RECTANGULAR SPLITTER SILENCER

TYPE CS SILENCERS

Of splitter design, Type CS silencers are built from standard components to give virtually any attenuation required in normal practice for axial or centrifugal fans.

The design is extremely flexible. Air passage widths are varied to provide the requisite low and high frequency attenuation. The number of air passages in parallel and their height are arranged to meet resistance to air flow requirements. Different lengths provide for the amount of attenuation required.

Experience shows that a great majority of requirements can be satisfied by the range of standard sizes listed in ***Table 1***. However, special arrangements can be offered where applications call for differences in attenuation, sizes or resistance to air flow.

The silencers have pre-galvanised steel casings with galvanised external flanges of rectangular cross section. The splitters and side wall linings are of resin bonded mineral wool faced with woven glass fibre material which prevents the mineral wool being eroded into the air stream. The splitters are held in pre-galvanised steel frames and are rot-proof and fire-proof.

The following airway velocities generally should not be exceeded for the ventilated space noise levels tabulated in order to avoid possible noise regeneration in the silencer.

Airway Velocity =

$$\frac{\text{Volume Flow Rate m}^3\text{ / s}}{\text{Number Of Airways x Airways Width x Height (metres)}}$$

FPM	Velocity m/s	NC/NR Level
2955	15	45-50
2561	13	35-40
1970	10	30

Table 1

Attenuation by 200mm thick sound absorbing splitter modules in a duct

Length mm	Air Passage Width mm	Attenuation in dB in octave bands *Hz* 63	125	250	500	1000	2000	4000	8000
900	50	8	16	27	45	55	55	55	50
1200	50	10	20	36	55	55	55	55	55
1500	50	13	24	42	55	55	55	55	55
1800	50	15	30	51	55	55	55	55	55
2100	50	17	34	55	55	55	55	55	55
2400	50	19	38	55	55	55	55	55	55
900	75	6	11	19	34	45	45	39	28
1200	75	7	14	26	46	55	55	52	38
1500	75	9	17	30	48	55	55	55	42
1800	75	10	20	34	50	55	55	55	46
2100	75	12	23	40	55	55	55	55	55
2400	75	13	26	45	55	55	55	55	55
900	100	5	9	16	30	39	39	31	26
1200	100	6	12	23	40	51	51	41	29
1500	100	8	15	26	43	53	53	45	32
1800	100	9	17	30	47	55	55	49	36
2100	100	11	20	35	55	55	55	55	43
2400	100	12	23	40	55	55	55	55	47
900	125	4	7	13	25	32	32	23	15
1200	125	5	9	19	33	42	42	30	18
1500	125	7	12	22	38	47	47	34	20
1800	125	8	14	26	43	52	52	39	23
2100	125	9	17	30	50	55	51	46	28
2400	125	10	19	34	55	55	55	52	32
900	150	3	6	11	20	25	25	15	8
1200	150	4	7	15	26	23	33	19	11
1500	150	5	9	18	33	41	41	24	13
1800	150	6	11	22	39	49	49	29	16
2100	150	7	13	26	45	55	55	34	19
2400	150	8	15	29	52	55	55	39	21
900	175	2	5	9	17	21	21	13	5
1200	175	3	6	13	22	28	28	16	7
1500	175	4	8	15	28	35	35	21	8
1800	175	5	9	19	33	42	42	25	9
2100	175	6	11	22	39	49	49	29	11
2400	175	7	13	25	45	55	55	33	11
900	200	1	4	8	15	19	19	11	3
1200	200	2	5	11	20	25	25	14	4
1500	200	3	7	13	25	31	31	18	5
1800	200	4	8	17	29	37	37	22	7
2100	200	5	10	20	34	43	43	25	7
2400	200	6	11	22	39	49	49	29	8

RECTANGULAR SPLITTER SILENCER

PRESSURE LOSS CALCULATION

Pressure loss are introduced into an air handling system by the installation of a silencer. The following calculations are used to determine these pressure losses due to the silencer.

$$\text{Pressure Loss (PD)} = \left(\frac{Q \times k}{W \times H} \right)^2 \text{ Pascals}$$

Where Q = AIR QUANTITY litres/sec

W = WIDTH OF SILENCER mm

H = HEIGHT OF SILENCER mm

k = VARIABLE (from tables below)

VALUES of k for TYPE CS ROUND NOSE / TAPPERED TAIL

Module Width mm	Airway Width mm	% Open Area	LENGTH OF SILENCER mm					
			900	1200	1500	1800	2100	2400
250	50	20	2225	2350	2500	2660	2790	2900
275	75	27	1530	1642	1740	1850	1949	2035
300	100	33	1210	1310	1379	1457	1535	1593
325	125	38	1015	1076	1139	1202	1256	1308
350	150	43	872	927	970	1022	1069	1115
375	175	47	762	803	841	877	913	949
400	200	50	672	702	736	770	798	818

PRESSURE DROP

The pressure drop results provide “IN DUCT” pressure loss only and do not account for any dynamic losses beyond the ends of the silencer. For application other than “IN DUCT” installation Systemair’s engineers would be pleased to discuss your design requirements.

EXAMPLE : TYPE CS rectangular silencer with 325 module width
AIR QUANTITY = 7410 l/s
HEIGHT OF SILENCER = 1000mm
WIDTH OF SILENCER = 975 mm
LENGTH = 2100 mm
k from table above = 1256

$$PD = \left(\frac{7410 \times 1256}{975 \times 1000} \right)^2$$

$$= 91 \text{ Pascals}$$

RECTANGULAR SPLITTER SILENCER

CODING : TYPE CS/CSE SILENCERS

CODE :

VARIANT

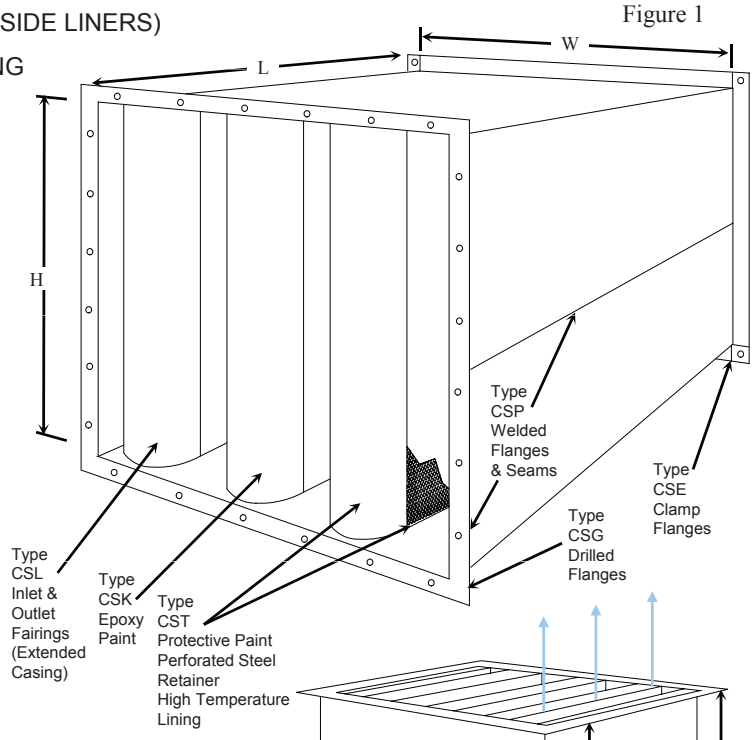
- **CS =** DRILLED FLANGES (WITH SIDE LINERS)
- **CSG =** DRILLED FLANGES (WITHOUT SIDE LINERS)
- **CSE =** CLAMP FLANGES (WITHOUT SIDE LINERS)
- **CSM =** MOISTURE RESISTANT LINING
- **CSL =** LOW PRESSURE LOSS
- **CSP =** HIGH SYSTEM PRESSURE
- **SCT =** HIGH TEMPERATURE
- **CSK =** FUME RESISTANT

EXAMPLE :

CS EM / 75-X-X-X

- Type
- Variants
- Airway Width mm
- Silencer Length mm
- Width mm
- Height mm

Figure 1



CODING : TYPE CBS SILENCERS

CODE : CBS (HorV)
Plus Variants
As for type CS

H or **V** = Bend in Horizontal or Vertical plane

EXAMPLE :

CBS (H) (V) EM / 75-X-X-X-X

- Type
- Variants
- Airways Width mm
- Air Entry Leg Dimension I_1 mm
- Air Exit Leg Dimension L_1 mm
- Silencer Width mm
- Height mm

TYPE CBSVG

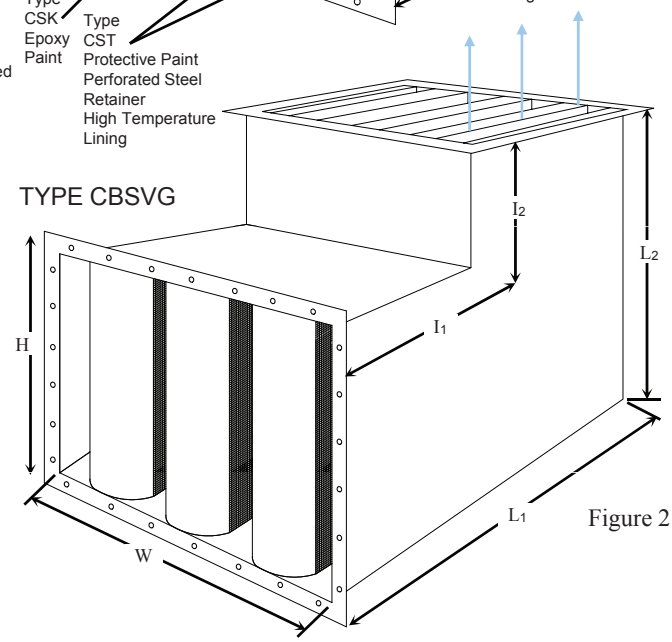
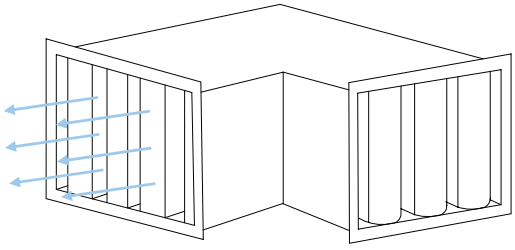


Figure 2



TYPE CBSHE

$I_1 + I_2$ Minimum Dimension 100m
(300mm with Fairings Type CBSHL)

RECTANGULAR SPLITTER SILENCER

DIMENSIONS AND WEIGHTS

TYPE CS/CSE/150mm AIRWAY

Number of Modules	Height B mm	Approx. Weight in kg for length below			
		900 mm	1200 mm	1500 mm	1800 mm
1	300	26	32	39	44
	450	32	39	48	55
	600	37	46	56	64
2	300	44	54	65	75
	450	51	62	79	91
	600	58	73	90	103
	750	70	86	106	120
	900	78	96	118	133
	1050	92	113	138	154
3	450	76	91	117	133
	600	85	106	131	149
	750	102	125	153	172
	900	112	137	168	189
	1050	121	149	184	207
	1200	130	161	199	223
	1350	156	184	222	253
	1500	170	205	243	282
4	600	106	133	166	189
	750	128	157	193	218
	900	140	171	212	239
	1050	150	185	230	260
	1200	160	199	249	280
	1350	192	235	294	331
	1500	203	247	313	353
5	900	168	206	255	288
	1050	179	223	277	312
	1200	191	239	298	336
	1350	230	281	353	399
	1500	242	296	375	423

Note : A and B are internal casing dimensions.

Dimension 'A'=(Airway width+200) x No. of modules.
Flange widths 'E' are as follows :
Longest side up to 900mm – flange width E = 40mm.
Longest side above 900mm – flange width E = 50mm.
Dimension 'J'
= Dim. 'B'+50mm when dim. 'E' = 40mm.
= Dim. 'B'+60mm when dim. 'E' = 50mm.
Dimension 'K'
= Dim. 'A'+50mm when dim. 'E' = 40mm.
= Dim. 'A'+60mm when dim. 'E' = 50mm.

Fixing Hole pitches 'F' are in all cases 150mm, clearance Holes for M10 screws. N must not be less than 50mm.

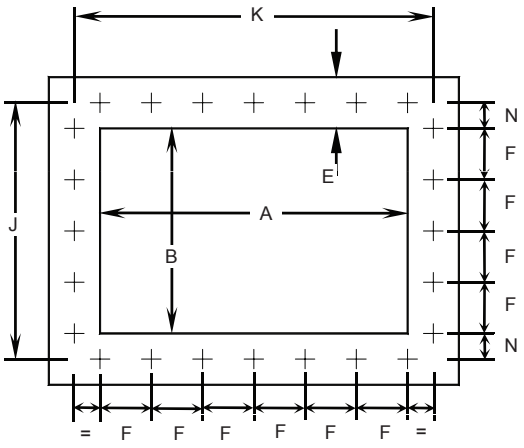
$$\text{Number of Modules} = \frac{\text{Width}}{\text{Airway size + 200mm}}$$

Example :

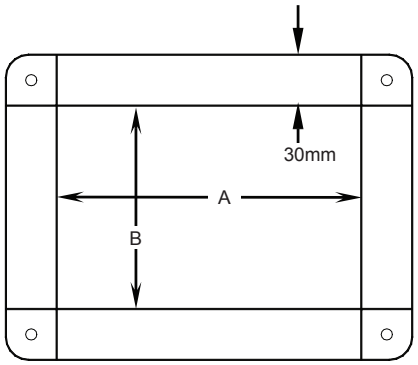
CS/100-900-600-600

$$\text{Number of Modules} = \frac{600}{100 + 200\text{mm}} = 2 \text{ modules}$$

DIMENSIONS
TYPE CS AND CBS SILENCERS



TYPE CSE SILENCERS CLAMPED FLANGE



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