

Circular silencers

Type CS



For the reduction of noise in circular ducts, aluminium construction

Circular silencers, in rigid aluminium construction, for the reduction of noise in the circular ducts of air conditioning systems

- Absorption material is non-combustible mineral wool with RAL quality mark, biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
- Casing and perforated inner duct made of aluminium
- Variant with spigot has a groove for a lip seal, suitable for circular connecting ducts to EN 1506 or EN 13180
- Insertion loss measured according to ISO 7235
- Casing air leakage to EN 15727, class D

Optional equipment and accessories

- Socket-type spigots on both ends
- Raised edges at both ends
- With lip seals on both ends

Type		Page
CS	General information	CS – 2
	Technical data	CS – 3
	Quick sizing	CS – 4
	Specification text	CS – 7
	Order code	CS – 8
	Variants	CS – 9
	Dimensions and weight	CS – 10
	Installation details	CS – 13
	Basic information and nomenclature	CS – 14

Application

Application

- Circular silencers Type CS for the reduction of air-regenerated noise in the circular ducts of air conditioning systems
- For the reduction of air-regenerated noise of air terminal units LVC and TVR, and of mechanical self-powered controllers RN and VFC
- For the reduction of fan noise
- Can be used as cross talk silencer to reduce the transfer of noise through ducts between

neighbouring rooms

Special features

- Insertion loss measured according to ISO 7235
- Absorption material is non-combustible
- Insulation thickness 25 mm or 50 mm

Nominal sizes

- 80, 100, 125, 160, 200, 250, 315, 400 mm

Description

Variants

- 025: Circular silencer with 25 mm insulation
- 050: Circular silencer with 50 mm insulation
- AS2: Circular silencer with socket-type spigots on both ends
- BK2: Circular silencer with raised edges at both ends

aluminium

- Lining is mineral wool
- End pieces made ABS plastic, flammability to UL 94, V-0 (nominal sizes 80 – 125)
- End pieces made of aluminium (nominal sizes 160 – 400)

Parts and characteristics

- Casing
- Perforated inner tube
- Absorption material

Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
- Inert to fungal and bacterial growth

Accessories

- VD2: With lip seals on both ends
- AS2: Socket-type spigots on both ends
- BK2: Raised edges at both ends

Construction features

- Circular casing
- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal
- Maximum operating pressure 1000 Pa
- Max. operating temperature 100 °C

Standards and guidelines

- Insertion loss measured according to ISO 7235
- Casing air leakage to EN 15727, class D

Maintenance

- Maintenance-free as construction and materials are not subject to wear

Materials and surfaces

- Casing and perforated inner duct made of

Nominal sizes	80 – 400 mm
Operating pressure	1000 Pa max.
Operating temperature	100 °C max.

The stated differential pressures for circular silencers correspond to the values for smooth pipes. Deviations, if any, are of no practical relevance.

For ductwork calculation, if the length of a circular silencer is included in the total length of the ductwork, no extra length must be added.

CS025 (insulation thickness 25 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
80	500	1	2	4	9	20	16	15	10
	1000	3	5	10	21	44	46	37	23
	1500	3	5	13	28	47	48	44	31
100	500	1	1	4	8	17	14	12	9
	1000	2	3	8	17	44	34	28	21
	1500	2	4	12	24	47	41	34	26
125	500	1	1	3	8	15	11	9	7
	1000	2	3	7	17	43	30	24	17
	1500	2	3	10	22	45	34	28	20
160	500	1	1	2	5	14	10	8	6
	1000	1	1	4	12	40	27	20	16
	1500	2	2	6	16	42	30	25	19
200	500	1	1	2	5	14	9	6	5
	1000	1	1	3	11	35	22	16	13
	1500	2	2	5	15	41	27	19	15
250	500	0	1	2	5	13	8	5	4
	1000	1	1	3	11	30	19	12	10
	1500	1	2	5	15	38	25	14	11
315	500	0	1	1	4	9	7	4	3
	1000	0	1	3	9	21	10	12	8
	1500	1	2	4	12	27	19	13	10
400	500	0	0	1	3	6	5	3	3
	1000	0	1	3	8	16	8	8	7
	1500	1	1	4	10	23	17	11	8

CS050 (insulation thickness 50 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
80	500	4	5	11	20	30	27	16	12
	1000	8	14	23	47	50	50	44	27
	1500	11	14	33	48	50	50	47	37
100	500	3	4	9	17	24	21	12	10
	1000	7	10	21	38	50	50	29	22
	1500	10	11	27	44	50	50	37	30
125	500	2	3	7	14	20	16	11	9
	1000	5	7	16	32	50	42	25	22
	1500	7	9	21	41	50	46	33	27
160	500	2	2	6	12	17	14	8	6
	1000	4	5	12	26	47	34	20	16
	1500	5	7	17	37	48	42	24	19
200	500	1	2	5	12	16	11	6	5
	1000	3	5	11	25	45	26	16	13
	1500	4	6	14	37	48	34	18	15
250	500	1	2	4	12	15	8	5	4
	1000	2	4	9	25	40	19	12	10
	1500	3	5	11	35	45	25	14	11
315	500	1	1	3	9	12	6	4	3
	1000	1	4	8	22	28	13	12	8
	1500	2	4	10	26	35	19	12	10
400	500	1	1	3	7	9	6	4	3
	1000	1	4	8	18	23	11	10	7
	1500	2	4	9	20	26	17	11	8

CS, differential pressure

Nominal size	\dot{V}	\dot{V}	Nennlänge [mm]		
			500	1000	1500
	l/s	m ³ /h	Δp_{st} Pa		
80	20	72	2	4	6
	40	144	6	12	16
	50	180	8	16	25
	55	198	12	25	35
100	30	108	2	2	4
	60	216	4	8	12
	75	270	6	12	18
	90	324	8	18	25
125	50	180	2	2	4
	95	342	4	6	10
	120	432	6	10	14
	145	522	6	14	20
160	80	288	2	2	2
	155	558	2	6	8
	195	702	4	8	10
	235	846	6	10	14
200	125	450	2	2	2
	245	882	2	4	6
	310	1116	4	6	8
	370	1332	4	8	10
250	195	702	<2	<2	<2
	385	1386	<2	4	4
	485	1746	2	4	6
	580	2088	4	6	8
315	310	1116	<2	<2	<2
	615	2214	<2	2	4
	770	2772	<2	4	4
	925	3330	2	4	6
400	500	1800	<2	<2	<2
	995	3582	<2	<2	2
	1245	4482	<2	2	4
	1495	5382	<2	4	4

Sizing example

Given data

Circular duct nominal size 160
 $\dot{V} = 195 \text{ l/s (702 m}^3\text{/h)}$
 $D_e = 5 \text{ dB at 250 Hz}$

Quick sizing

CS025, length 1500 mm
 CS050, length 500 mm

Selected

CS050, length 500 mm
 $\Delta p_{st} = 4 \text{ Pa}$

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Circular silencers for air conditioning systems, rigid construction, available in 8 nominal sizes. Insertion loss measured according to ISO 7235. Casing with acoustic and thermal insulation. Spigot with groove for lip seal, suitable for circular connecting ducts to EN 1506 or EN 13180. Casing air leakage to EN 15727, class D.

Special features

- Insertion loss measured according to ISO 7235
- Absorption material is non-combustible
- Insulation thickness 25 mm or 50 mm

Materials and surfaces

- Casing and perforated inner duct made of aluminium
- Lining is mineral wool
- End pieces made ABS plastic, flammability to UL 94, V-0 (nominal sizes 80 – 125)
- End pieces made of aluminium (nominal sizes 160 – 400)

Mineral wool

- To EN 13501, fire rating class A1, non-combustible

- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
- Inert to fungal and bacterial growth

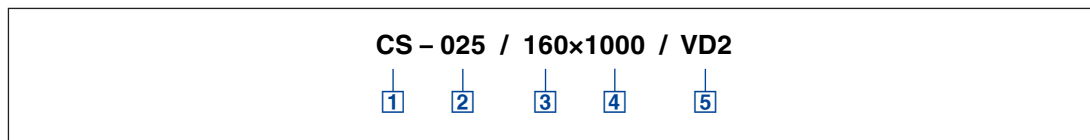
Technical data

- Nominal sizes: 80 to 400 mm
- Operating pressure: 1000 Pa max.
- Operating temperature: 100 °C max.

Sizing data

- D _____
[mm]
- H _____
[mm]
- Insulation thickness _____
[mm]
- \dot{V} _____
[m³/h]
- D_e at 250 Hz _____
[dB]
- Δp_{st} _____
[Pa]

CS



1 Type

CS Circular silencer

2 Insulation thickness [mm]

025 25

050 50

3 Nominal size [mm]

80

100

125

160

200

250

315

400

Order example: CS050/250×1500/VD2

Insulation thickness	50 mm
Nominal size	250 mm
Length	1500 mm
Type of connection	Spigot with lip seal on both ends

4 Nominal length [mm]

500

1000

1500

5 Type of connection

No entry: spigot

VD2 Spigot with lip seal on both ends

AS2 Socket-type spigots on both ends

BK2 Raised edges at both ends

CS

Variant

- Circular silencer for the reduction of noise
 - Spigot
-

CS/.../AS2

Variant

- Circular silencer for the reduction of noise

- Socket-type spigots to make connections to the ducting
-

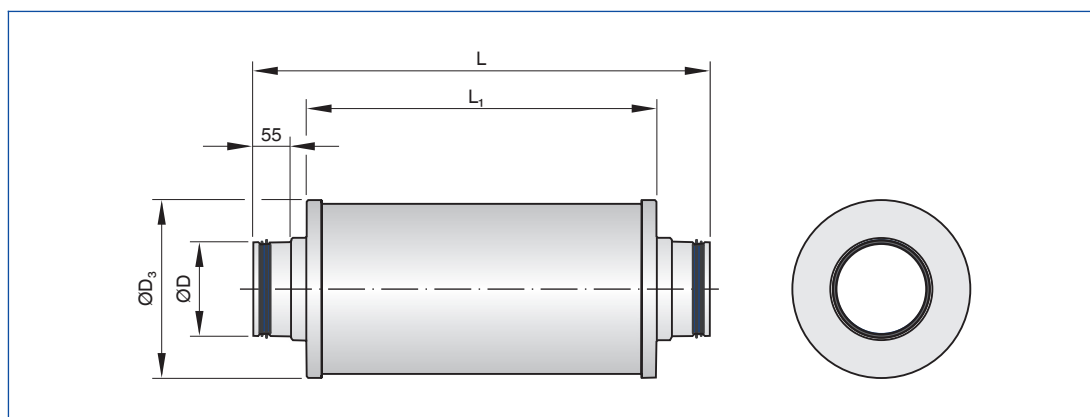
CS/.../BK2

Variant

- Circular silencer for the reduction of noise

- With raised edges to make detachable connections to the ducting

CS



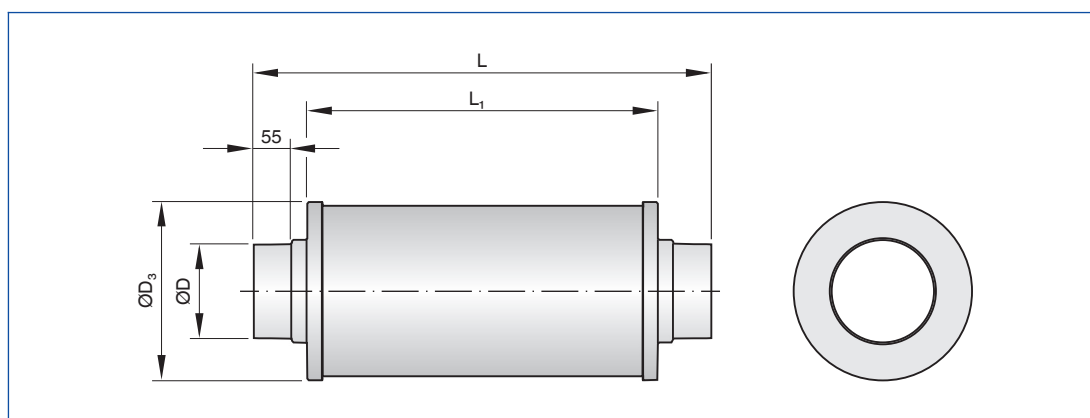
CS, dimensions

Nominal size	CS-025	CS-050	ØD mm
	ØD ₃ mm		
80	135	192	79
100	160	212	99
125	191	236	124
160	221	271	159
200	261	311	199
250	311	366	249
315	376	426	314
400	461	511	399

CS, lengths

Nominal length	L mm	L ₁ mm
	500	650
1000	1150	1000
1500	1650	1500

CS/.../AS2



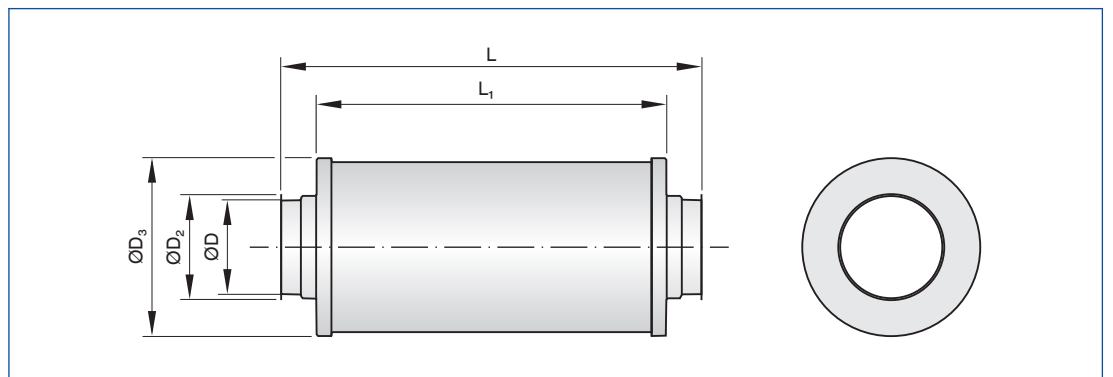
CS/.../AS2, dimensions

Nominal size	CS-025		CS-050		ØD mm
	ØD ₃				
	mm		mm		
80	135		192		80
100	160		212		100
125	191		236		125
160	221		271		160
200	261		311		200
250	311		366		250
315	376		426		315
400	461		511		400

CS/.../AS2, lengths

Nominal length	L		L ₁	
	mm		mm	
500	650		500	
1000	1150		1000	
1500	1650		1500	

CS/.../BK2



CS/.../BK2, dimensions

Nominal size	CS-025		CS-050		ØD mm	ØD ₂ mm
	ØD ₃					
	mm		mm			
80	135		192		79	93
100	160		212		99	113
125	191		236		124	138
160	221		271		159	173
200	261		311		199	213
250	311		366		249	263
315	376		426		314	328
400	461		511		399	413

CS/.../BK2, lengths

Nominal length	L		L ₁	
	mm		mm	
500	638		500	
1000	1138		1000	
1500	1638		1500	

CS

Nominal size	CS-025			CS-050		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
80	1.0	1.8	2.6	1.4	2.6	3.7
100	1.2	2.1	3.1	1.6	2.9	4.2
125	1.4	2.5	3.7	1.9	3.3	4.7
160	1.6	2.9	4.2	2.1	3.8	5.4
200	2.0	3.6	5.2	2.6	4.6	6.5
250	2.5	4.4	6.2	3.1	5.5	7.8
315	2.9	5.2	7.5	3.5	6.2	8.9
400	3.7	6.6	9.4	4.5	7.9	11.3

Installation and commissioning

- Any installation orientation
- Installation in ducts outside of closed rooms requires sufficient protection against the effects of weather

Principal dimensions

ØD [mm]

Outer diameter of the spigot

ØD₃ [mm]

Outer diameter of circular silencers

L [mm]

Length of attenuator/silencer including spigot (in airflow direction)

L₁ [mm]

Length of acoustic cladding and acoustically effective length

B [mm]

Attenuator width and duct width (upright splitters)

H [mm]

Attenuator height and duct height (upright splitters)

T [mm]

Splitter thickness

S [mm]

Airway width

n []

Number of flange screw holes

m [kg]

Weight

Nomenclature

f_m [Hz]

Octave band centre frequency

L_{WA} [dB(A)]

A-weighted sound power level of air-regenerated noise

D_e [dB]

Insertion loss

Ṃ [m³/h] and [l/s]

Volume flow rate

Δp_{st} [Pa]

Static differential pressure

All sound power levels are based on 1 pW.

All values were measured in a TROX lab and to EN ISO 7235. Intermediate values may be achieved by interpolation.

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