Cylindrical Attenuator

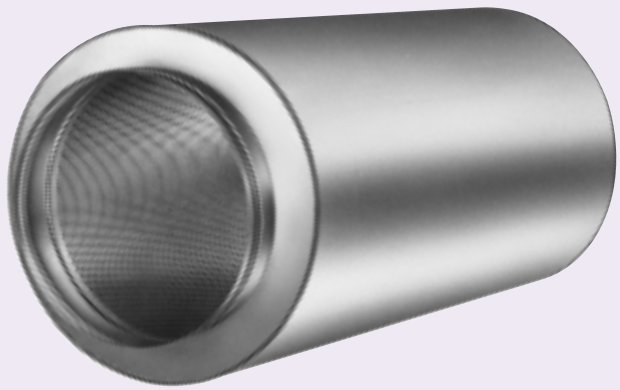
Type C

Solid & Flexible Performance

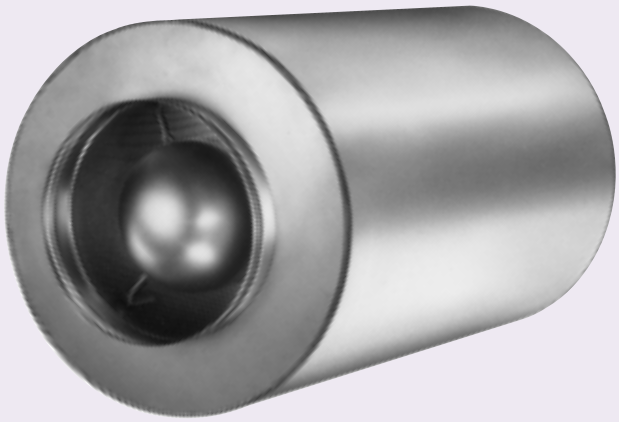
TROX® TECHNIK

Contents · Description CA · CB

Type CA



Type CB



Cylindrical Attenuator Type CA

Type CA cylindrical attenuators are intended for use in ventilation systems.
The outer casing and perforated inner duct are galvanised sheet steel; insulation thickness 50 mm or 100 mm.
The non-combustible acoustic material (DIN 4102 A2) is protected from air flow erosion by glass fibre scrim.
The inlet and outlet connections can either be plug-type spigot, flanged drilled to DIN 24154 or with lip seal (see Order Details).

Cylindrical Attentuator Type CB

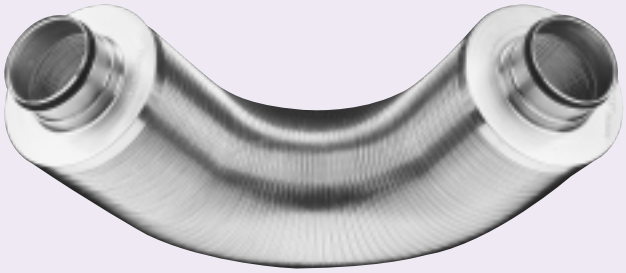
Type CB attenuators are the same as the type CA models, but have an additional Sound-absorbing pod fitted in the centre with a galvanised, perforated sheet covering and coned end to reduce pressure loss.

Special Constructions

Due to the technical co-ordination necessary, special constructions are only available on request.

Description CF · CS

Type CF



Type CS

Flexible Cylindrical Attenuator Type CF

Type CF flexible attenuators are intended for use in ventilation systems. They can be used to attenuate fan noise and reduce sound transmission through ventilation ducting to adjacent rooms (cross talk). A high degree of flexibility means that they can be fitted in complicated duct systems and in restricted spaces.
The outer casing and perforated inner duct are aluminium.
The acoustic material is non-combustible to DIN 4102 A2; Insulation thickness is 25 mm or 50 mm.
The inlet and outlet connections have the following options: plug type spigots, plug type spigots with factory fitted lip seals, socket type spigots or ends with raised edges for a quick locking system.

Solid Cylindrical Attenuator Type CS

Rigid construction of Type CF. Inner duct and outer casing are aluminium.

Special Constructions

Due to the technical co-ordination necessary, special constructions are only available on request.

Construction · Dimensions · Weights CA · CB

Construction

The table below shows weights and the sizes of attenuators available. For details of the required construction variations, see page 11 Order Details.

Nomenclature

$D_{e,oct.}$ in dB: Octave band insertion loss

$f_{m, oct.}$ in Hz: Octave Centre frequency

L in mm: Length

$L_{W, oct.}$ in dB: Sound Power Level of regenerated noise; dB re $W_0 = 10^{-12}$ Watt

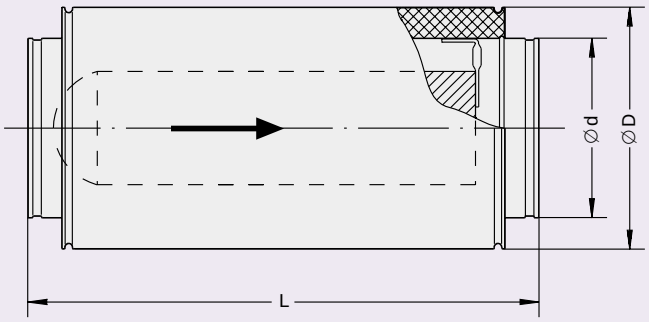
L_W in dB(A): A weighted sound power level of regenerated noise

v_{tot} in m/s: Air velocity in free cross-section

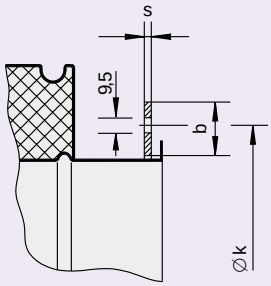
Δp in Pa: Pressure Loss

CA · CB (Type CB shown)

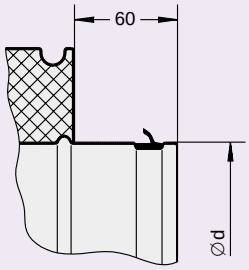
Construction with plug type spigots (standard)



Flange Construction (VF.)



Construction with Lip Seal (VD2) 1)



Insulation thickness 50 mm: ∅ D = ∅ d + 100 mm

Insulation thickness 100 mm: ∅ D = ∅ d + 200 mm

1) Lip seal without any additional on site seals provides low leakage performance to DIN V 24194 Part 2. Class II. Available up to and including size 400

Dimensions

Size	Free area in m²	∅ d in mm	Plain flange to DIN 24154 Part 1: ∅ k in mm	b x s in mm	No. of Holes
100	0,008	99	132	25 x 3	4
125	0,012	124	157	25 x 3	4
160	0,020	159	192	25 x 4	6
200	0,031	199	233	25 x 4	6
250	0,050	249	283	25 x 4	6
315	0,079	314	352	30 x 4	8
400	0,126	399	438	30 x 4	8
450	0,158	448	488	30 x 4	8
500	0,198	498	538	30 x 4	8
560	0,251	558	600	35 x 4	12
630	0,316	628	670	35 x 4	12
710	0,397	708	750	35 x 4	12
800	0,499	798	840	35 x 4	16
900	0,628	898	940	35 x 4	16
1000	0,785	998	1041	35 x 4	16

Weights in kg

Size	CA050/... L in mm			CA100/... L in mm			CB050/... L in mm			CB100/... L in mm		
	500	1000	1500	500	1000	1500	500	1000	1500	500	1000	1500
100	4	7		6	11							
125	5	9		7	13							
160	7	12		9	16							
200	7	13		9	17							
250	9	16	22	11	20	29	10	17	24	12	21	31
315	12	20	28	14	25	35	13	21	30	15	26	37
400	15	25	34	18	30	42	16	27	38	19	32	46
450						46				21	35	50
500						52				22	38	56
560						55				26	44	62
630						62				30	49	69
710						68				33	55	77
800						76				37	61	86
900										40	68	95
1000										45	75	106

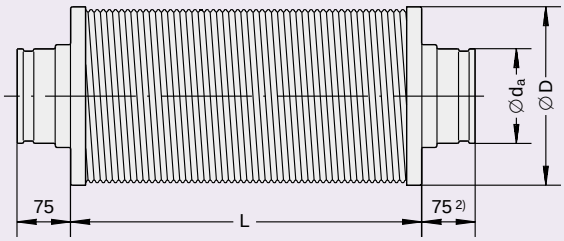
Construction · Dimensions · Weights CF · CS

Construction

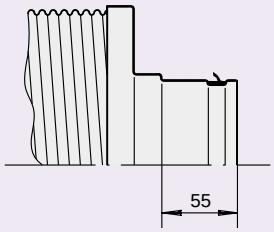
Standard sizes and weights of attenuators are shown in the table below. (Type CS max length: 1500 mm).
For details of the required construction variations, see page 12 Order Details.

CF · CS (Type CF shown)

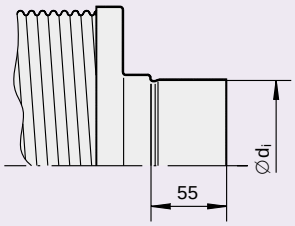
Construction with plug type spigots (standard)



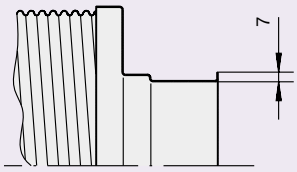
Construction with Lip Seal (VD2) 1)



Construction with socket type spigots (AS2)



Construction with raised edges for quick locking system (BK2)



1) Low leakage to DIN V 24194 Part 2. Class II without additional sealing material.
2) 69 mm for construction with raised edges.

Dimensions

Size	Free area in m^2	∅ d_a in mm	∅ d_i in mm	Insulation thickness 25 mm ∅ D in mm	Insulation thickness 50 mm ∅ D in mm
80	0,005	79	80	135	191
100	0,008	99	100	160	211
125	0,012	124	125	191	235
160	0,020	159	160	221	271
200	0,031	199	200	261	311
250	0,050	249	250	311	366
315	0,079	314	315	376	476
400	0,126	399	400	461	511

Weights in kg

Size	CF025/... L in mm 500	1000	1500	2000	CF050/... L in mm 500	1000	1500	2000	CS025/... L in mm 500	1000	1500	CS050/... L in mm 500	1000	1500
80	0,6	1,0	1,5	1,9	0,9	1,5	2,2	2,8	1,0	1,8	2,6	1,4	2,6	3,7
100	0,8	1,3	1,7	2,2	1,1	1,8	2,5	3,2	1,2	2,1	3,1	1,6	2,9	4,2
125	0,9	1,5	2,1	2,7	1,2	2,0	2,9	3,7	1,4	2,5	3,7	1,9	3,3	4,7
160	1,1	1,8	2,5	3,2	1,4	2,4	3,3	4,3	1,6	2,9	4,2	2,1	3,8	5,4
200	1,3	2,2	3,0	3,9	1,7	2,9	4,0	5,1	2,0	3,6	5,2	2,6	4,6	6,5
250	1,6	2,7	3,7	4,7	2,1	3,5	4,8	6,2	2,5	4,4	6,2	3,1	5,5	7,8
315	1,9	3,2	4,5	5,7	2,4	4,0	5,6	7,2	2,9	5,2	7,5	3,5	6,2	8,9
400	2,5	4,1	5,6	7,2	3,1	5,1	7,1	9,1	3,7	6,6	9,4	4,5	7,9	11,3

Insertion Loss Type CA...

Insertion Loss D_e

From the test conditions described in DIN EN ISO 7235, the duct/reverberation chamber method was chosen. This method involves an empty duct being exposed to a noise, the third octave levels of which are measured in the connecting reverberation chamber under defined conditions. The attenuator to be tested is then inserted in the empty duct and the measurement repeated. The difference between the two measurements is the “insertion loss D_e”.

The octave values are calculated from the third octave measurements. Data measured in Trox Laboratory to DIN EN ISO 7235.

Laboratory measurements exceeding 50 dB are indicated as 50 dB, in line with common practice.

Insertion Loss $D_{e, oct.}$ in dB

Type CA050 (without pod); **Insulation thickness = 50 mm**

Length L = 500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
100	3	5	8	14	23	30	18	13
125	3	4	7	12	21	23	12	10
160	2	3	6	10	18	17	8	8
200	1	2	5	9	16	13	5	6
250	1	2	4	8	14	10	3	4
315	1	1	3	7	12	7	2	3
400	1	1	3	6	11	6	1	2

Lenth L = 1000 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
100	4	9	15	27	42	50	43	25
125	4	7	12	23	38	42	29	20
160	3	5	9	19	34	30	18	15
200	2	4	8	16	31	22	12	11
250	2	3	6	14	28	17	8	9
315	1	2	5	12	25	13	5	6
400	1	2	4	10	22	10	3	5

Lenth L = 1500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	2	4	8	19	39	23	13	12
315	2	3	7	17	35	17	9	9
400	1	2	6	14	31	13	6	7

Type CA100 (without pod); **Insulation thickness = 100 mm**

Length L = 500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
100	4	9	12	18	35	33	26	14
125	4	7	10	17	31	26	19	11
160	3	6	9	15	28	20	13	8
200	3	5	8	15	25	16	9	7
250	2	4	7	14	21	13	6	5
315	2	3	6	13	18	10	4	4
400	1	3	6	12	17	8	3	3

Length L = 1000 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
100	5	17	24	35	50	50	47	25
125	5	14	21	32	48	44	33	20
160	5	11	18	30	42	33	22	15
200	4	9	16	28	38	26	16	12
250	3	8	14	26	33	21	11	9
315	3	6	12	24	29	16	8	7
400	2	5	11	23	25	12	5	5
450	2	5	10	22	23	11	4	5
500	2	4	10	21	22	10	4	4

Length L = 1500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	4	11	21	37	41	27	15	12
315	3	9	18	34	35	21	10	9
400	3	7	16	32	31	16	7	7
450	2	6	15	31	29	14	6	6
500	2	6	14	30	27	13	5	6
560	2	5	13	29	25	11	4	5
630	2	5	12	28	23	10	4	4
710	2	5	11	27	22	9	3	4
800	2	4	11	26	20	8	2	3

Insertion Loss $D_{e, oct.}$ in dB

Typ CB 050 (with pod); **Insulation thickness = 50 mm**

Length L = 500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	1	3	6	11	17	20	23	23
315	1	3	5	10	15	17	18	18
400	1	2	5	8	13	15	14	13

Length L = 1000 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	3	5	9	18	42	48	47	35
315	2	5	8	15	40	42	36	27
400	2	4	6	12	38	35	28	20

Length L = 1500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	5	7	10	23	50	50	50	44
315	5	6	8	19	50	50	50	34
400	5	5	7	15	50	50	39	25

Typ CB 100 (with pod); **Insulation thickness = 100 mm**

Length L = 500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	2	5	10	17	24	23	26	24
315	2	5	9	16	21	20	21	18
400	1	4	8	14	18	17	16	14
450	1	4	7	14	16	16	14	12
500	1	3	7	13	16	15	13	11
560	1	3	6	13	15	14	11	10
630	1	3	6	12	15	13	10	9
710	1	3	6	12	14	12	9	8
800	1	2	5	11	13	11	8	7
900	1	2	5	10	13	10	7	6
1000	1	2	5	10	12	10	6	5

Length L = 1000 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	5	10	17	30	47	50	50	36
315	4	9	15	27	44	45	39	27
400	3	7	13	25	40	38	29	21
450	3	7	12	24	39	35	26	18
500	2	6	12	23	38	33	24	17
560	2	6	11	22	36	31	21	15
630	2	5	11	21	34	29	19	13
710	2	5	10	20	33	27	17	12
800	2	5	9	19	31	25	14	10
900	2	4	9	18	30	23	13	9
1000	2	4	8	17	29	22	12	8

Length L = 1500 mm

Size	$f_{m, oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
250	7	14	22	41	50	50	50	44
315	7	12	20	37	50	50	50	34
400	6	10	17	33	50	50	40	26
450	5	9	16	31	50	50	36	23
500	5	9	16	30	50	50	33	21
560	4	8	15	30	50	48	29	19
630	4	8	14	29	50	44	26	16
710	4	7	13	28	50	41	23	14
800	3	6	13	26	49	37	20	12
900	3	6	12	24	47	34	17	11
1000	3	6	11	23	45	33	16	10

Regenerated Noise · Pressure loss Type CB

Regenerated Noise

The sound power levels stated for regenerated noise in the attenuator were measured in the Trox Laboratory to DIN EN ISO 7235 and evaluated to ISO 5135.
The evaluation allows for the end reflection losses from the connection duct when the sound exits into the reverberation chamber.
The values listed below show the actual regenerated noise in duct to calculate the sound power level radiating into the space, the end reflection from the duct connecting to the space or the end reflection from the grille or diffuser must be subtracted from the listed values.

Pressure Loss

The pressure losses stated were calculated in the Trox laboratory by measuring the difference in pressure between entering and exiting the attenuator, with the unit installed in smooth straight ducting.
The values apply to an attenuator length of 1000 mm.
See table below for correction factors for other lengths.

Pressure Loss-Correction factor for length ≠ 1000 mm

Length in mm	Size					
	250	315	400	450	500	560
500	0,72	0,76	0,80	0,82	0,82	0,83
1500	1,28	1,24	1,20	1,18	1,18	1,17

Regenerated noise · pressure loss in duct

Size 250

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
192	690	4	19	48	36	27	19	<15	<15	<15	<15	26
240	862	5	30	52	42	34	26	20	<15	<15	<15	32
287	1035	6	43	56	47	39	32	25	19	<15	<15	37
335	1207	7	59	58	51	44	37	30	25	18	<15	41
383	1380	8	77	60	54	48	41	35	29	23	16	44
431	1552	9	97	61	56	51	45	39	33	27	20	48
479	1725	10	120	62	58	54	48	42	36	30	23	50
527	1897	11	146	64	60	56	51	46	39	33	27	53
575	2070	12	173	65	62	58	54	49	42	36	30	56

Size 315

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
306	1101	4	16	48	36	28	21	15	<15	<15	<15	26
382	1376	5	25	52	42	34	28	21	15	<15	<15	32
459	1651	6	35	55	47	40	33	27	21	<15	<15	37
535	1927	7	48	58	51	44	38	32	26	20	<15	41
612	2202	8	63	60	54	48	42	36	31	25	17	45
688	2477	9	79	61	57	52	46	40	35	28	21	48
765	2752	10	98	62	59	54	50	44	38	32	25	51
841	3028	11	119	64	61	57	53	47	41	35	28	54
917	3303	12	141	65	62	59	56	50	44	38	31	57

Size 400

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
495	1783	4	13	48	36	28	22	16	<15	<15	<15	27
619	2228	5	21	52	42	35	29	23	17	<15	<15	33
743	2674	6	30	55	47	41	35	28	23	16	<15	38
867	3119	7	41	57	51	45	39	33	28	21	<15	42
990	3565	8	54	59	54	49	44	38	32	26	19	46
1114	4011	9	68	61	57	52	47	42	36	30	23	49
1238	4456	10	84	62	59	55	51	45	39	33	26	52
1362	4902	11	101	63	61	57	54	49	42	36	30	55
1485	5348	12	121	64	62	60	57	52	45	39	33	58

Size 450

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
628	2260	4	13	48	36	29	22	17	<15	<15	<15	27
785	2825	5	20	52	42	36	30	24	18	<15	<15	33
942	3390	6	29	55	47	41	35	29	23	17	<15	38
1099	3955	7	39	57	51	46	40	34	29	22	15	43
1255	4520	8	51	59	54	50	44	39	33	27	20	47
1412	5085	9	64	61	57	53	48	43	37	31	24	50
1569	5649	10	79	62	59	56	52	46	40	34	27	53
1726	6214	11	96	63	61	58	55	50	43	37	31	56
1883	6779	12	114	64	63	60	58	53	46	40	33	59

Size 500

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
776	2794	4	12	48	37	30	24	18	<15	<15	<15	28
970	3492	5	19	52	43	37	31	25	19	<15	<15	34
1164	4190	6	28	56	48	42	37	31	25	18	<15	39
1358	4889	7	38	58	52	47	41	36	30	24	<15	44
1552	5587	8	49	60	55	51	46	40	35	28	21	48
1746	6286	9	62	61	57	54	49	44	38	32	25	51
1940	6984	10	77	63	60	57	53	48	42	36	29	54
2134	7682	11	93	64	61	59	56	51	45	39	32	57
2328	8381	12	110	65	63	61	59	54	47	42	35	60

Size 560

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
975	3509	4	12	48	37	31	25	19	<15	<15	<15	29
1218	4386	5	19	53	44	38	32	26	20	<15	<15	35
1462	5263	6	27	56	49	43	38	32	26	19	<15	40
1706	6140	7	36	58	53	48	43	37	31	25	18	45
1949	7018	8	47	60	56	52	47	41	36	30	22	49
2193	7895	9	60	62	58	55	51	45	40	33	26	52
2437	8772	10	74	63	60	58	54	49	43	37	30	55
2680	9649	11	90	64	62	60	57	52	46	40	33	58
2924	10527	12	107	65	64	62	60	55	49	43	36	61

Example

Given: TVR size 315 in supply air
‡ = 1530 m³/h
Total pressure differential: 250 Pa
Specified Sound pressure level in room 45 dB(A)

$f_{m, oct.}$	63	125	250	500	1k	2k	4k	8k
TVR size 315 *) ISO 5135-1984	60	61	57	55	55	51	47	48
End reflection attenuation	12	7	3	1	0	0	0	0
TVR size 315 ISO 5135-1997	72	68	60	56	55	51	47	48
CA050 / L = 1500 mm	2	3	7	17	35	17	9	9
Regenerated noise CA050 to VDI 2081	70 27	65 25	53 23	39 18	20 13	34 7	38	39
Regenerated noise CA050 + TVR	70	65	53	39	21	34	38	39
End reflection attenuation size 315	12	7	3	1	0	0	0	0
Room attenuation	5	5	5	5	5	5	5	5
Room level $L_{p, oct.}$ in dB	53	53	45	33	16	29	33	34
Room level L_p in dB(A)	42	→					Requirement met	

*) Data from leaflet 5/3/EN/3 Table 6

Pressure Loss Correction factor for length ≠ 1000 mm

Length in mm	Size				
	630	710	800	900	1000
500	0,85	0,86	0,88	0,89	0,89
1500	1,15	1,14	1,12	1,11	1,11

Regenerated noise · Pressure loss in duct

Size 630

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
1235	4446	4	12	49	38	32	26	20	<15	<15	<15	29
1544	5558	5	18	53	44	38	33	27	21	<15	<15	36
1853	6669	6	26	56	49	44	39	33	27	20	<15	41
2161	7781	7	35	58	53	48	43	38	32	26	18	46
2470	8892	8	46	60	56	52	48	42	37	31	23	49
2779	10004	9	58	62	59	56	51	46	41	34	27	53
3088	11115	10	72	63	61	58	55	50	44	38	31	56
3396	12227	11	87	64	63	61	58	53	47	41	34	59
3705	13339	12	104	65	64	63	61	56	50	44	37	62

Size 710

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
1570	5653	4	11	49	38	33	27	21	15	<15	<15	30
1963	7066	5	18	53	45	39	34	28	22	15	<15	37
2355	8480	6	25	56	50	45	40	34	28	21	<15	42
2748	9893	7	34	59	54	49	44	39	33	27	20	46
3141	11306	8	45	61	57	53	49	43	38	32	24	50
3533	12720	9	56	62	59	56	52	47	42	36	28	54
3926	14133	10	70	63	61	59	56	51	45	39	32	57
4318	15546	11	85	65	63	62	59	54	48	42	35	60
4711	16959	12	101	66	65	64	62	57	51	45	38	63

Size 800

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, occ.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
1996	7184	4	11	49	39	33	27	22	16	<15	<15	30
2494	8980	5	17	53	45	40	34	29	23	16	<15	37
2993	10776	6	25	56	50	45	40	34	29	22	<15	42
3492	12572	7	34	59	54	50	45	39	34	27	20	47
3991	14368	8	44	60	57	54	49	44	38	32	25	51
4490	16164	9	55	62	59	57	53	48	42	36	29	54
4989	17960	10	68	63	61	60	56	51	45	39	32	58
5488	19756	11	83	64	63	62	60	55	48	43	36	60
5987	21552	12	98	66	65	64	62	58	51	45	39	63

Size 900

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, oct.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
2528	9100	4	11	49	39	34	28	23	16	<15	<15	31
3160	11375	5	17	53	45	40	35	30	24	17	<15	38
3792	13650	6	24	57	51	46	41	35	29	23	15	43
4424	15925	7	33	59	54	51	46	40	35	28	21	48
5056	18200	8	43	61	58	54	50	45	39	33	26	52
5687	20475	9	55	62	60	58	54	49	43	37	30	55
6319	22750	10	67	63	62	60	57	52	46	40	33	58
6951	25025	11	81	65	64	63	60	56	49	43	37	61
7583	27300	12	97	66	66	65	63	58	52	46	40	64

Size 1000

‡		v_{tot}	Δp	$L_{W, oct.}$ in dB, $f_{m, occ.}$ in Hz								L_W in dB(A)
in l/s	in m³/h	in m/s	in Pa	63	125	250	500	1000	2000	4000	8000	
3123	11242	4	11	50	40	35	29	24	18	<15	<15	32
3903	14052	5	17	54	46	42	37	31	25	18	<15	39
4684	16863	6	24	57	52	47	42	37	31	24	17	44
5465	19673	7	33	59	55	52	47	42	36	30	22	49
6246	22484	8	43	61	59	56	51	46	41	34	27	53
7026	25294	9	54	63	61	59	55	50	44	38	31	56
7807	28105	10	67	64	63	62	59	54	48	42	35	60
8588	30915	11	81	65	65	64	62	57	51	45	38	63
9368	33726	12	96	66	67	66	64	60	53	48	41	65

Insertion Loss CF · CS

Insertion Loss D_e

From the test conditions described in DIN EN ISO 7235, the duct/reverberation chamber method was chosen. This method involves an empty duct being exposed to a noise, the third octave levels of which are measured in the connecting reverberation chamber under defined conditions. The attenuator to be tested is then inserted in the empty duct and the measurement repeated. The difference between the two measurements is the “insertion loss D_e”.

The octave values are calculated from the third octave measurements. Data measured in Trox Laboratory to DIN EN ISO 7235.

Laboratory measurements exceeding 50 dB are indicated as 50 dB, in line with common practice.

Insertion loss $D_{e,\,oct.}$ in dB

Type CF 025 … / CS 025; Insulation thickness = 25 mm

Length L = 500 mm

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	1	2	4	9	20	16	15	10
100	1	1	4	8	17	14	12	9
125	1	1	3	8	15	11	9	7
160	1	1	2	5	14	10	8	6
200	1	1	2	5	14	9	6	5
250	0	1	2	5	13	8	5	4
315	0	1	1	4	9	7	4	3
400	0	0	1	3	6	5	3	3

Length L = 1000 mm

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	3	5	10	21	44	46	37	23
100	2	3	8	17	44	34	28	21
125	2	3	7	17	43	30	24	17
160	1	1	4	12	40	27	20	16
200	1	1	3	11	35	22	16	13
250	1	1	3	11	30	19	12	10
315	0	1	3	9	21	10	12	8
400	0	1	3	8	16	8	8	7

Length L = 1500 mm

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	3	5	13	28	47	48	44	31
100	2	4	12	24	47	41	34	26
125	2	3	10	22	45	34	28	20
160	2	2	6	16	42	30	25	19
200	2	2	5	15	41	27	19	15
250	1	2	5	15	38	25	14	11
315	1	2	4	12	27	19	13	10
400	1	1	4	10	23	17	11	8

Length L = 2000 mm **(only Type CF)**

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	3	6	15	35	50	50	50	39
100	2	5	15	30	50	49	41	31
125	2	4	12	28	48	37	32	23
160	2	3	8	20	47	34	28	21
200	1	3	7	19	47	32	20	16
250	1	3	6	17	43	30	15	13
315	1	2	6	14	32	27	13	11
400	1	2	4	10	23	22	11	9

Type CF 050 … / CS 050; Insulation thickness = 50 mm

Length L = 500 mm

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	4	5	11	20	30	27	16	12
100	3	4	9	17	24	21	12	10
125	2	3	7	14	20	16	11	9
160	2	2	6	12	17	14	8	6
200	1	2	5	12	16	11	6	5
250	1	2	4	12	15	8	5	4
315	1	1	3	9	12	6	4	3
400	1	1	3	7	9	6	4	3

Length L = 1000 mm

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	8	14	23	47	50	50	44	27
100	7	10	21	38	50	50	29	22
125	5	7	16	32	50	42	25	22
160	4	5	12	26	47	34	20	16
200	3	5	11	25	45	26	16	13
250	2	4	9	25	40	19	12	10
315	1	4	8	22	28	13	12	8
400	0	4	8	18	23	11	10	7

Length L = 1500 mm

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	11	14	33	48	50	50	47	37
100	10	11	27	44	50	50	37	30
125	7	9	21	41	50	46	33	27
160	5	7	17	37	48	42	24	19
200	4	6	14	37	48	34	18	15
250	3	5	11	35	45	25	14	11
315	2	4	10	26	35	19	12	10
400	2	4	9	20	26	17	11	8

Length L = 2000 mm **(only Type CF)**

Size	$f_{m,\,oct.}$ in Hz							
	63	125	250	500	1k	2k	4k	8k
80	15	15	42	50	50	50	50	47
100	12	12	34	50	50	50	46	37
125	9	11	27	50	50	50	40	31
160	6	9	22	48	50	50	29	21
200	5	8	18	47	50	42	22	18
250	4	6	15	45	50	30	16	13
315	3	4	12	33	41	27	14	11
400	3	3	9	22	29	22	11	9

Order Details CA · CB

Specification text Type CA050 or CA 100

Type CA circular attenuator for ventilation systems; insertion loss tested to DIN EN ISO 7235. Absorption material non-combustible mineral wool to DIN 4102 A2; with glass fibre scrim facing covered with perforated plate. Casing and perforated inner duct galvanised sheet steel.

Dimensions:

Size

Length in mm

Insulation thickness in mm

Volume flow in m^3/h (in l/s)

Insertion loss in dB at 250 Hz octave centre frequency

Item

Type (in accordance with order code; see below) CA...

Manufacturer TROX

Specification Text Type CB050 or CB100

Type CB circular attenuator for ventilation systems; insertion loss tested to DIN EN ISO 7235. Fitted with a sound absorbing pod. Absorption material non-combustible mineral wool to DIN 4102 A2; with glass fibre scrim facing, covered with perforated plate. Casing and perforated inner duct galvanised sheet steel.

Dimensions:

Size

Length in mm

Insulation thickness in mm

Volume flow in m^3/h (in l/s)

Insertion loss in dB at 250 Hz octave centre frequency

Max. permitted flow resistance in Pa (pressure-loss)

Item

Type (in accordance with order code; see below) CB...

Manufacturer TROX

Order Code

Example: **CB 100** / **315 x 1000** / **GE** / **VF1**

- Type CA (without pod) / Type CB (with pod) [1]
- Insulation thickness in mm [2]
- Size
- Length in mm

Connection Variations:

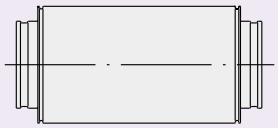
- 000 = Plug type spigot
- VF1 = Flange on end [3]
- VF2 = Flange both ends
- VD2 = Lip seal both ends

Matching Flange(s)

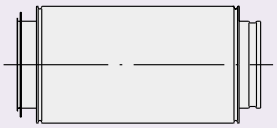
- 00 = without
- GE = one end
- GZ = both ends

1) In type CB: Coned at air inlet end
2) 50 mm up to size 400 possible. (If insulation details are missing from the order, standard delivery is 100 mm.)
3) In type CB.../VF1: Standard flange and cone at the same end.

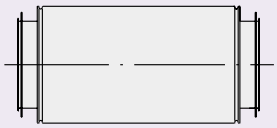
Connection variations



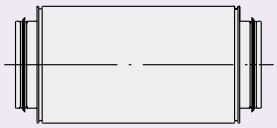
Plug type - 000 -



Flange one end - VF1 -



Flange both ends - VF2 -



Lip Seal - VD2 -
Size 100…400

Order Details CF · CS

Specification Text Type CF 025 and CF 050

Flexible duct attenuator Type CF for ventilation systems. Suitable for attenuation of fan noise and reduction of sound transmission to adjacent rooms. Insertion loss tested to DIN EN ISO 7235. Aluminium external case and perforated internal aluminium duct. Absorption material non-combustible to DIN 4102 A2. On plug type inlet and outlet spigots lip seals can be supplied separately and fitted on site by others.

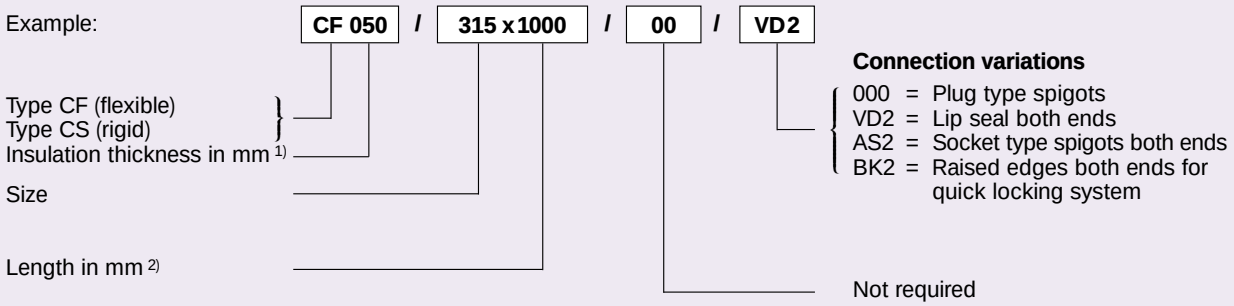
Dimensions:	
Size	
Length in mm	
Insulation thickness in mm	
Volume flow in m^3/h (in l/s)	
Insertion loss in dB at 250 Hz octave centre frequency	
Item	
Type (in accordance with order code; see below)	CF...
Manufacturer	TROX

Specification Test Type CS 025 and CS 050

Rigid attenuator Type CS for ventilation systems. Suitable for attenuation of fan noise and reduction of sound transmission to adjacent rooms. Rigid construction of Type CF. External case and perforated inner duct are aluminium. Absorption material non-combustible to DIN 4102 A2. On plug type inlet and outlet spigots lip seals can be supplied separately and fitted on site by others.

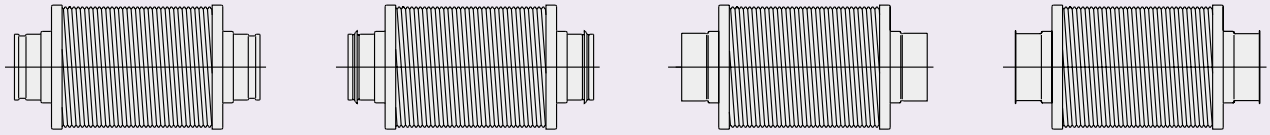
Dimensions:	
Size	
Length in mm	
Insulation thickness in mm	
Volume flow in m^3/h (in l/s)	
Insertion loss in dB at 250 Hz octave centre frequency	
Item	
Type (in accordance with order code; see below)	CS...
Manufacturer	TROX

Order Code



1) 25 and 50 mm available. (Standard 50 mm supplied if packing thickness not stated on order).
2) Type CS maximum length 1500 mm. Type CF maximum length 2000 mm.

Connection variations (Type CF shown)



Plug type spigots - 000 - | Lip seal - VD2 - | Socket type spigots - AS2 - | Raised edge - VD2 -