

Climate Recovery Duct System Planning Guide – CR Duct vs Duct Silencer



Overview

Climate Recovery has previously employed the Swedish Statens Provningsanstalt (SP Certification) to perform measurements of the CR Duct sound-absorbing properties. Recently, complimentary measurements were performed with the help of Swegon, a Swedish air-handling manufacturer. All current measurements confirm those previously performed, though to a more definitive degree. All measurements were performed on the 1/3rd octave band level. The lowest sound damping values of all measurements were chosen.

Comparison

The following pages show the CR Duct of each diameter (Ø) against industry standard duct silencers of both 50mm and 100mm insulation thickness. All measurements are done in decibels (dB) with direct comparisons made between similar frequencies.

Example

Ø160 CR Duct 2,35m – 230mm outer diameter

Ø160 SLCU 100mm insulated silencer – 365mm outer diameter

All CR Ducts outer diameters are 60-70mm greater than internal diameter.

CR Duct silences 48 dB at 1k Hz while SLCU dampens by 11.

(11-46) makes the Difference of -37, noted with a star (*).

The Minimum CR Length is what is required to match the silencing of the SLCU device in direct relation to the Difference, in this example 0,5 meters.

The red figure is the critical frequency point, meaning the most CR Duct required in this specific comparison. Here, **2,3** meters of Ø160 CR Duct is required to match the silencing of 8k Hz by the Ø160 SLCU 100mm.

Finally, the weight of the CR Duct is 2,9 kg lighter than the silencer.

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	160	2350	2,8	5(dB)	5	8	36	48	25	15	8
SLCU 100	160	300	5,7	4	3	6	8	11	14	9	8
Difference (SLCU-CR)			2,9	-1	-2	-2	-28	-37*	-11	-6	0
Minimum CR Length (m)				1,8	1,4	1,7	0,5	0,5	1,3	1,4	2,3

Ø125 SLCU 50mm insulated silencer – 235mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	125	2350	2,2	5(dB)	4	6	20	43	31	16	8
SLCU 50	125	300	2,7	2	2	6	13	16	20	15	10
Difference (SLCU-CR)			0,5	-3	-2	0	-7	-27	-11	-1	2
Minimum CR Length (m)				0,9	1,2	2,3	1,5	0,9	1,5	2,2	2,9
SLCU 50	125	600	4,4	3	3	9	23	30	40	22	14
Difference (SLCU-CR)			2,2	-2	-1	3	3	-13	9	6	6
Minimum CR Length (m)				1,4	1,7	3,5	2,6	1,6	3,0	3,2	4,0
SLCU 50	125	900	6,2	4	4	12	33	45	50	30	17
Difference (SLCU-CR)			4,0	-1	0	6	13	2	19	14	9
Minimum CR Length (m)				1,8	2,3	4,6	3,8	2,4	3,7	4,3	4,9
SLCU 50	125	1200	7,5	5	5	15	43	50	50	38	21
Difference (SLCU-CR)			5,3	0	1	9	23	7	19	22	13
Minimum CR Length (m)				2,3	2,9	5,8	4,9	2,7	3,7	5,5	6,0

Ø125 SLCU 100mm insulated silencer – 325mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	125	2350	2,2	5(dB)	4	6	20	43	31	16	8
SLCU 100	125	300	5,2	5	4	9	11	16	19	15	10
Difference (SLCU-CR)			3,0	0	0	3	-9	-27	-12	-1	2
Minimum CR Length (m)				2,3	1,8	2,6	0,7	0,8	1,7	2,3	2,9
SLCU 100	125	600	7,5	7	7	16	20	28	37	24	14
Difference (SLCU-CR)			5,3	2	3	10	0	-15	6	8	6
Minimum CR Length (m)				3,2	3,2	4,6	1,3	1,3	3,4	3,7	4,0
SLCU 100	125	900	10,8	9	10	22	29	41	50	33	18
Difference (SLCU-CR)			8,6	4	6	16	9	-2	19	17	10
Minimum CR Length (m)				4,1	4,6	6,3	1,9	2,0	4,6	5,1	5,2
SLCU 100	125	1200	14,6	12	13	29	38	50	50	42	22
Difference (SLCU-CR)			12,4	7	9	23	18	7	19	26	14
Minimum CR Length (m)				5,5	6,0	8,3	2,4	2,4	4,6	6,4	6,3

Ø160 SLCU 50mm insulated silencer – 270mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	160	2350	2,8	5	5	8	36	48	25	15	8
SLCU 50	160	300	3	1	2	4	10	12	15	8	8
Difference (SLCU-CR)			0,2	-4	-3	-4	-26	-36	-10	-7	0
Minimum CR Length (m)				0,5	0,9	1,2	0,6	0,6	1,4	1,2	2,3
SLCU 50	160	600	5,4	2	3	7	19	27	29	14	11
Difference (SLCU-CR)			2,6	-3	-2	-1	-17	-21	4	-1	3
Minimum CR Length (m)				0,9	1,4	2,0	1,2	1,3	2,7	2,1	3,2
SLCU 50	160	900	7,5	2	4	10	28	42	43	20	15
Difference (SLCU-CR)			4,7	-3	-1	2	-8	-6	18	5	7
Minimum CR Length (m)				0,9	1,8	2,9	1,8	2,0	4,0	3,1	4,3
SLCU 50	160	1200	9,2	2	5	13	37	50	50	26	19
Difference (SLCU-CR)			6,4	-3	0	5	1	2	25	11	11
Minimum CR Length (m)				0,9	2,3	3,7	2,4	2,4	4,6	4,0	5,5

Ø160 SLCU 100mm insulated silencer – 365mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	160	2350	2,8	5	5	8	36	48	25	15	8
SLCU 100	160	300	5,7	4	3	6	8	11	14	9	8
Difference (SLCU-CR)			2,9	-1	-2	-2	-28	-37	-11	-6	0
Minimum CR Length (m)				1,8	1,4	1,7	0,5	0,5	1,3	1,4	2,3
SLCU 100	160	600	9,5	5	6	13	16	23	28	15	12
Difference (SLCU-CR)			6,7	0	1	5	-20	-25	3	0	4
Minimum CR Length (m)				2,3	2,8	3,7	1,0	1,1	2,6	2,3	3,5
SLCU 100	160	900	13	6	9	20	24	34	42	21	16
Difference (SLCU-CR)			13,2	1	4	12	-12	-14	17	6	8
Minimum CR Length (m)				2,8	4,1	5,8	1,5	1,6	3,9	3,2	4,6
SLCU 100	160	1200	17,4	8	12	27	32	46	50	28	20
Difference (SLCU-CR)			14,6	3	7	19	-4	-2	25	13	12
Minimum CR Length (m)				3,7	5,5	7,8	2,0	2,2	4,6	4,3	5,8

Ø200 SLCU 50mm insulated silencer – 310mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	200	2350	3,4	4	3	8	36	41	20	10	7
SLCU 50	200	300	4,1	1	2	5	8	10	11	5	5
Difference (SLCU-CR)			0,7	-3	-1	-3	-28	-31	-9	-5	-2
Minimum CR Length (m)				0,6	1,5	1,4	0,5	0,6	1,3	1,2	1,6
SLCU 50	200	600	6,9	2	3	7	16	21	23	9	8
Difference (SLCU-CR)			3,5	-2	0	-1	-20	-20	3	-1	1
Minimum CR Length (m)				1,2	2,3	2,0	1,0	1,2	2,6	2,1	2,6
SLCU 50	200	900	9,7	2	4	8	24	32	34	13	10
Difference (SLCU-CR)			6,3	-2	1	0	-12	-9	14	3	3
Minimum CR Length (m)				1,2	3,1	2,3	1,5	1,8	3,9	3,0	3,3
SLCU 50	200	1200	12	3	5	10	31	43	45	18	13
Difference (SLCU-CR)			8,6	-1	2	2	-5	2	25	8	6
Minimum CR Length (m)				1,7	3,8	2,9	2,0	2,4	5,2	4,1	4,3

Ø200 SLCU 100mm insulated silencer – 410mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	200	2350	3,4	4	3	8	36	41	20	10	7
SLCU 100	200	300	7,7	4	4	6	6	9	11	6	6
Difference (SLCU-CR)			4,3	0	1	-2	-30	-32	-9	-4	-1
Minimum CR Length (m)				2,3	3,1	1,7	0,4	0,5	1,3	1,4	2,0
SLCU 100	200	600	10,6	5	6	11	14	19	22	10	8
Difference (SLCU-CR)			7,2	1	3	3	-22	-22	2	0	1
Minimum CR Length (m)				2,9	4,6	3,2	0,9	1,1	2,5	2,3	2,6
SLCU 100	200	900	15,3	6	9	17	21	29	33	14	11
Difference (SLCU-CR)			9,9	2	6	9	-15	-12	13	4	4
Minimum CR Length (m)				3,5	6,9	4,9	1,3	1,6	3,8	3,2	3,6
SLCU 100	200	1200	19,4	7	11	22	29	38	45	18	13
Difference (SLCU-CR)			16,0	3	8	14	-7	-3	25	8	6
Minimum CR Length (m)				4,0	8,4	6,3	1,9	2,1	5,2	4,1	4,3

Ø250 SLCU 50mm insulated silencer – 365mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	250	2350	4,3	3	4	10	28	39	20	12	7
SLCU 50	250	300		Not offered							
Difference (SLCU-CR)											
Minimum CR Length (m)											
SLCU 50	250	600	8,6	3	2	7	13	17	16	8	6
Difference (SLCU-CR)			4,3	0	-2	-3	-15	-22	-4	-4	-1
Minimum CR Length (m)				2,3	1,2	1,6	1,1	1,0	1,8	1,5	2,0
SLCU 50	250	900	11,7	3	4	8	20	26	23	10	8
Difference (SLCU-CR)			7,3	0	0	-2	-8	-13	3	-2	1
Minimum CR Length (m)				2,3	2,3	1,8	1,6	1,5	2,6	1,9	2,6
SLCU 50	250	1200	15	4	5	9	26	35	30	12	10
Difference (SLCU-CR)			10,7	1	1	-1	-2	-4	10	0	3
Minimum CR Length (m)				3,1	2,9	2,1	2,1	2,1	3,5	2,3	3,3

Ø250 SLCU 100mm insulated silencer – 465mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	250	2350	4,3	3	4	10	28	39	20	12	7
SLCU 100	250	300		Not offered							
Difference (SLCU-CR)											
Minimum CR Length (m)											
SLCU 100	250	600	10,7	6	5	10	11	16	16	8	7
Difference (SLCU-CR)			6,4	3	1	0	-17	-23	-4	-4	0
Minimum CR Length (m)				4,6	2,9	2,3	0,9	0,9	1,8	1,5	2,3
SLCU 100	250	900	18,0	7	7	15	18	25	23	10	9
Difference (SLCU-CR)			13,7	4	3	5	-10	-14	3	-2	2
Minimum CR Length (m)				5,4	4,0	3,5	1,5	1,5	2,6	1,9	3,0
SLCU 100	250	1200	22,9	7	9	20	25	34	30	13	11
Difference (SLCU-CR)			18,6	4	5	10	-3	-5	10	1	4
Minimum CR Length (m)				5,4	5,2	4,6	2,1	2,0	3,5	2,5	3,6

Ø315 SLCU 50mm insulated silencer – 427mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	315	2350	5,2	2	9	15	29	35	19	11	6
SLCU 50	315	300		Not offered							
Difference (SLCU-CR)											
Minimum CR Length (m)											
SLCU 50	315	600	11,3	0	2	6	11	14	9	4	5
Difference (SLCU-CR)			6,1	-2	-7	-9	-18	-21	-10	-7	-1
Minimum CR Length (m)				0,0	0,5	0,9	0,9	0,9	1,1	0,8	1,9
SLCU 50	315	900	15,6	1	3	7	16	22	12	6	7
Difference (SLCU-CR)			10,4	-1	-6	-8	-13	-13	-7	-5	1
Minimum CR Length (m)				1,2	0,8	1,1	1,3	1,4	1,5	1,3	2,7
SLCU 50	315	1200	20,3	1	3	8	22	30	16	7	9
Difference (SLCU-CR)			15,1	-1	-6	-7	-7	-5	-3	-4	3
Minimum CR Length (m)				1,2	0,8	1,2	1,7	2,0	1,9	1,5	3,5

Ø315 SLCU 100mm insulated silencer – 510mm outer diameter

	Ø (mm)	Length (mm)	Weight (kg)	63 (Hz)	125	250	500	1k	2k	4k	8k
CR Duct	315	2350	5,2	2	9	15	29	35	19	11	6
SLCU 100	315	300		Not offered							
Difference (SLCU-CR)											
Minimum CR Length (m)											
SLCU 100	315	600	16,3	1	4	7	9	12	10	5	6
Difference (SLCU-CR)			11,1	-1	-5	-8	-20	-23	-9	-6	0
Minimum CR Length (m)				1,2	1,0	1,1	0,7	0,8	1,2	1,0	2,3
SLCU 100	315	900	22,3	2	6	12	14	19	15	7	8
Difference (SLCU-CR)			17,1	0	-3	-3	-15	-16	-4	-4	2
Minimum CR Length (m)				2,3	1,5	1,8	1,1	1,2	1,8	1,5	3,1
SLCU 100	315	1200	29,1	2	8	16	18	26	21	9	10
Difference (SLCU-CR)			23,9	0	-1	1	-11	-9	2	-2	4
Minimum CR Length (m)				2,3	2,0	2,5	1,4	1,7	2,5	1,9	3,8

Notes

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