to mechanical damage.

The elements of SDS smoke dampers should be stored in closed spaces, providing protection against weather conditions, where:

- Relative humidity φ < 80% at t = 20 °C.
- Ambient temperature -20 °C < t < +60 °C.
- The elements should not be in any contact with dust, gas and corrosive vapours nor other substances that could cause corrosion.

Installation

SCD dampers are designed for mounting onto flat roofs slanted at not more than 15°. They are delivered as sets of matched elements, which makes the trouble-free mounting possible. In exceptional cases the dampers may be delivered ready-assembled. In such a case, due to the comfort and safety of transport, the deflectors are delivered separately. The thermal trip unit and, possibly, E ventilation actuator are delivered separately, too.

Before putting the device into service all delivered elements shall be mounted definitely, according to the Installation Manual.

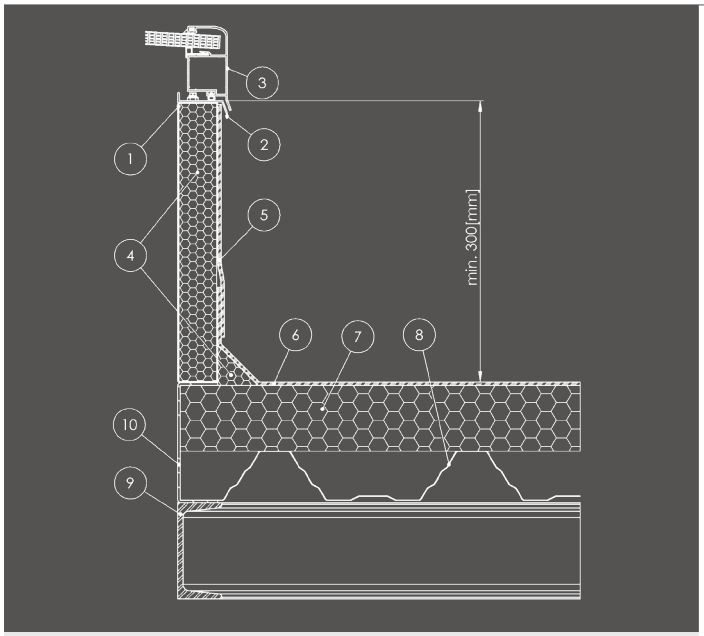
When unloading it is necessary to check the compliance of delivery with element specifications. Unloading should be done manually or by means of standard warehouse equipment, observing all valid safety rules.

Before mounting in a system check the elements of SCD dampers for mechanical damage. Send any defective elements back to the Manufacturer in order to have them assessed in terms of any repair options and repaired if possible.

Independent repair of damaged elements of SCD dampers is forbidden.

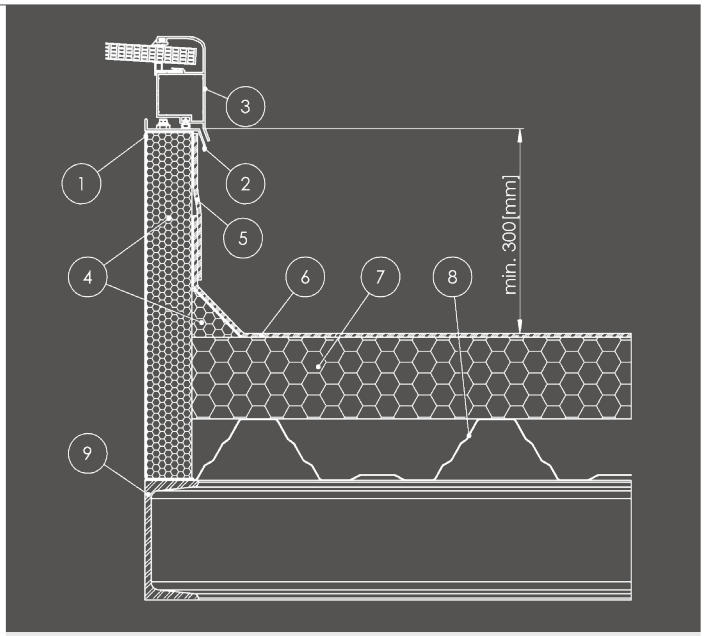
Every supply includes: Element specification, Operating and Maintenance Manual and Installation Manual.

Examples of Mounting SCD Smoke Dampers on Typical Roofs



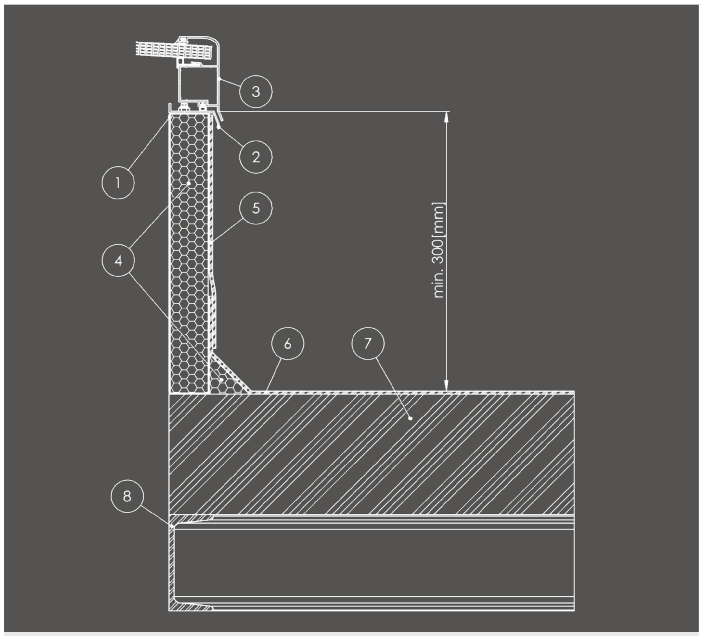
1. Smoke damper base made of galvanised steel sheet.
2. Smoke damper drainpipe.
3. Smoke damper profile.
4. Thermal insulation.
5. Smoke damper damp insulation.
6. Roof damp insulation.
7. Thermal insulation.
8. Steel decking.
9. Roof girder – roof structure.
10. Supporting structure.

Figure 22. SCD smoke damper mounting on an insulated steel roof, without any substructure, under the profiled sheet metal.



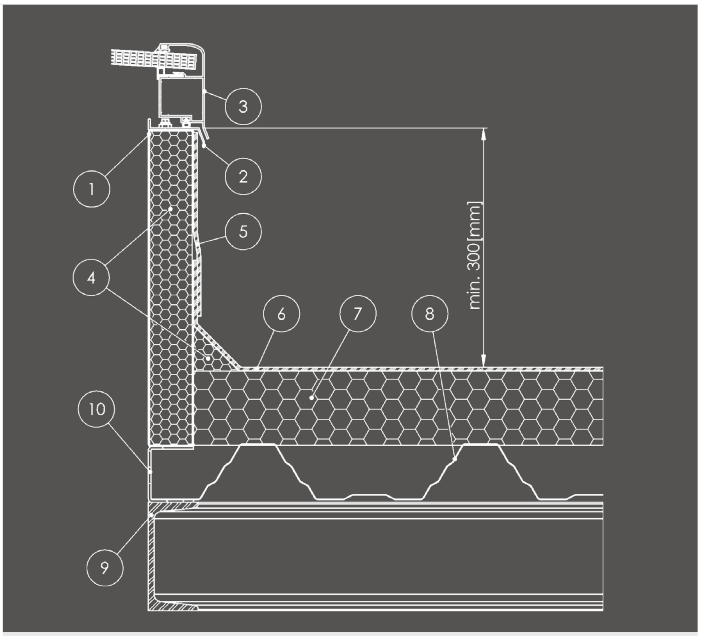
1. Smoke damper base made of galvanised steel sheet.
2. Smoke damper drainpipe.
3. Smoke damper profile.
4. Thermal insulation.
5. Smoke damper damp insulation.
6. Roof damp insulation.
7. Thermal insulation.
8. Steel decking.
9. Roof girder – roof structure.

Figure 23. SCD damper mounting on an insulated steel plinth with a substructure, under the insulation layer.



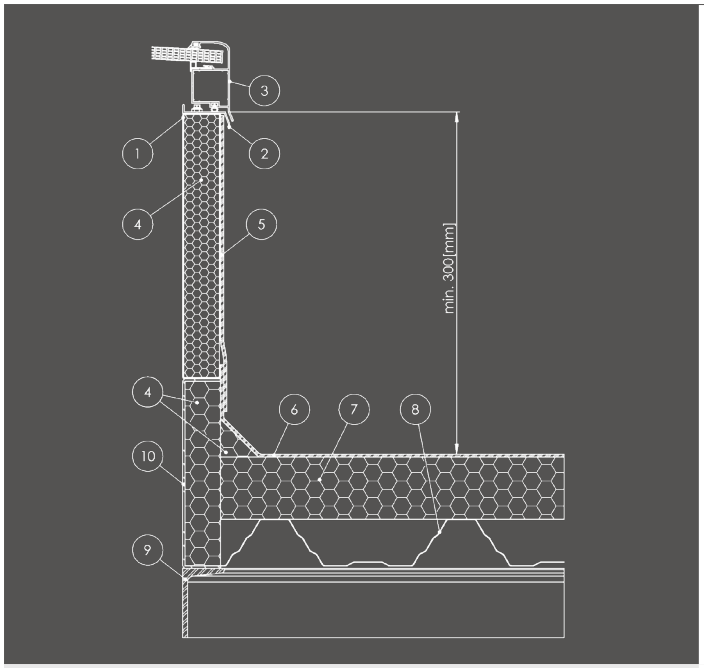
1. Smoke damper base made of galvanised steel sheet.
2. Smoke damper drainpipe.
3. Smoke damper profile.
4. Thermal insulation.
5. Smoke damper damp insulation.
6. Roof damp insulation.
7. Steel/concrete floor.
8. Roof girder – roof structure.

Figure 24. SCD damper mounting on a reinforced concrete roof.



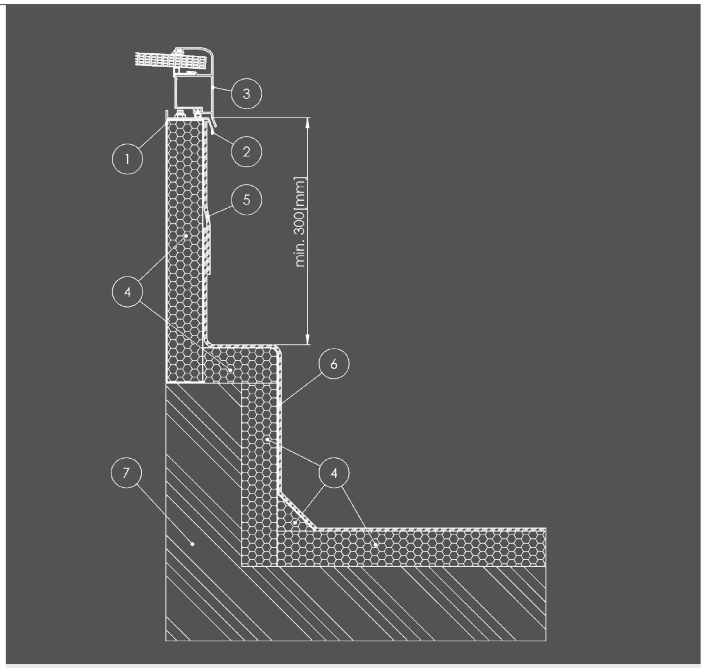
1. Smoke damper base made of galvanised steel sheet.
2. Smoke damper drainpipe.
3. Smoke damper profile.
4. Thermal insulation.
5. Smoke damper damp insulation.
6. Roof damp insulation.
7. Thermal insulation.
8. Steel decking.
9. Roof girder – roof structure.
10. Supporting structure.

Figure 25. SCD damper mounting on an insulated steel roof, with a substructure, over the insulation layer.



1. Smoke damper base made of galvanised steel sheet.
2. Smoke damper drainpipe.
3. Smoke damper profile.
4. Thermal insulation.
5. Smoke damper damp insulation.
6. Roof damp insulation.
7. Thermal insulation.
8. Steel decking.
9. Roof girder – roof structure.
10. Supporting structure.

Figure 26. SCD damper mounting on an insulated steel plinth with a substructure over the insulation layer.



1. Smoke damper base made of galvanised steel sheet.
2. Smoke damper drainpipe.
3. Smoke damper profile.
4. Thermal insulation.
5. Smoke damper damp insulation.
6. Roof damp insulation.
7. Steel/concrete floor.

Figure 27. SCD damper mounting on a reinforced concrete plinth.

The information about the installed SCD smoke damper should be placed on the device or recorded in the Construction Site Log. This information must include the following data:

- Damper manufacturer's name,
- Smoke damper name according to the certificate – type and model,
- Year of production,
- Technical properties of the external energy source,
- Trigger temperature of the thermal trip (if mounted),
- Active area,
- Classes of: snow load, wind load, efficiency at low temperatures, reliability and resistance to high temperatures,
- Number and year of issue of the European Standard connected with the given certificate,
- Name of the company, which has mounted the damper,
- Damper mounting date.

After the device and the control system have been mounted, before commissioning of the smoke damper, it is recommended to carry out and note the following actions:

- Check the electric and pneumatic system for mechanical damages,
- Check the state of electric/pneumatic connections between individual elements,
- Check the thermal insulation and joint seals for the moisture permeability,
- Check the movement abilities for all control variants,
- Check the device, particularly the polycarbonate cover and drive mechanical members, for cleanness,
- Check all labels and stickers for readability.

During operation, SCD smoke dampers shall be inspected at least every 12 months, with the inspection recorded in an inspection report. Otherwise it will be impossible to accept and authorise the damper.
During the periodic inspection all actions recommended by the Operating and Maintenance Manual should be conducted.

Dampers may only be installed by companies trained by Smay Sp. z o.o. within the range of the product technical properties, terms and conditions of installation work, and the inspection of performed works.

Workers should have personal certificates issued by Smay Sp. z o.o, with the authorization for mounting SCD dampers. The certificate is valid for 3 years after training. Moreover, they should have certified expert qualifications, appropriate for the given scope of work, as well as certificates for carrying out operations under specific environmental conditions.
Mounting the dampers should be carried out precisely in accordance with the Installation Manual, with the use of materials specified in this manual only.

Table 12. Declared active areas for single leaf dampers.

Positions	Nominal dimensions		SCD-1-P... damper with a straight base						SCD-1-S... damper with a sloping base					
			Base height [mm]						Base height [mm]					
			700		500		350		700		500		350	
			Deflectors						Deflectors					
	w [mm]	l (hinges) [mm]	no	yes*	no	yes*	no	yes*	no	yes*	no	yes*	no	yes*
			Aa active area [m²]						Aa active area [m²]					
1	1000	1000	0,69		0,68		0,66		0,68		0,67		0,66	
2	1000	1200	0,83		0,80		0,79		0,80		0,80		0,79	
3	1000	1300			0,87		0,86		0,87		0,87		0,86	
4	1000	1400			0,94		0,91		0,94		0,94		0,92	
5	1000	1500	1,02		1,01		0,98		1,01		1,01		0,99	
6	1000	1600			1,07		1,04		1,07		1,07		1,06	
7	1000	1700	1,16		1,14		1,11		1,14		1,14		1,12	
8	1000	1800	1,22		1,19		1,17		1,21		1,21		1,19	
9	1000	1900			1,25		1,24		1,25		1,25		1,25	
10	1000	2000	1,36		1,32		1,30		1,32		1,32		1,32	
11	1000	2200	1,47		1,45		1,41		1,45		1,45		1,43	
12	1000	2300	1,54		1,52		1,47		1,52		1,52		1,50	
13	1000	2400	1,61		1,58		1,54		1,56		1,56		1,51	1,54
14	1000	2500	1,68		1,65		1,60		1,63		1,63		1,55	1,60
15	1100	1100	0,83		0,81		0,80		0,82		0,81		0,80	
16	1100	2000	1,47		1,45		1,41		1,45		1,45		1,45	
17	1150	1150	0,91		0,89		0,87		0,90		0,89		0,87	
18	1150	2000	1,54		1,52		1,47		1,52		1,52		1,52	
19	1200	1200	0,98		0,96		0,94		0,98		0,96		0,95	
20	1200	1500	1,22		1,19		1,17		1,21		1,21		1,19	
21	1200	1700	1,39		1,35		1,33		1,37		1,37		1,35	
22	1200	1800	1,47		1,43		1,38		1,45		1,45		1,43	
23	1200	2000	1,61		1,58		1,54		1,58		1,58		1,58	
24	1200	2200	1,77		1,72		1,69		1,74		1,74		1,72	
25	1200	2300	1,85		1,79		1,77		1,82		1,82		1,79	
26	1200	2500	2,01		1,95		1,92		1,98		1,95		1,86	1,92
27	1250	1250	1,06		1,05		1,02		1,06		1,05		1,03	
28	1250	2500	2,09		2,03		1,97		2,06		2,03		1,94	2,03
29	1300	1300	1,15		1,13		1,10		1,15		1,13		1,12	
30	1300	1500	1,33		1,29		1,27		1,31		1,31		1,29	
31	1300	1600	1,41		1,37		1,33		1,39		1,39		1,37	
32	1300	1800	1,57		1,54		1,50		1,57		1,57		1,54	
33	1300	1900	1,65		1,63		1,58		1,65		1,65		1,63	
34	1300	2000	1,74		1,69		1,66		1,72		1,72		1,72	
35	1300	2200	1,92		1,86		1,83		1,89		1,89		1,86	
36	1300	2500	2,15		2,11		2,05		2,15		2,11		2,02	2,11
37	1400	1400	1,33		1,29		1,27		1,33		1,31		1,29	
38	1400	1500	1,43		1,39		1,34		1,41		1,41		1,39	
39	1400	1800	1,69		1,64		1,61		1,69		1,69		1,66	
40	1400	2000	1,88		1,82		1,76		1,85		1,85		1,85	
41	1400	2500	2,31		2,28		2,21		2,31		2,28	2,31	2,14	2,28
42	1450	1450	1,43		1,39		1,35		1,43		1,41		1,39	
43	1500	1500	1,53		1,49		1,44		1,53		1,51		1,49	
44	1500	1700	1,71		1,66		1,63		1,71		1,71		1,68	
45	1500	1800	1,81		1,76		1,70		1,81		1,81		1,78	
46	1500	2000	2,01		1,95		1,89		1,98		1,98		1,98	

Positions	Nominal dimensions		SCD-1-P... damper with a straight base						SCD-1-S... damper with a sloping base					
			Base height [mm]						Base height [mm]					
			700		500		350		700		500		350	
			Deflectors						Deflectors					
	w [mm]	l (hinges) [mm]	no	yes*	no	yes*	no	yes*	no	yes*	no	yes*	no	yes*
			Aa active area [m²]						Aa active area [m²]					
47	1500	2200	2,18		2,15		2,08		2,18		2,18		2,15	
48	1500	2300	2,28		2,24		2,17		2,28		2,28		2,24	
49	1500	2500	2,48		2,44		2,36		2,48		2,44	2,48	2,29	2,44
50	1500	2700	2,67		2,59		2,55		2,67		2,59	2,67	2,43	2,63
51	1500	3000	2,97		2,88		2,79		2,97		2,88	2,97	2,66	2,93
52	1600	1600	1,72		1,66		1,64		1,74		1,72		1,69	
53	1600	1700	1,82		1,77		1,71		1,82		1,82		1,80	
54	1600	1800	1,93		1,87		1,81		1,93		1,93		1,90	
55	1600	2000	2,11		2,08		2,02		2,14		2,11		2,11	
56	1600	2200	2,32		2,29		2,22		2,36		2,32		2,29	
57	1600	2300	2,43		2,36		2,32		2,47		2,39	2,43	2,32	2,39
58	1600	2500	2,64		2,56		2,52		2,68		2,60	2,64	2,44	2,60
59	1600	2700	2,85		2,76		2,72		2,89		2,76	2,85	2,59	2,81
60	1600	3000	3,12		3,07		2,98		3,22		3,02	3,17	2,78	3,12
61	1700	1700	1,94		1,88		1,82		1,97		1,94		1,91	
62	1700	1800	2,05		1,99		1,93		2,05		2,05		2,02	
63	1700	2000	2,24		2,18		2,14		2,28		2,24		2,24	
64	1700	2200	2,47		2,39		2,36		2,51		2,47		2,43	2,47
65	1700	2300	2,58		2,50		2,46		2,62		2,54	2,58	2,46	2,58
66	1700	2500	2,81		2,72		2,64		2,85		2,76	2,81	2,59	2,81
67	1700	2700	3,03		2,94		2,85		3,08		2,94	3,03	2,75	2,98
68	1700	3000	3,32		3,26		3,16		3,42		3,21	3,37	2,96	3,32
69	1800	1800	2,14		2,07		2,04		2,20		2,17		2,14	
70	1800	2000	2,38		2,30		2,23		2,41		2,38		2,38	
71	1800	2200	2,61		2,53		2,46		2,65		2,61		2,53	2,61
72	1800	2300	2,73		2,65		2,57		2,77		2,69	2,73	2,61	2,73
73	1800	2500	2,97		2,88		2,79		3,02		2,88	3,02	2,75	2,97
74	1800	2700	3,16		3,11		3,01		3,26		3,11	3,26	2,92	3,21
75	1800	3000	3,51		3,46		3,35		3,62		3,40	3,62	3,13	3,56
76	1920	1900	2,41		2,33		2,26		2,48		2,44		2,41	
77	1920	2000	2,53		2,46		2,38		2,61		2,57		2,53	
78	1920	2200	2,79		2,70		2,62		2,87		2,75	2,83	2,70	2,79
79	1920	2300	2,91		2,83		2,74		3,00		2,87	2,96	2,78	2,91
80	1920	2500	3,12		3,07		2,98		3,26		3,07	3,22	2,93	3,17
81	1920	2700	3,37		3,32		3,21		3,53		3,32	3,47	3,06	3,42
82	1920	3000	3,74		3,69		3,57		3,92		3,63	3,86	3,28	3,80

*If the field is empty, a deflector is optional.

Table 13. Declared active areas for double leaf dampers.

Positions	Nominal dimensions		SCD-1-P... damper with a straight base						SCD-1-S... damper with a sloping base					
			Base height [mm]						Base height [mm]					
			700		500		350		700		500		350	
			Deflectors						Deflectors					
	w [mm]	l (hinges) [mm]	no	yes*	no	yes*	no	yes*	no	yes*	no	yes*	no	yes*
			Aa active area [m²]						Aa active area [m²]					
1	1250	2500	2,09		2,03		1,97		2,16		2,13		2,06	
2	1500	1500	1,53		1,49		1,42		1,44	1,55	1,42	1,53	1,35	1,51
3	1500	2500	2,51		2,44		2,36		2,51	2,59	2,44	2,55	2,36	2,48
4	1500	3000	3,02		2,93		2,84		3,11		3,02	3,06	2,88	2,97
5	1600	1600	1,74		1,69		1,61		1,64	1,77	1,59	1,74	1,51	1,72
6	1600	2500	2,68		2,60		2,52		2,68	2,76	2,56	2,72	2,44	2,64
7	1600	2800	3,00		2,91		2,82		3,00	3,09	2,91	3,05	2,78	2,96
8	1600	3000	3,22		3,12		3,02		3,31		3,17	3,26	3,02	3,17
9	1800	1600	1,90	1,96	1,90		1,81		1,81	1,99	1,73	1,96	1,61	1,93
10	1800	1800	2,14	2,20	2,04	2,14	1,98	2,04	2,04	2,24	1,94	2,20	1,85	2,17
11	1800	2500	2,97	3,02	2,84	2,93	2,75	2,84	2,93	3,11	2,79	3,06	2,66	2,97
12	1800	2800	3,33	3,38	3,18	3,28	3,07	3,18	3,33	3,48	3,18	3,43	3,02	3,33
13	1800	3000	3,56	3,62	3,40	3,51	3,29	3,40	3,56	3,73	3,40	3,67	3,24	3,56
14	2000	2000	2,60	2,72	2,48	2,64	2,40	2,52	2,52	2,76	2,36	2,72	2,16	2,68
15	2000	2400	3,12	3,26	2,98	3,12	2,88	3,02	3,02	3,31	2,88	3,26	2,69	3,22
16	2000	2500	3,25	3,35	3,10	3,25	3,00	3,15	3,15	3,45	3,00	3,40	2,80	3,30
17	2000	2800	3,64	3,75	3,47	3,64	3,36	3,53	3,58	3,86	3,42	3,81	3,19	3,70
18	2000	3000	3,90	4,02	3,72	3,90	3,60	3,78	3,84	4,14	3,66	4,08	3,48	3,96
19	2200	2200	3,10	3,29	2,95	3,19	2,86	3,05	3,00	3,34	2,76	3,29	2,52	3,24
20	2200	2400	3,38	3,59	3,22	3,43	3,12	3,33	3,27	3,64	3,06	3,59	2,80	3,54
21	2200	2500	3,52	3,69	3,36	3,58	3,25	3,47	3,41	3,80	3,19	3,74	2,97	3,63
22	2400	2400	3,63	3,92	3,46	3,80	3,34	3,63	3,46	3,97	3,23	3,92	2,94	3,86
23	2400	2500	3,78	4,08	3,60	3,90	3,42	3,78	3,60	4,14	3,36	4,08	3,06	4,02
24	2500	2500	3,94	4,25	3,75	4,13	3,56	4,00	3,69	4,31	3,44	4,25	3,13	4,19
25	2500	3000	4,73	5,03	4,50	4,88	4,20	4,80	4,50	5,18	4,20	5,10	3,83	4,95
26	3000	3000	5,49	6,03	5,13	5,94	4,77	5,85	4,95	6,21	4,50	6,12	4,05	5,94

SCD - Smoke Dampers and Accessories

When ordering, please provide information in accordance with the following pattern:

SCD - <R> - <E> - <w> x <l> - <h> - <D> - <N> - <F> - <TP> - <GW> - <SL> - <T> - <$B_{ROOF}(t_1)$> - <ADD>

Where:

R	Damper type
	1 - Single leaf
	2 - double leaf
E	Base type
	P - straight
	S - sloping
W	Damper width
L	Damper lenght
H	Base height
	350,500,700
D	Deflectors
	none - no deflectors
	0 - with deflectors
N	Emergency drive
	Pn - pneumatic
	El - electric

F	Function
	FD - single function – smoke extraction only (only dampers)
	FDW - double function – smoke extraction + ventilation with an electric drive
	FDWp - double function – smoke extraction + ventilation with a pneumatic drive
TP	Operating mode
	A - open only
	B - open – close
GW	Thickness of PC filling
	10, 16, 20, 25
SL	Snow load classification
	SL2 – SL550 classification; SL1 – SL1000 classification
T	Temperature classification
	T0 – T(00) classification; T1 – T(-05) classification; T2 – T(-15) classification; T3 – T(-25) classification
$B_{ROOF}(t_1)$	Declaration of classification
	none - no declaration of classification
	$B_{ROOF}(t_1)$ - declaration of classification

ADD Accessories

ADD	Accessories
	AK - alarm box (for pneumatic systems)
	PLZ - ventilation-alarm box (for pneumatic systems)
	WRS 2b - weather control panel
	RS 2d - rain detector
	WM 1 - anemometer
	RS 2d-WM1 - detector set (rain detector + anemometer)
	MB - mounting clamp
	SK - rack
	RWZ... - RWZ electric control panel
	RWZ 1b (4 A), RWZ 4d (8 A), RWZ 5-8e (8 A), RWZ 5-16e (16 A), RWZ 5-24e (24 A), RWZ 5-32e (32 A)
	ET-xxx - thermoactive element (xxx – size and temperature – selected as required)
	BT-xxxx - CO_2 cylinder (xxx – volume selected as required)
	KA - anti-burglar bars
	KZU - anti-fall grate

Order example: **SCD-1-P-1500x1500-350-El-FDW-B-16-SL2-T3-KA**

SCD-1-W-<w>x<l>-<h>-<D>-<GW> <ADD>

Where:

w	Damper width
l	Damper lenght
h	Base height: 350, 500, 700
D	Deflectors
	none - no deflectors
	0 - with deflectors
GW	thickness of PC filling: 10, 16, 20, 25
ADD	specify additional accessories here, as below

Akcesoria:

WRS 2b	weather control panel
RS 2d	rain detector
WM 1	anemometer
RS 2d-WM1	detector set (rain detector + anemometer)
MB	mounting clamp

SK	rack
KA	anti-burglar bars
KZU	anti-fall mesh

Order example: **SCD-1-W-1200X1200-350-16-RWZ 4d**