SDS
SINGLE FIRE ZONE SMOKE CONTROL DUCTS

Characteristics:
SDS steel smoke control ducts are a set of products for making single-zone, horizontal, rectangular smoke control systems of max. section 2500x1500mm using round elements up to 1250 mm diameter.

Designation

Single fire zone smoke control ducts of SDS type are designed for smoke and heat extraction in systems controlling spreading of smoke and heat within one fire zone.

SDS ducts may be used in dual-function systems (which simultaneously serve as general and smoke exhaust ventilation), provided that in the smoke control function they serve only the zone, in which they are installed. They can be a stand-alone installation and can be combined with a multi-zone installation.

SDS ducts may only be mounted in a horizontal position. These ducts can be used to carry gases of the temperature not exceeding 600°C. The permissible operating pressure range is from -1500Pa under pressure to +500Pa overpressure.

Classification

SDS steel single fire zone smoke control ducts are classified according to the criteria of PN-EN13501-4:2016-07P (large size), PN-EN 13501-4+A1:2010 (standard) in class E600120(h0)S1500single fire resistance, and as non-flammable and non-fire-spreading.

Execution

Ducts and fittings of SDS type are made of galvanized steel tinware. Straight sections and fittings are finished with flanged connections with 30 or 40 mm wide profile frames. Profiles with a width of 30 mm are used when both the width and height of the fitting do not exceed 1250 mm.

The approximate mass of ducts is 15kg/m2 of tinware surface.

Compensation of ducts elongation

Expansion duct elements or rectangular expansion joints should be used for ducts longer than 5m. The maximum permissible distance between expansion joints must not exceed 10m. The use of other compensators is not allowed. The SDS-KE expansion joints are connected to other components using standard P30 or P40 frames.

An example installation scheme is shown in Figure 1.

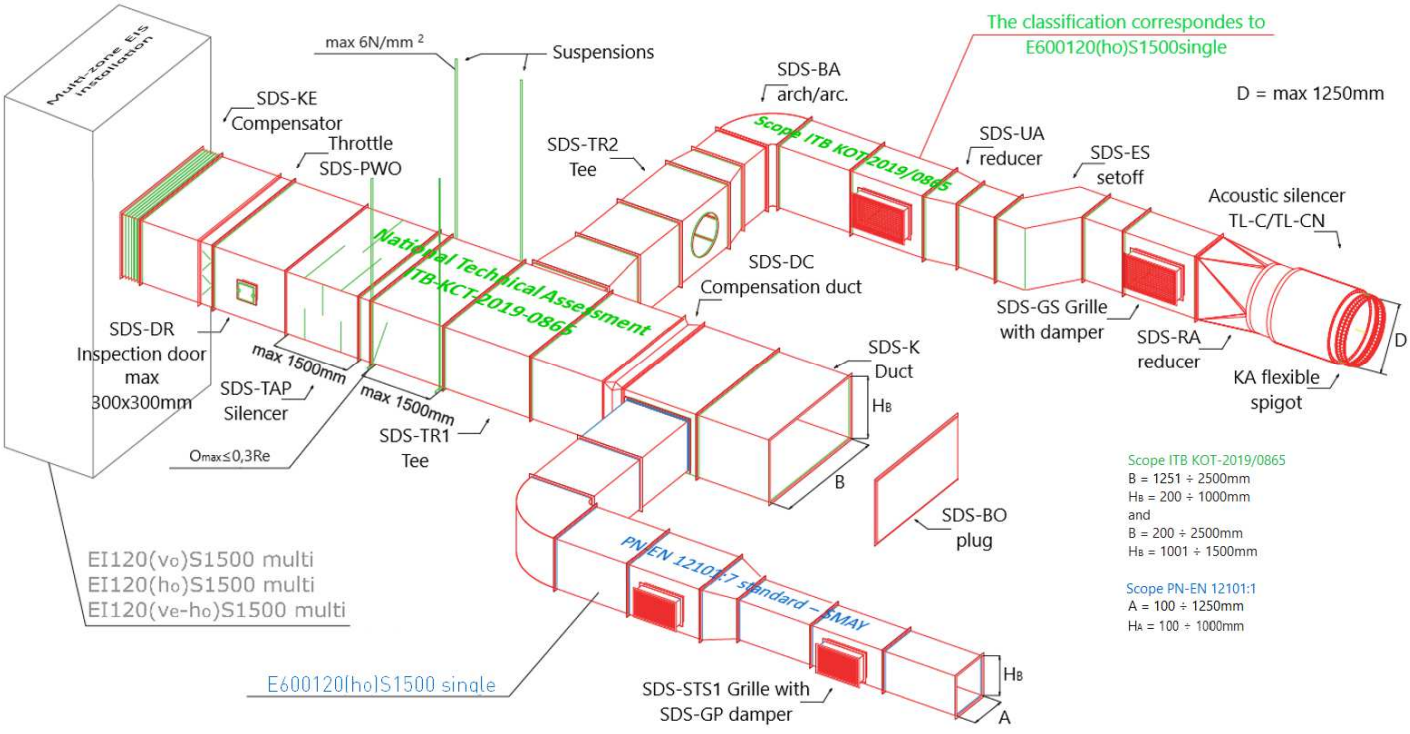


Figure 1. Scheme of a smoke control system made of SDS elements.

Insulation

In order to save energy of reduce noise emissions, it is possible to insulate SDS units when using them for general ventilation. Insulation shall be made only on the external surface of the ducts in such a manner as to ensure that the fire does not spread. The method of insulation execution should be specified in the technical design prepared for the given building object.

Painting

The elements of SDS smoke control ducts may be, by the manufacturer, painted with polyester powder paints or acrylic paints, maintaining the technological regimes described in O&MM (Operation and Maintenance Manuals).

Dimensions

Single fire zone smoke control ducts with dimensions (width x height) up to 1250 x 1000mm are described by EN 12101-7 standard. Therefore, they are placed on the market on the basis of the declaration of conformity with the CE-1488-CPR-0463/W certificate. Ducts with larger dimensions (width x height) up to 2500 x 1500mm are described in the specification ITB-KOT-2019/0865 edition 2 and therefore are placed on the market on the basis of the declaration of conformity with the National Certificate of Performance No. 020-UWB-2327/W. SDS ducts made according to the above-mentioned reference documents can be used simultaneously and interconnected in one installation.

Tables 1 and 2 show the standard dimensions of the ducts and system components. In the case of conductor elements of rectangular cross-section, the length of straight sections and fittings is a maximum of 1500mm, and in the case of round sections up to 1000mm. Intermediate sizes are possible.

Table 1: standard transverse dimensions for rectangular conductor elements.

Conductor height H [mm]	Conductor width B [mm]															
	100	150	200	250	300	400	500	600	800	1000	1250	1500	1750	2000	2250	2500
	Cross-sectional area [m²]															
100	0,01	0,015	0,02	0,025	0,03	0,04	0,05	0,06	0,08	0,10	0,125					
150	0,015	0,0225	0,03	0,0375	0,045	0,06	0,075	0,09	0,12	0,15	0,1875					
200	0,02	0,03	0,04	0,05	0,06	0,08	0,10	0,12	0,16	0,20	0,25	0,20	0,35	0,40	0,45	0,50
250	0,025	0,0375	0,05	0,0625	0,075	0,10	0,125	0,15	0,20	0,25	0,3125	0,375	0,437	0,50	0,562	0,625
300	0,03	0,045	0,06	0,075	0,09	0,09	0,15	0,18	0,24	0,30	0,375	0,45	0,525	0,60	0,675	0,75
400	0,04	0,06	0,08	0,10	0,12	0,16	0,20	0,24	0,32	0,40	0,50	0,60	0,70	0,80	0,90	1,00
500	0,05	0,075	0,10	0,125	0,15	0,20	0,25	0,30	0,40	0,50	0,625	0,75	0,875	1,00	1,125	1,25
600	0,06	0,09	0,12	0,15	0,18	0,24	0,30	0,36	0,48	0,60	0,75	0,90	1,05	1,20	1,35	1,50
800	0,08	0,12	0,16	0,20	0,24	0,32	0,40	0,48	0,64	0,80	1,00	1,20	1,40	1,60	1,80	2,00
1000	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,80	1,00	1,25	1,50	1,75	2,00	2,25	2,50
1250			0,25	0,312	0,375	0,50	0,625	0,75	1,00	1,25	1,562	1,875	2,187	2,50	2,812	3,125
1500			0,30	0,375	0,45	0,60	0,75	0,90	1,20	1,50	1,875	2,25	2,625	3,00	3,375	3,75

Scope covered by EN 12101-7 Scope covered by ITB-KOT-2019/0865 edition 2

It is permissible to manufacture cables with other cross-sectional dimensions within the ranges limited in Table 1.

Table 2: Standard diameters of circular conductor elements.

Element diameter [mm]						
630	710	800	900	1000	1120	1250
Cross-sectional area [m2]						
0,312	0,396	0,503	0,636	0,785	0,985	1,227

Other diameters are permissible provided that 630mm ≤ D ≤ 1250mm.

Dimensioning and marking rules for conductor elements

Table 3: Components of the SDS product set - examples.

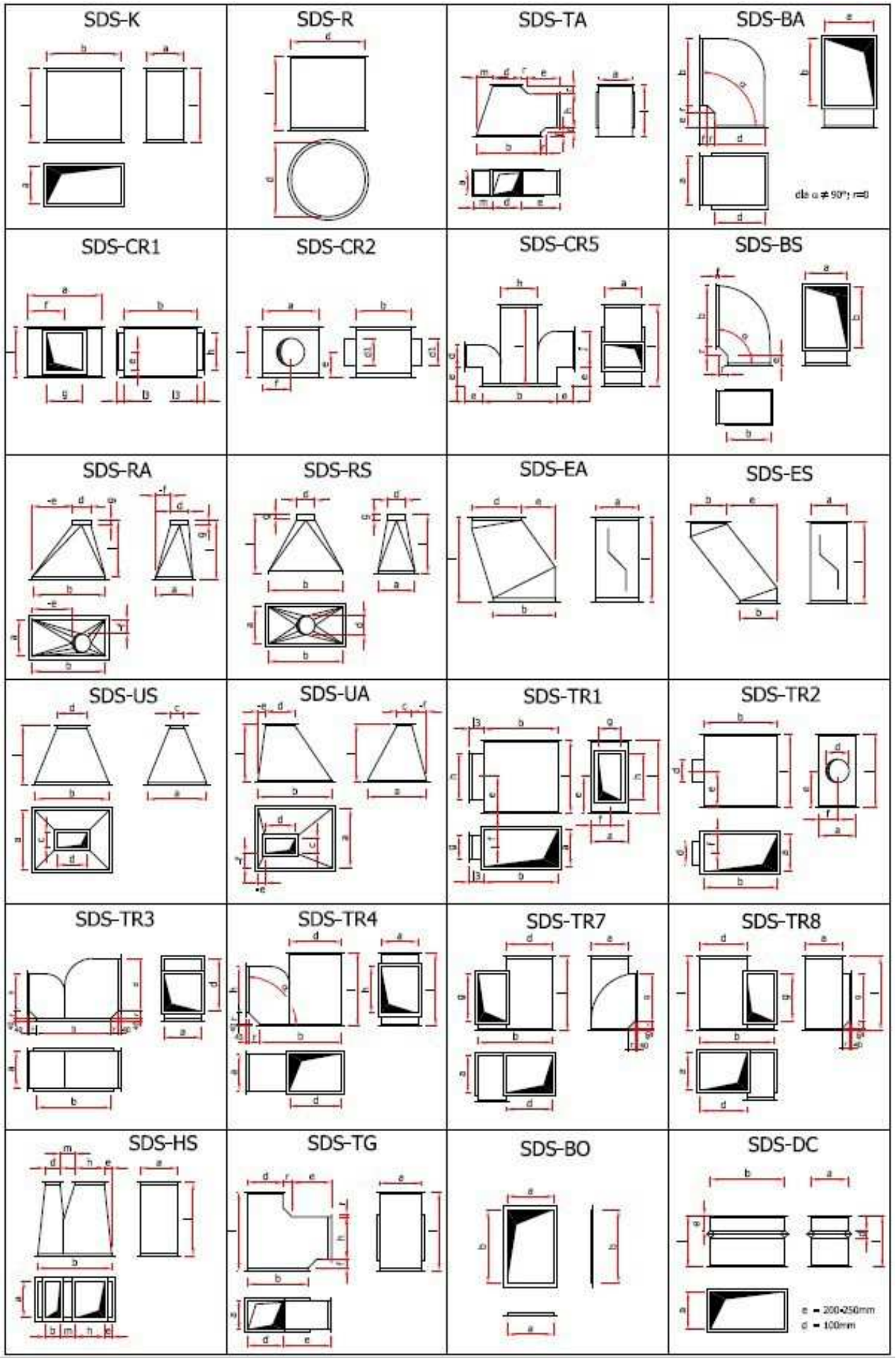


Table 4: Components of the SDS product set.

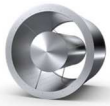
Rectangular compensator	Compensation duct	Circular compensator	Exhaust grille	Exhaust grille	Control damper
SDS-KE	SDS-DC	KA	SDS-STW	SDS-STS1	SDS-PWO
					
Control damper for grilles	**Control damper for grilles**	**Rectangular acoustic silencer**	**Inspection hatch**	**Circular silencer with core**	**Circular silencer without core**
SDS-GS	SDS-GP	SDS-TAP	SDS-DR	TL-CN	TL-C
					
Ceramic gasket	**Mounting clamp**	**Threaded rods**	**Flexible sealant**		
SDS-UC	SDS-MKZ	SDS-MPG	SDS-FS		
			 SOUDAL, BOLL		

Table 5. Additional components of the SDS product set

Counterflash	Flat flange	Adapter piece	Outlet fitting H	Outlet fitting V	Circular outlet fitting
SDS-PK	SDS-KP	SDS-RSK	SDS-KW-H	SDS-KW-V	SDS-KWO
					

Installation

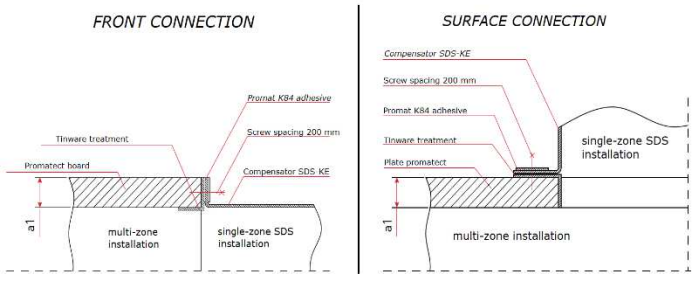
Single fire zone steel smoke control ducts of SDS type should be made in accordance with the technical design prepared individually for a given building, taking into account the requirements of building regulations, in particular the Regulation of the Minister of Infrastructure of 12 April 2002 on technical conditions to be met by buildings and their location (Journal of Laws No. 75, item 69.0, as amended) and the requirements of standard PN-EN 12101-7:2012 or (for large dimensions) ITB KOT-2019/0865 issue 2.

The ducts should be installed by companies trained by Smay LLC. in the technical characteristics of the product, the conditions for performing the work, and the inspection of the work carried out.

Information on installed smoke control duct SDS should be placed on the conduit, or written in the construction log.

Connection to multi-zone installation

A single fire zone smoke control system made of SDS products can be combined with a multi-zone system. The method of connecting SDS cables with multi-zone installation should be specified in the technical design prepared for a given building.



Drawing 2. Example connection between SDS ducts and multi fire zones smoke control ducts..

Compensatory elements:

The purpose of the use of expansion joints is to counteract linear expansion of the smoke control ducts to which they are subjected as a result of heating during a fire. The consequence of lack of expansion joints may be destruction of the system, making effective smoke removal impossible. They should be used for ducts longer than 5m. The maximum permissible distance between compensating elements must not exceed 10m. The use of other compensating elements is not allowed.

Compensators SDS-KE

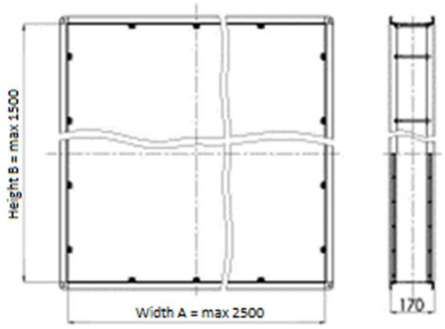


Figure 3. Dimensioning rules for SDS-KE expansion joints

SDS-KE expansion joints are made of temperature-resistant plastic. Connection flanges are made of galvanized steel profiles 30 or 40 mm wide (30 mm wide profiles are used when both the width and height of a duct/ fitting do not exceed 1250 mm). The free length of the SDS-KE compensators is 170 mm.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-KE - <A> x <B>

Where:

SDS-KE	Compensator
A, B	Characteristic dimensions in mm

Order example: **SDS-KE-1000x250**

Compensation channel SDS-DC

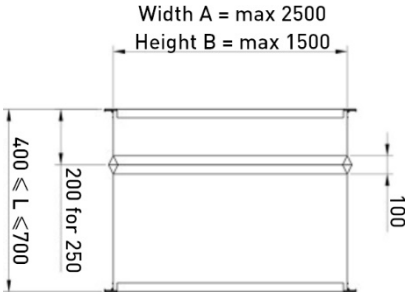


Figure 4. Dimensioning rules for SDS-DC compensation channels

The expansion ducts are made of galvanized sheet steel DX51+Z275 according to EN 10346:2011P standard. Main dimensions correspond to the SDS-K duct series. The overall length is between 400 and 700 mm. The compensation function is realized by the deformation performed on the channel jacket. SDS- DC expansion channels, similarly to SDS-K channels, are finished with 30 or 40 mm wide profile frames (30 mm wide profiles are used when both the width and height of the duct/ fitting do not exceed 1250 mm).

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-DC - <a> x <b> - <l>

Where:

SDS-DC	Compensation channel
a, b, l,	Characteristic dimensions in mm

Order example: **SDS-DC-1000x250-500**

KA expansion joints

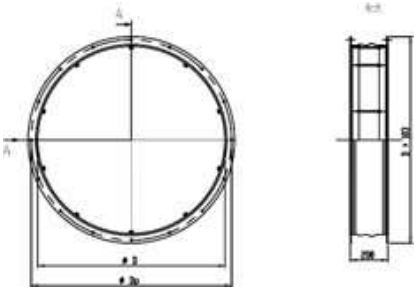


Figure 5. Dimensioning rules for KA flexible spigots

KA expansion joints are made of temperature-resistant plastic. Connection flanges are made of galvanized steel profiles. The length of KA expansion joints in free state is 200 mm.

They are manufactured in the diameter range 630-1250 mm.

Ordering procedure:

When ordering, please provide information according to the following method:

KA - <D> - <L>

Where:

KA	Compensator
D,L	Characteristic dimensions in mm

Order example: **KA-1000x250-500**

Exhaust elements

Exhaust elements are ventilation grilles, which are intended for use in smoke control systems. SDS-STW and SDS-STS1 grilles have maximum dimensions of 1250x1000 mm for SDS ducts covered by PN-EN 12101-7 standard and 2500x1250 mm for SDS ducts covered by National Technical Assessment no. ITB-KOT-2019/0865 edition 2. They can be mounted individually or in batteries on any SDS cable wall. The grilles are made of galvanized steel, and there are no plastic elements in them. SDS-STW and SDS-STS1 grilles can be powder coated with polyester paint in any RAL colour.

SDS-STW Grille

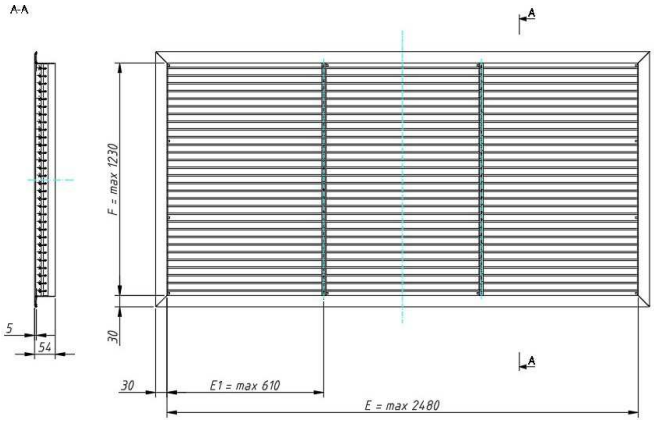


Figure 6. Dimensioning rules for SDS-STW grilles.

SDS-STW grilles are single row grilles made from galvanized steel profiles, with aerial blades in a fixed position perpendicular to the grille plane. Grilles with width above 610 mm have 1 gap, above 1221 mm 2 gaps and above 1831 mm 3 gaps to compensate for thermal elongations. The exhaust function is carried out by the blades in the grille. The clearance is about 76%. The length of the grille is 54mm.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-STW - <C> x <D>

Where:

SDS-STW	Exhaust grille
C, D	Characteristic dimensions in mm

Order example: **SDS-STW-1000x250**

SDS-STS1 Grille

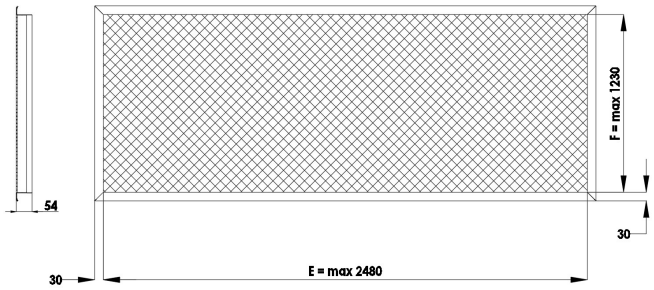


Figure 7. Dimensioning rules of SDS-STS1 flexible spigots.

SDS-STS1 grilles are mesh grilles and their active surface is filled with expanded metal mesh with a thickness of 1. 0mm. The clearance is about 56% . The length of the grille is 54mm.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-STS1 - <C> x <D>

Where:

SDS-STS1	Exhaust grille
C, D	Characteristic dimensions in mm

Order example: **SDS-STS1-1000x250**

Inspection items

Inspection elements are inspection doors.

SDS-DR Inspection doors

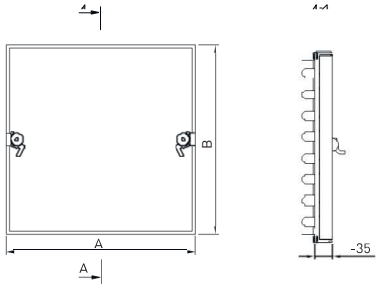


Figure 8. Dimensioning rules of SDS-DR inspection doors.

SDS-DR doors are manufactured in the following dimensions: DR15- 150x150, DR20- 200x200, DR21- 200x125, DR25- 250x250, DR30- 300x300.

Inspection doors are made of galvanized steel sheet. The set includes 25 mm thick insulated covers with locks and a frame suitable for mounting in a duct.

Ordering procedures:

When ordering, please provide information according to the following method:

SDS-DR - <C> x <D>

Where:

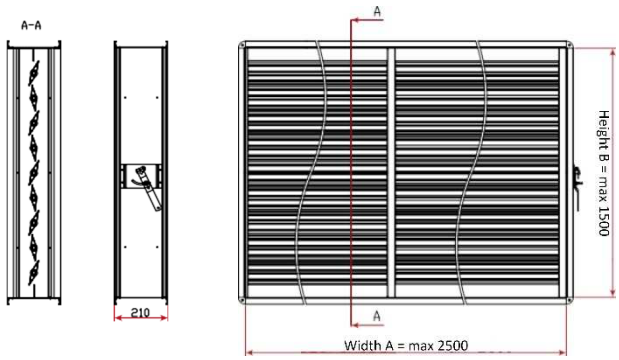
SDS-DR	Inspection doors
C, D	Characteristic dimensions in mm

Order example: **SDS-DR-250x250**

Regulating elements

Intended for use in smoke control systems as elements regulating the flow of air and hot fire gases through ducts from the smoked rooms.

SDS-PWO volume control dampers



Horizontal - width and vertical - height

Figure 9. Dimensioning rules for SDS-PWO dampers.

SDS-PWO dampers are designed to control the flow in SDS installations. They are manufactured in the full range of dimensions of SDS ducts (width up to 2500 mm, height up to 1500 mm). Connection frames are made of galvanized profiles 30 mm wide (when no dimension exceeds 1250 mm) and 40 mm (for larger dimensions). In the corners of the frames there are holes for connection with M10 steel screws. Where the width of the damper is greater than 1250mm the damper has two kinematically coupled fields. Dampers SDS-PWO do not contain any plastic parts.

The degree of adjustment is factory limited to a range of 20-90°.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-PWO - <C> x <D>

Where:

SDS-PWO	Volume control damper
C, D	Characteristic dimensions in mm

Order example: **SDS-PWO-1000x250**

SDS-GS volume control dampers

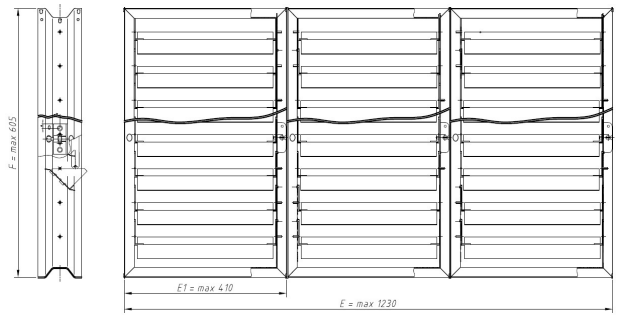


Figure 10. Dimensioning rules for SDS-GS dampers.

SDS-GS dampers are designed for SDS-xxx grilles. They are fixed at the back with self-drilling screws or single rivets. The maximum dimensions of the damper are 2500x1250 mm according to the grille assembly dimensions, where single dampers are used for grilles with dimension C ⩽ 417 mm, and a number of individually adjustable dampers for larger grilles. The dampers can be set in the opening position of 45-90° by means of screw mechanisms, accessible from the external side of the grille.

Ordering procedures:

When ordering, please provide information according to the following method:

SDS-GS - <C> x <D>

Where:

SDS-GS	Volume control damper
C, D	Characteristic dimensions in mm

Order example: **SDS-GS-1000x250**

SDS-GP volume control dampers

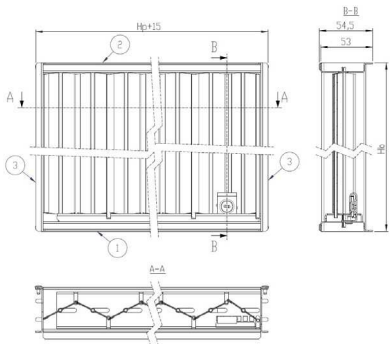


Figure 11. Dimensioning rules for SDS-GP dampers.

Type SDS-GP multileaf dampers are used as an element of air flow control through the grille. In the SDS-GP damper the range of shutter position adjustment is limited to an opening angle of 45-90°. Depending on the dimensions, they are manufactured as single (up to 625x750) or in batteries. Maximum dimension of batteries of SDS-GP butterfly valves is 2500x1250mm.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-GP - <C> x <D>

Where:

SDS-GP	Volume control damper
C, D	Characteristic dimensions in mm

Order example: **SDS-GP-1000x250**

Attenuating elements

Intended for use in smoke control systems as elements suppressing noise caused by the flow of air and hot fire gases through ducts from the smoked rooms.

SDS-TAP and SDS-TAPS rectangular acoustic silencer

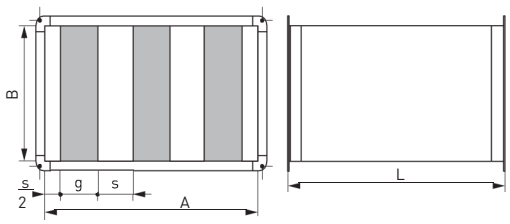


Figure 12. Dimensioning rules for SDS-TAP acoustic silencers.

SDS-TAP silencers are produced in the same range of transverse dimensions as the SDS-K pipes. The maximum length of the silencers is 1500 mm. For logistical reasons, silencers with a weight of more than 360 kg are delivered in 2 or 3 shorter pieces.

Silencer bodies are made of galvanized sheet metal. For determining deviations and tolerances of the main dimensions of enclosures the standard PN-EN 1505:2001 is applied. Silencer bodies are finished with flange frames made of 30 mm wide profile for the cross-sectional dimensions smaller or equal to 1250x1250 and 40 mm for larger dimensions.

The splitter panels are 100 or 200 mm thick and consist of a suitably stiffened frame made of galvanized sheet metal and a filling of mineral wool panels with a density of no less than 40 kg/m³. The side surfaces of the splitter are covered with perforated galvanized sheet metal (40% perforation). In order to reduce the resistance to flow, the splitter may be fitted on one or both sides with curved or straight casings.

Table 6: Acoustic silencer SDS-TAP 11.

A	200		400		600		800		1000		1200		1400		1600	
B	Flow area [m2] / Weight [kg] for 1 mb length															
200	0,02	18,2	0,04	29,1	0,06	40,3	0,08	51,2	0,10	62,1	0,12	74,3	0,14	85,1	0,16	96,0
250	0,025	20,5	0,05	32,7	0,075	44,5	0,10	56,3	0,125	68,4	0,15	81,2	0,175	93,0	0,20	105,1
300	0,03	22,8	0,06	35,9	0,09	48,6	0,12	61,3	0,15	74,4	0,18	88,1	0,21	100,8	0,24	113,9
400	0,04	27,4	0,08	42,3	0,12	56,9	0,16	71,4	0,20	86,4	0,24	101,9	0,28	116,4	0,32	131,3
500	0,05	32,4	0,10	48,8	0,15	65,2	0,20	81,9	0,25	98,3	0,30	115,6	0,35	132,4	0,40	148,8
600	0,06	37,0	0,12	55,2	0,18	73,5	0,24	92,1	0,30	110,3	0,36	129,4	0,42	148,1	0,48	166,3
800	0,08	47,2	0,16	70,1	0,24	93,4	0,32	116,3	0,40	139,2	0,48	163,4	0,56	186,3	0,64	209,2
1000	0,10	56,4	0,20	83,4	0,30	110,0	0,40	136,5	0,50	163,5	0,60	191,0	0,70	217,6	0,80	244,5
1250			0,25	102,4	0,375	135,0	0,50	167,1	0,625	199,3	0,75	231,9	0,875	264,0	1,00	296,2
1500			0,30	118,9	0,45	155,7	0,60	192,4	0,75	229,6	0,90	266,4	1,05	303,1	1,20	340,3

Scope covered by EN 12101-7

Table 7: Acoustic silencer SDS-TAP 15.

A	150		300		450		600		750		900		1050		1200	
B	Flow area [m2] / Weight [kg] for 1 mb length															
200	0,01	16,8	0,02	26,3	0,03	36,2	0,04	45,7	0,05	55,2	0,06	64,7	0,07	75,4	0,08	84,9
250	0,0125	19,1	0,025	29,5	0,0375	40,3	0,01	50,7	0,0625	61,1	0,075	71,6	0,0875	83,3	0,10	93,7
300	0,015	21,4	0,03	32,7	0,045	44,4	0,06	55,8	0,075	67,1	0,09	78,5	0,105	91,1	0,12	102,4
400	0,020	26,0	0,04	39,6	0,06	52,7	0,08	65,9	0,10	79,1	0,12	92,6	0,14	106,7	0,16	119,9
500	0,025	31,0	0,05	46,0	0,075	61,0	0,10	76,0	0,125	91,4	0,15	106,4	0,175	122,3	0,20	137,4
600	0,03	35,6	0,06	52,4	0,09	69,3	0,12	86,1	0,15	103,4	0,18	120,2	0,21	138,0	0,24	154,8
800	0,04	45,8	0,08	67,3	0,12	89,2	0,16	110,8	0,20	132,3	0,24	153,8	0,28	176,6	0,32	198,1
1000	0,05	55,0	0,10	80,6	0,15	105,8	0,20	131,0	0,25	156,2	0,30	181,8	0,35	207,9	0,40	233,1
1250			0,125	99,6	0,188	130,4	0,25	161,6	0,312	192,4	0,375	223,2	0,437	254,0	0,50	285,1
1500			0,15	115,8	0,225	151,5	0,30	186,9	0,375	222,3	0,45	257,7	0,525	293,4	0,45	328,8

Scope covered by EN 12101-7

Table 8: Acoustic silencer SDS-TAP 21.

A	300		600		900		1200		1500		1800	
B	Flow area [m2] / Weight [kg] for 1 mb length											
200	0,02	23,3	0,04	39,7	0,06	55,7	0,08	73,0	0,10	89,1	0,12	106,4
250	0,025	25,9	0,05	43,6	0,075	60,8	0,10	79,3	0,125	96,6	0,15	115,1
300	0,03	28,5	0,06	47,4	0,09	65,9	0,12	85,7	0,15	104,1	0,18	123,9
400	0,04	34,2	0,08	55,1	0,12	76,4	0,16	98,3	0,20	119,6	0,24	141,5
500	0,05	39,4	0,10	62,8	0,15	86,6	0,20	110,9	0,25	134,7	0,30	159,00
600	0,06	44,6	0,12	70,5	0,18	96,7	0,24	123,5	0,30	149,8	0,36	176,6
800	0,08	56,7	0,16	89,4	0,24	121,7	0,32	155,4	0,40	187,8	0,48	221,4
1000	0,10	67,5	0,20	104,8	0,30	142,4	0,40	180,7	0,50	218,3	0,60	256,5
1250	0,125	83,1	0,25	128,4	0,375	173,4	0,50	218,8	0,625	263,8	0,75	310,1
1500	0,15	96,1	0,30	147,7	0,45	198,8	0,60	250,4	0,75	301,5	0,90	354,0

Scope covered by EN 12101-7

Table 9: Acoustic silencer SDS-TAP 215.

A	350		700		1050		1400		1750		2100	
B	Flow area [m2] / Weight [kg} for 1 mb length											
200	0,03	24,7	0,06	42,5	0,09	61,2	0,12	78,6	0,15	97,3	0,18	114,7
250	0,038	27,3	0,076	46,3	0,114	66,3	0,152	84,9	0,19	104,8	0,23	123,5
300	0,045	30,3	0,09	50,2	0,135	71,3	0,18	91,2	0,225	112,4	0,27	132,2
400	0,06	35,5	0,12	57,9	0,18	81,5	0,24	103,8	0,30	127,5	0,36	150,2
500	0,075	40,8	0,15	65,6	0,225	91,7	0,30	116,8	0,375	142,5	0,45	167,7
600	0,09	46,0	0,18	73,6	0,27	101,8	0,36	129,5	0,45	157,6	0,54	185,3
800	0,12	58,0	0,24	92,2	0,36	127,2	0,48	160,9	0,60	196,0	0,72	229,7
1000	0,15	68,9	0,30	107,6	0,45	147,5	0,60	186,2	0,75	226,2	0,90	265,2
1250	0,187	84,4	0,375	131,2	0,562	177,6	0,75	224,4	0,94	271,7	1,125	318,4
1500	0,225	97,9	0,45	150,5	0,675	203,4	0,90	255,9	1,125	309,8	1,35	362,3

Scope covered by EN 12101-7

Table 10: SDS-TAP acoustic silencer

A	400		800		1200		1600		2000	
B	Flow area [m2] / Weight [kg} for 1 mb length									
200	0,04	26,1	0,08	45,2	0,12	65,3	0,16	84,1	0,20	104,2
250	0,05	29,1	0,10	49,1	0,15	70,4	0,20	90,8	0,25	111,7
300	0,06	31,7	0,12	52,9	0,18	75,5	0,24	97,1	0,30	119,3
400	0,08	36,9	0,16	60,6	0,24	85,7	0,32	109,7	0,40	134,4
500	0,10	42,2	0,20	68,7	0,30	95,8	0,40	122,4	0,50	149,8
600	0,12	47,4	0,24	76,4	0,36	106,0	0,48	135,0	0,60	164,9
800	0,16	59,4	0,32	94,9	0,48	131,3	0,64	166,5	0,80	202,9
1000	0,20	70,3	0,40	110,3	0,60	151,7	0,80	192,1	1,00	233,1
1250	0,25	85,8	0,50	134,0	0,75	182,1	1,00	229,9	1,25	279,0
1500	0,30	99,3	0,60	153,2	0,90	207,5	1,20	261,8	1,50	316,7

Scope covered by EN 12101-7

Selection of parameters for SDS-TAP/TAPS attenuators - dB attenuation values in frequency bands

Table 11.

L [m]	SDS-TAP 11							
	Frequency bands [Hz]							
	63	125	250	500	1000	2000	4000	8000
500	3	4	5	8	12	15	11	8
1000	4	8	10	13	21	21	15	10
1500	5	10	15	19	29	29	19	13

Table 12.

L [m]	SDS-TAP 15							
	Frequency bands [Hz]							
	63	125	250	500	1000	2000	4000	8000
500	3	10	10	12	19	24	21	16
1000	5	11	18	21	29	34	28	22
1500	7	15	27	28	37	42	35	29

Table 13.

L [m]	SDS-TAP 21							
	Frequency bands [Hz]							
	63	125	250	500	1000	2000	4000	8000
500	2	5	12	13	15	12	10	8
1000	5	9	22	21	27	21	13	10
1500	6	13	31	30	36	27	17	15

Table 14.

L [m]	SDS-TAP 215							
	Frequency bands [Hz]							
	63	125	250	500	1000	2000	4000	8000
500	2	3	8	10	11	8	7	5
1000	3	6	16	16	16	13	9	8
1500	4	10	22	22	21	17	11	8

Table 15.

L [m]	SDS-TAP 22							
	Frequency bands [Hz]							
	63	125	250	500	1000	2000	4000	8000
500	1	3	7	7	7	6	5	3
1000	1	7	12	12	12	9	8	6
1500	3	10	18	17	15	12	9	7

In the case of non-standard TAPS silencers, due to unlimited dimensional possibilities, acoustic and flow parameters are given on individual request.

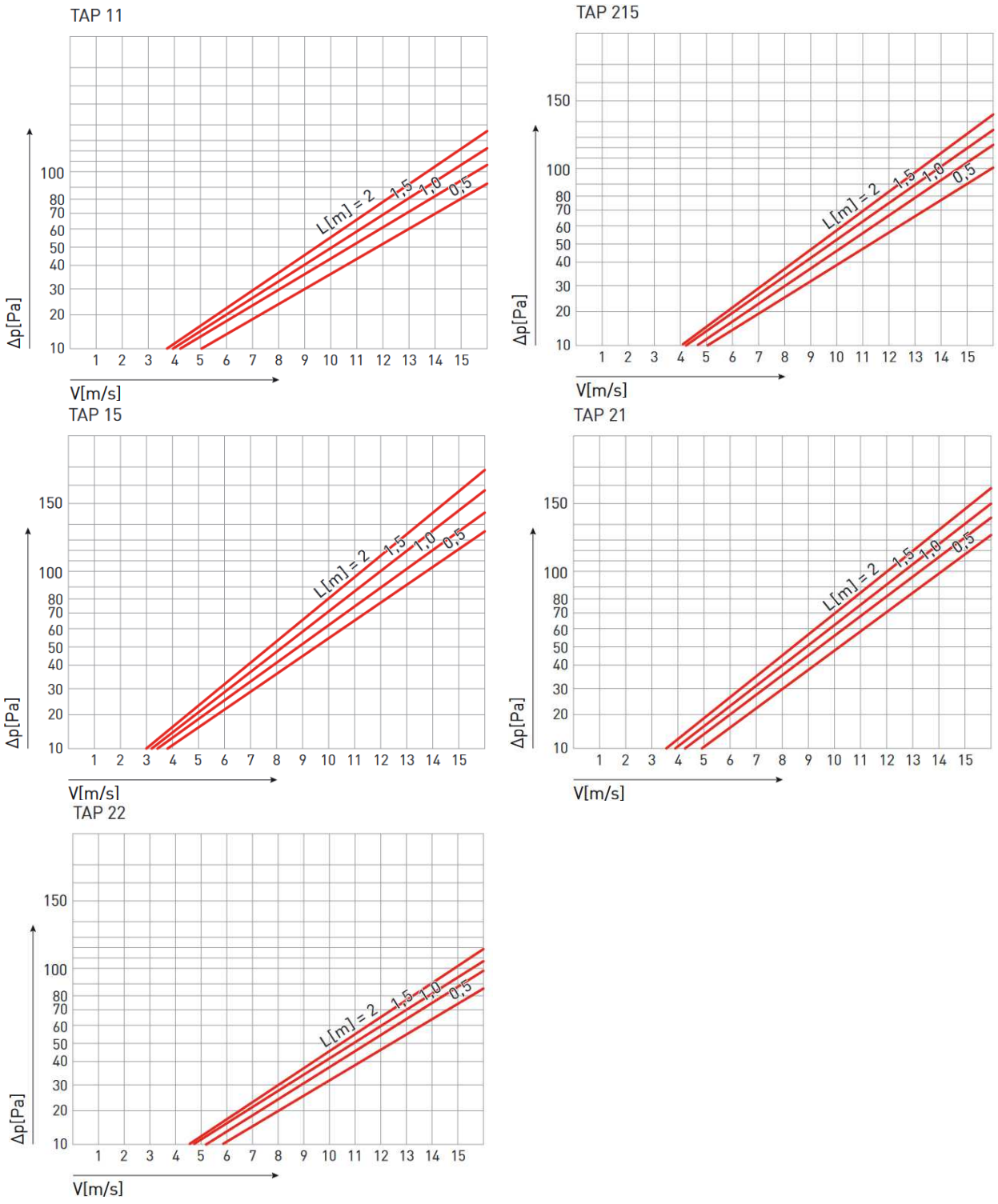
Selection of parameters for SDS-TAP/TAPS dampers

Table 16. Natural noise of silencers LwA [dB(A)].

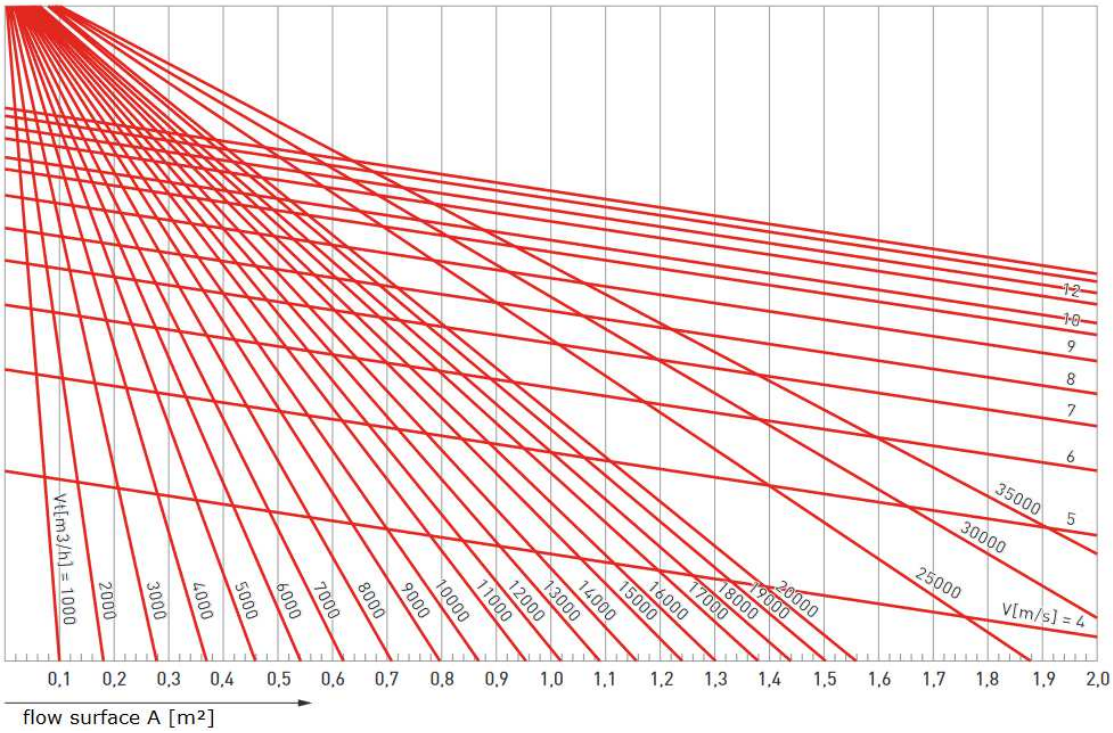
V [m/s]	Flow area [m²]							
	0,2	04,4	0,6	0,8	1,0	1,2	1,4	1,6
5,0	26	29	30	32	33	34	34	35
8,0	34	36	38	39	40	41	42	43
10,0	39	42	44	45	46	47	48	49
12,0	44	46	48	50	52	53	54	55

Selection of parameters for SDS-TAP/TAPS silencers - Pressure losses as a function of flow velocity and silencer length

Nomogram I



Nomogram II.



Ordering procedure:

When ordering, please provide information according to the following method:

SDS - TAP - <X> - <TK> - <A> - x - <B> - x - <L>

SDS - TAPS - <TK> - <A> - x - <B> - x - <L> - (<GR> x <SZ>) x <IK>

Where:

SDS	Smoke Control Ducts System	
TAP, TAPS	row of silencer	
X	Type of silencer	
	11	- 100 mm splitter thickness, distance between splitters 100 mm
	15	- 100 mm splitter thickness, distance between splitters 50 mm
	21	- splitter thickness 200 mm, distance between splitters 100 mm
	215	- splitter thickness 200 mm, distance between splitters 150 mm
	22	- splitter thickness 200 mm, distance between splitters 200 mm
TK	splitters type	
	lack	- without fairings
	H	- with curved fairings on one side
	HH	- with curved fairings on both sides
	K	- with straight fairings on one side
	KK	- with straight fairings on both sides
A	width of the silencer lumen in mm	
B	height of the silencer beam in mm	
L	silencer length in mm	
GR	splitter thickness in mm	
SZ	distance between splitters in mm	
IK	number of splitters	

Order example: **SDS-TAP22-H-1200x1000x1000**
SDS-TAPS-1150x1000x1000 - (200+87)x4

Round acoustic silencer without TL-C core and with TL-CN core

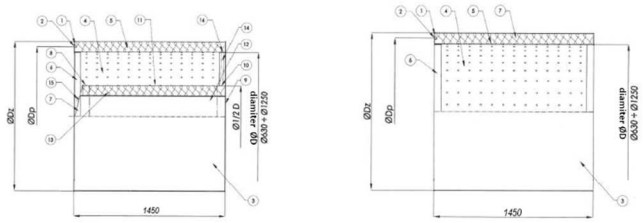
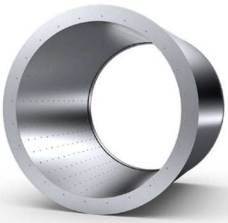


Figure 13. Dimensioning rules for TL-CN and TL-C acoustic silencers.



TL-CN duct silencers with silencer core are produced in a diameter range from Ø630 to Ø1250. The maximum length of the silencer is 1450 mm. TL-CN attenuators have a body made of galvanized steel sheet. The internal body cover is made of perforated galvanized steel sheet. The body of the silencer is terminated with lids made of galvanized steel sheet, in which rivet nuts for screw connections are mounted. The silencer core is made of perforated galvanized steel sheet, terminated with lids (flat and conical) in galvanized sheet. TL-C duct silencers without core have the same size range and construction as TL-CN silencers, with the only difference that they do not have an attenuating core. The silencers are filled with mineral rock wool with a density of at least 40 kg/m³.

Table 17. Dimensions, weight of TL-CN and TL-C silencers.

D [mm]	Dp [mm]	Dz [mm]	nxM	TL-CN			TL-C		
				Approximate weight [kg]					
				L=500 [mm]	L=1000 [mm]	L=1450 [mm]	L=500 [mm]	L=1000 [mm]	L=1450 [mm]
630	690	830	12 x M10	33	56	79	26	44	62
710	770	910	16 x M10	38	63	88	28	48	68
800	860	1000	16 x M10	42	71	99	31	53	75
900	970	1100	16 x M12	48	79	111	35	59	84
1000	1070	1200	16 x M12	52	88	123	38	65	92
1120	1190	1320	16 x M12	59	98	138	42	72	102
1250	1320	1450	20 x M12	66	110	154	47	80	113

Table 18. Selection of TL-CN attenuator parameters - Pressure losses as a function of flow velocity and attenuator length. Noise self

Diameter	V [m/s]	Silencer length [mm]					LWA [dB(A)]
		500	750	1000	1250	1450	
630	5	17	19	20	22	23	44
	7	32	35	38	41	44	50
	10	69	75	81	87	93	59
	12	98	106	115	124	132	64
710	5	17	19	20	21	23	44
	7	33	35	38	41	43	51
	10	65	71	76	81	87	59
	12	95	103	111	119	127	64
	15	115	124	133	143	152	68
800	5	18	19	20	21	22	44
	7	33	35	37	39	41	51
	10	66	71	75	80	84	60
	12	95	102	108	114	121	64
	15	114	122	130	137	145	68
900	5	16	17	18	19	20	44
	7	31	33	35	37	39	51
	10	64	68	72	76	80	60
	12	95	101	107	113	119	65
	15	114	121	128	135	143	68

Diameter	V [m/s]	Silencer length [mm]					LWA [dB(A)]
		500	750	1000	1250	1450	
1000	5	16	17	18	19	20	44
	7	31	33	35	37	39	51
	10	64	68	72	76	80	61
	12	93	98	104	110	115	65
1120	5	15	17	18	19	21	45
	7	29	31	34	37	39	51
	10	61	67	72	77	83	61
	12	87	94	102	110	117	65
	15	104	113	122	132	141	68
1250	5	14	16	17	18	20	45
	7	29	31	34	37	39	51
	10	60	65	70	75	81	62
	12	87	94	102	110	117	65
	15	104	113	122	132	141	68

The pressure losses and self-noise of TL-C attenuators are acceptably close to the characteristic values of straight circular ducts.

Table 19. Selection of parameters of TL-CN attenuators - attenuation values in dB in frequency bands.

TL-CN									
D [mm]	L	Frequency bands [Hz]							
		63	125	250	500	1000	2000	4000	8000
630	500	1	3	6	12	15	13	11	8
	750	2	4	9	17	24	21	15	11
	1000	2	5	11	22	33	29	19	13
	1250	3	7	13	25	41	36	23	15
	1450	4	8	14	28	49	43	26	16
710	500	1	3	5	11	13	13	10	8
	750	2	4	8	16	23	20	14	10
	1000	2	5	10	21	33	27	17	12
	1250	3	6	12	25	41	34	20	13
	1450	4	7	14	28	48	40	23	14
800	500	1	2	5	11	12	11	7	7
	750	2	4	8	15	17	18	11	9
	1000	2	5	10	19	22	24	14	10
	1250	3	6	12	23	35	31	17	11
	1450	3	6	13	26	47	37	20	12
900	500	1	2	5	11	12	10	6	6
	750	2	3	7	15	22	16	10	8
	1000	2	4	9	18	31	22	13	9
	1250	3	5	11	21	38	28	16	10
	1450	3	6	12	23	45	34	18	11
1000	500	1	2	5	10	12	10	6	5
	750	2	3	7	14	21	16	9	7
	1000	2	4	9	18	30	21	12	8
	1250	3	5	11	21	37	27	14	9
	1450	3	6	12	23	44	32	16	10
1120	500	1	2	5	10	11	9	5	4
	750	2	3	7	14	20	15	9	6
	1000	2	4	9	17	28	21	12	7
	1250	3	5	10	20	36	26	13	8
	1450	3	6	11	22	44	30	14	9
1250	500	1	2	5	9	11	9	5	4
	750	2	3	7	13	19	15	8	6
	1000	2	4	8	17	26	20	11	7
	1250	3	5	9	19	35	24	12	8
	1450	3	5	10	21	43	28	12	8

TL-C									
D [mm]	L	Frequency bands [Hz]							
		63	125	250	500	1000	2000	4000	8000
630	500		1	4	12	12	8	3	3
	750	1	3	7	16	17	9	4	4
	1000	1	4	9	20	21	9	5	4
	1250	2	5	10	24	26	11	6	5
	1450	2	5	11	28	30	12	6	5
710	500		1	4	10	9	6	3	3
	750		2	7	13	14	8	4	4
	1000	1	3	9	17	18	9	5	4
	1250	2	4	10	22	23	11	6	5
	1450	2	5	11	27	28	12	6	5
800	500		1	4	10	8	5	3	2
	750		2	6	12	11	6	4	3
	1000	1	3	8	14	15	8	5	4
	1250	2	3	9	20	21	9	5	4
	1450	2	4	11	26	27	10	6	5
900	500		1	3	10	7	4	3	2
	750		2	5	12	11	5	3	2
	1000	1	3	8	14	15	6	4	3
	1250	1	3	9	19	20	7	4	3
	1450	2	4	10	24	25	8	5	4
1000	500		1	3	8	6	3	2	2
	750		2	5	10	9	3	3	2
	1000	1	3	8	12	13	4	4	3
	1250	1	3	9	17	18	5	4	3
	1450	2	4	10	22	24	6	5	4
1120	500		1	3	7	6	3	2	2
	750		1	5	9	9	3	3	2
	1000		2	7	12	13	4	4	3
	1250	1	2	9	16	17	5	4	3
	1450	1	3	10	20	22	6	5	4
1250	500		1	2	7	6	3	2	2
	750		1	4	9	9	3	3	2
	1000		2	7	11	12	4	4	3
	1250	1	2	8	14	16	4	4	3
	1450	1	3	10	18	20	5	5	4

Ordering procedure:

When ordering, please provide information according to the following method:

TL - <X> - <Dn> - <L>

Where:

TL	Circular acoustic silencer
X	type of silencer
	CN - with core
	C - coreless
Dn	nominal diameter in mm
L	silencer length in mm

Order example: **TL-CN-1000x1000**

Mounting elements

Designed for use in smoke control systems as connecting elements for individual system components and their suspensions.

Mounting clamp SDS-MKZ

The clamps are used for additional clamping of SDS ventilation, air-conditioning and smoke exhaust duct connections and fittings made of flange flanges. The clamps are made of steel and coated with zinc as standard. In SDS installations it is allowed to use clamps made of galvanized steel. Their spacing should not exceed 250 mm.

Ordering procedure:

When ordering, please provide information according to the following method:

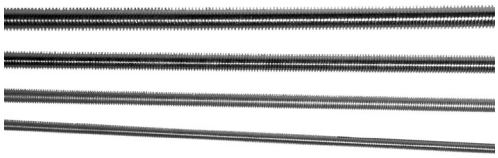
SDS-MKZ - <I>

Where:

SDS-MKZ	mounting clamp
I	Quantity pcs.

Order example: **SDS-MKZ-10**

Threaded rods SDS-MPG



Threaded rods together with nuts and connectors are used for suspension of SDS ventilation, air conditioning and smoke extraction systems. For SDS installations, the selection of the diameters of the rods used must be made on the basis of the installation recommendations in the "Guidelines for the selection of suspension elements" (version IX 2015).

Assortment available:

Thread size:	M10	M10	M12	M12	M16	M16	M20	M20
Length in [mm]	1000	2000	1000	2000	1000	2000	1000	2000

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-MPG - <T> x <S> - <K>

Where:

SDS-MPG	Smoke Control Ducts System
T	Thread size in mm
S	Length in mm
K	Strength class

Order example: **SDS-MPG-10x2000-3,6**

Sealing elements

The purpose of using sealing elements is to ensure the tightness of the connections of individual pipes and components of the entire SDS product set. Among these elements we can distinguish: ceramic gasket and flexible (silicone) gasket.

Ceramic gasket SDS-UC

For flanged connections, steel elements of SDS installations, ceramic or silicate gaskets resistant to temperatures min 1000°C, with cross-section of at least 20x5 mm should be used (it is acceptable to use two gaskets 10x5mm).
Packing -100 mb.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-UC - <T> x <S>

Where:

SDS-UC	Ceramic gasket
T	Gasket width in mm
S	Gasket thickness in mm

Order example: **SDS-UC-20x5**

Flexible sealant SDS-FS

For sealing all leakage points of SDS installations silicone preparations are used:

- Fire Silicone B1 FR by SOUDAL
- High temperature silicone by BOLL

Fire Silicone B1 FR by SOUDAL is a single-component fireproof flexible silicone sealant with neutral curing for indoor and outdoor use.

Key features of Fire Silicone B1 FR:

- Colour - grey
- Fire resistance EI 240, F4 (4h.), flammabilityclass B1 (DIN 4102)
- Ready for immediate use
- Permanently elastic after curing
- Excellent adhesion to typical building substrates
- Low modulus of elasticity
- Resistant to weather conditions and UV radiation
- Packing: cartridge 310 ml – 15 pcs. Per carton

The product is classified as a hazardous preparation: Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment. The product is not classified as harmful for the environment, but must be handled with extreme caution. The product is not soluble in water. No data on bioaccumulation, biodegradation of the product. Volatile organic content 7%. The product is not hazardous to the ozone layer.

Other technical data, properties and recommendations are given in the Technical Data Sheet of SOUDAL

BOLL high temperature silicone is a one-component temperature resistant silicone mass with a high degree of elasticity. It has very good adhesion to metal sheets, metals, aluminium, glass and plastics.

Key features:

- Colour – red, black,
- Temperature resistance from -40 to + 350°C
- Surface drying time approx. 5 min
- Penetration hardening time 2 mm / 24 h
- Breaking strenght 0,51 MPa
- Shore hardness A 32
- Elongation to break 70%
- Application temperature + 5 to + 40°C

All technical data are approximate values.

The preparation is classified as hazardous according to the criteria of Regulation 1272/2008. Skin sensitization, may cause an allergic skin reaction.

Other technical data, properties and recommendations are given in the Safety Data Sheet of BOLL Company.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-FS - <N> - <I>

Where:

SDS-FS	Flexible sealant
N	Type: S- Soudal; B- Boll
I	Quantity pcs.

Order example: **SDS-FS-S-10**

Additional elements

The purpose of using additional elements is to connect the ducts of the SDS product set to the fans. These elements include: counter-flange, flat flange and transition flange, H and V outlet flange and round flange.

Counterfoil SDS-PK

Connection flange for installation at the inlet and outlet of axial fans. The arrangement of holes corresponds to the arrangement of holes in the flanges of Smay fans. A different, dedicated arrangement of connecting holes is possible. They are mounted with screws to the fan flange openings. There are 7 sizes available - diameter range 630÷1250 mm.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-PK - <T> x <S>

Where:

SDS-PK	Counterfoil
T	Width in mm
S	Thickness in mm

Order example: **SDS-PK-20x5**

Flat flange SDS-KP

Connection flange for installation at the inlet and outlet of axial fans. The arrangement of holes corresponds to the arrangement of holes in the flanges of Smay fans. A different, dedicated arrangement of connecting holes is possible. They are mounted with screws to the fan flange openings. There are 7 sizes available - diameter range 630÷1250 mm.

Ordering procedure:

When ordering, please provide information according to the following method:

SDS-KP - <T> x <S>

Where:

SDS-KP	Flat flange
T	Width in mm
S	Thickness in mm

Order example: **SDS-KP-20x5**

SDS – single fire zone smoke control ducts

When ordering pipes and fittings, the information must be given according to the following notation:

SDS-K-< a>-<b>-<l>	- rectangular straight duct
SDS-R-<d1>-<l1>	- straight circular duct
SDS-BA-<α>-<a>-<b>-<d>-<e>-<f>-<r>	- asymmetrical rectangular arch
SDS-BS-<α>-<a>-<b>-<e>-<f>-<r>	- symetrical rectangular arch
SDS-UA-<a>-<b>-<c>-<d>-<l>-<e>-<f>	- asymmetrical rectangular-rectangular reducer
SDS-US-<a>-<b>-<c>-<d>-<l>	- symmetric rectangular-rectangular reducer
SDS-RA-<a>-<b>-<d>-<g>-<l>-<e>-<f>	- rectangular-circle asymmetrical reducer
SDS-RS-<a>-<b>-<d>-<g>-<l>	- rectangular-circle reducer symmetric
SDS-EA-<a>-<b>-<d>-<e>-<l>-<r>	- asymmetrical rectangular setoff
SDS-ES-<a>-<b>-<e>-<l>	- symmetrical rectangular setoff
SDS-CR1-<a>-<b>-<g>-<h>-<l>-<e>-<f>-<l3>	- rectangular-rectangular x-piece type R1
SDS-CR2-<a>-<b>-<d1>-<l>-<e>-<f>	- rectangular-circular x-piece type R2
SDS-CR5-<a>-<b>-<d>-<h>-<j>-<e>-<l> >	- rectangular-rectangular x-piece type R5
SDS-TR1-<a>-<b>-<g>-<h>-<l>-<e>-<f>-<l3>	- rectangular-rectangular t-piece type R1
SDS-TR2-<a>-<b>-<d>-<l>-e>-<f>	- rectangular-circle t-piece type R2
SDS-TR3-<a>-<b>-<d>-<h>-<r>	- rectangular-rectangular t-piece type R3
SDS-TR4-<a>-<b>-<d>-<h>-<r>-<l>-<α>	- rectangular-rectangular t-piece type R4
SDS-TR7-<a>-<b>-<d>-<g>-<r>-<l>	- rectangular-rectangular t-piece type R7
SDS-TR8-<a>-<b>-<d>-<g>-<r>-<l>	- rectangular-rectangular t-piece type R8
SDS-TA-<a>-<b>-<d>-<h>-<e>-<f>-<r>-<m>-<l>	- rectangular oblique t-piece
SDS-TG-<a>-<b>-<d>-<h>-<e>-<f>-<r>-<l>	- straight rectangular t-piece
SDS-HS-<a>-<b>-<d>-<h>-<e>-<m>-<l>	- rectangular port t-piece
SDS-BO-<a>-<b>	- rectangular end cap
SDS-DC-<a>-<b>-<l>	- compensating rectangular duct
SDS-XX- <a>-<b><l>...	- other fitting

Where:

a, b, c, d, e, f, g, h, j, l, l3, m, r, α	Characteristic dimensions as indicated in Table 3, [mm]:

Order example: **SDS-ES-1000-250-300-1000**

Ordering Procedure

When ordering additional items, provide information as follows:

SDS-PK-<Dn>-<Dp>-<d>-<io>-<L>	- counterflange
SDS-KP-<Dn>-<Dp>-<d>-<io>	- Flat flange
SDS-RSK-<Dn><A>x<B>-<L>	- Rectangular-circular transition fitting
SDS-KW-<W>-<A>x<B>	- Outlet rectangular fitting
SDS-KWO-<Dn>	- Outlet circular fitting

Where:

Dn	Nominal diameter, [mm]
Dp	Diameter between holes in flange, [mm] *
d	Flange bore diameter, [mm] *
io	Number of holes in flange, [mm] *
L	Length, [mm] *
W	Connection method
	V - version for vertical mounting
	H - version for horizontal mounting
A	Channel lumen width, [mm].
B	Channel lumen height, [mm].

* optional values - if they are missing, the default values will apply

Order example: **SDS-RSK-1000-600x400**

Ordering procedure

When ordering components, please provide information according to the following notation:

SDS-KE-<A>x<B>	- rectangular compensator
KA-<Dn>	- round compensator
SDS-STW-<C>x<D>	- ventilation grille with blades
SDS-STS1-<C>x<D>	- mesh-type ventilation grille
SDS-PWO-<A>x<B>-W<W>-T2>	- multileaf duct damper
SDS-GS-<C>x<D>	- coarse duct damper
SDS-GP-<C>x<D>	- opposed blade damper
SDS-TAP-<X>-<TK>-<A>x<B>x<L>	- standard rectangular damper
SDS-TAPS-<TK>-<A>x<B>x<L>-(<GR>x<SZ>)x<IK>	- non-standard rectangular silencer
SDS-DR-<a>x<b>	- inspection hatch
TL-CN-<Dn>-<L>	- round silencer with core
TL-C-<Dn>-<L>	- round silencer without core
SDS-UC-<T>-<S>	- ceramic gasket
SDS-MKZ-<I>	- clamp
SDS-MPG-<T>-<S><K>	- threaded rods
SDS-FS-<N>-<I>	- flexible sealant

Where:

A	Duct net width, [mm].
B	Duct net height, [mm].
Dn	Nominal diameter, [mm]
C	Mounting hole width, [mm].
D	Mounting hole height, [mm]
W	Number of damper divisions, [-] *
X	Type of silencer
11	- 100mm splitter thickness, distance between splitters 100mm
15	- 100mm splitter thickness, distance between splitters 50mm
21	- 200mm splitter thickness, distance between splitters 100mm
215	- 200mm splitter thickness, distance between splitters 150mm
22	- 200mm splitter thickness, distance between splitters 200mm
TK	Type of silencer fairings
H	- curved inlet fairing
K	- straight fairing on the inlet
HH	- curved fairing on inlet and outlet
KK	- fairing straight on inlet and outlet
L	Length, [mm].

GR	Thickness of the splitter, [mm].
SZ	Distance between the splitters, [mm].
IK	Number of splitters, [-]
a	Cover width, [mm].
b	Cover height, [mm].
T	Seal width, [mm] (only for SDS-UC) *
	20
T	Thread size, [mm] (only for SDS-MPG)
	M8, M10, M12, M16, M20
T	Rail type (only for SDS-MSZ)
	30G, 45G, 30E, 45E
S	Seal thickness, [mm] (only for SDS-UC) *
	5
S	Bar length, [mm] (only for SDS-MPG)
	1000 - 2000
K	Strength class *
N	Type of sealant *
I	Quantity, [-] *

* optional values - if they are missing, the default values will apply

Order example: **SDS-STW-600x400**