VAV-CSB MP

Circular

VAV dampers with Belimo MP actuator type VAV-CSB MP

VAV-CSB air flow regulator can be used both for variable and constant flow and, if appropriate, for forced shut-off for both air supply and air exhaust

Application

- Regulating of air volumes to change the temperature or air quality in a room
- Control and regulate the supply air flow and exhaust air flow
- Airflow range can be set between two set values or as constant airflow

Material

- Galvanized steel

Composition

- Operating range is between 2 to 12 m/s
- Integrated flow measurement with seperate measurement nipples for control and manual measurement
- The casing of the damper is equipped with a EPDM rubber blade seal conforms to air tightness class C in accordance with EN1751
- Blade air tightness class 3 in accordance with EN1751 due to EPDM seal around the blade
- The VAV-damper can be placed in any position in accordance with the airflow direction
- Manual measurement of the air flow can be performed without disturbing the control circuit through a separate pressure outlet on the orifice plate of the flow variator
- All duct connections have spigot dimensions and are equipped with sealing rings made of rubber

Controls

- Controller type Belimo LMV-D3-MP of 5Nm (size 100 up to 500) and Belimo NMV-D3-MP of 10Nm (size 630) are pressure regulated actuators for pressure independent controls. Settings can be done by using the Assistant App* (smartphone) with NFC connection (Near Field Communication) or by using the service tool ZTH (PC-tool).
- Operating range 0-10V or 2-10V (Standard set on 2-10V)
- Units of airflow: l/s or m^3/h
- Minimum adjustable air volume set at air velocity at +/- 2m/s and maximum adjustable airvolume set at air velocity of 12m/s
- Differential pressure range Δp @ V_{nom} 38 - 500 Pa
- Running time over the full actuator range : 100s
- Power consumption 5 Nm: 2W, 3.5VA / 10 Nm: 3W , 5VA
- Supply voltage 24V AC/DC

* Assistant App available in App Store & Google Play Store
* For iPhone an ZIP-BT-NFC converter is needed!

Options

- Other communication types (ModBus, KNX) and other brands of servomotors available on request
- Insulated version **VAV-CSB-I** available upon request, satndard insulation thickness 50mm

Accessories

- Sound attenuator, type **SAR-G**
- Water heater, type **CWA**
- Electric heater, type **CVA**

Order example

- **VAV-CSB 100 + SAR 100**

Explanation:
VAV-CSB = Circular Airflow regulator type
100 = Diameter of the damper
SAR 100 = Sound attenuator type

Variable Volume valves (VAV)

Air flow Characteristics

VAV-CSB			Ø100				Ø125				Ø160				Ø200				Ø250			
		Vk [m/s]	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12
		Q [m³/h]	85	170	257	344	130	263	396	530	216	434	652	871	337	680	1027	1370	529	1065	1604	2144
p_s = 125 Pa	Lw [dB/Okt]	f [Hz] 63	34	41	46	50	40	48	52	58	43	51	55	61	49	57	61	67	52	62	65	71
		125	40	53	55	55	42	56	57	58	44	58	59	60	46	60	61	62	47	63	54	64
		250	37	49	50	54	38	51	53	57	41	53	55	59	43	55	57	61	45	58	60	63
		500	35	44	46	50	37	48	47	53	39	49	49	55	41	51	51	57	44	54	53	59
		1000	34	40	41	46	35	42	42	47	38	44	44	49	40	46	46	51	43	48	49	53
		2000	33	37	37	40	35	38	39	42	37	40	41	44	39	42	43	46	41	44	44	48
		4000	32	35	25	36	34	37	37	39	36	39	39	41	38	41	41	43	39	42	42	54
		8000	33	34	34	35	35	37	38	38	37	38	39	39	37	39	40	40	38	40	40	51
	Lw(A) [dB(A)]		39	46	48	51	40	47	52	55	45	48	52	55	44	52	56	58	46	54	58	61
p_s = 250 Pa	Lw [dB/Okt]	f [Hz] 63	38	44	49	58	45	52	56	65	49	55	59	69	55	61	66	76	54	60	64	72
		125	43	56	62	66	46	59	64	68	48	62	66	71	50	64	70	74	49	62	54	65
		250	42	53	58	62	45	57	60	64	47	57	62	67	49	60	65	70	46	58	60	63
		500	41	50	56	58	43	52	58	60	45	54	61	62	47	56	54	64	43	53	52	58
		1000	39	47	51	52	42	49	53	54	44	51	56	56	44	53	55	58	41	49	47	52
		2000	38	44	48	48	40	46	50	51	42	48	52	53	43	51	54	54	40	44	44	47
		4000	36	42	45	46	39	44	49	49	40	46	49	52	41	49	53	51	39	42	43	53
		8000	32	37	40	43	38	43	47	55	38	42	44	48	42	48	52	53	38	39	40	50
	Lw(A) [dB(A)]		47	53	56	58	47	54	59	60	51	56	59	62	53	60	63	65	46	52	57	61
p_s = 500 Pa	Lw [dB/Okt]	f [Hz] 63	42	46	54	57	50	54	62	65	56	60	68	71	61	65	73	76	64	68	76	79
		125	47	62	70	72	51	64	72	74	53	66	74	76	55	68	76	77	57	70	78	80
		250	46	59	67	68	50	61	69	70	50	63	71	72	54	65	72	72	56	67	75	76
		500	45	56	61	63	48	59	64	65	49	60	65	66	52	61	67	68	55	64	69	71
		1000	44	62	56	58	46	55	59	60	48	56	60	61	50	48	62	64	53	60	64	66
		2000	43	51	53	55	45	53	55	57	47	55	57	59	49	47	59	61	51	59	61	63
		4000	41	46	50	52	42	49	52	55	45	50	54	57	46	42	56	59	48	54	58	61
		8000	40	45	49	51	41	46	50	52	45	50	54	56	46	41	55	58	48	53	57	59
	Lw(A) [dB(A)]		51	57	61	64	53	60	63	66	55	61	65	68	57	63	67	70	59	65	69	72
p_s = 1000 Pa	Lw [dB/Okt]	f [Hz] 63	59	63	70	74	61	65	72	76	63	67	74	78	65	69	75	80	67	71	78	82
		125	56	62	70	71	58	63	72	75	60	66	74	77	62	68	76	79	64	70	78	81
		250	52	61	68	70	54	62	71	74	57	65	73	76	59	67	75	78	61	69	77	80
		500	51	59	64	69	53	62	68	73	56	63	70	75	58	65	71	76	60	68	73	78
		1000	52	58	63	67	54	60	67	71	58	62	69	72	58	64	70	74	60	66	72	76
		2000	51	57	62	66	53	59	66	69	57	61	68	71	57	63	69	72	59	65	71	74
		4000	49	55	59	63	51	58	62	66	55	59	64	67	56	61	65	68	57	63	66	71
		8000	49	56	58	62	50	57	61	65	54	59	63	67	56	61	65	67	56	63	65	68
	Lw(A) [dB(A)]		56	63	69	75	58	65	73	79	62	69	75	81	63	70	77	83	66	73	79	84

			Ø315				Ø355				Ø400				Ø500				Ø630			
		Vk [m/s]	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12
		Q [m³/h]	843	1692	2543	3394	1073	2160	3252	4347	1364	2736	4111	5488	2111	4255	6412	8577	3365	6804	10273	13759
p_s = 125 Pa	Lw [dB/Okt]	f [Hz] 63	55	64	68	73	57	65	69	74	58	66	70	76	60	68	72	77	62	70	74	80
		125	51	65	66	67	52	66	67	68	53	67	67	69	55	70	70	71	57	72	71	73
		250	48	60	62	65	49	61	63	67	50	62	64	67	51	63	65	68	54	66	67	70
		500	45	55	56	62	46	56	56	62	47	56	58	63	49	58	58	65	51	62	62	66
		1000	43	49	50	56	45	50	51	55	45	51	53	56	47	53	53	60	50	57	55	60
		2000	42	46	46	50	43	46	46	50	44	47	49	51	46	49	50	54	48	52	52	56
		4000	42	44	44	46	42	45	45	47	43	46	46	48	45	47	48	50	47	50	49	52
		8000	40	40	41	41	40	40	42	42	42	42	43	43	42	42	44	44	45	45	45	46
	Lw(A) [dB(A)]		50	54	48	63	49	56	59	62	51	56	62	65	54	60	62	65	56	62	64	68
p_s = 250 Pa	Lw [dB/Okt]	f [Hz] 63	56	64	69	79	62	58	73	83	65	71	76	86	65	71	76	86	67	73	78	88
		125	48	61	66	72	56	59	75	79	56	69	77	80	59	73	78	82	60	74	80	84
		250	42	54	63	63	55	55	71	75	55	67	72	76	58	69	74	78	59	71	76	80
		500	45	53	60	60	51	51	67	69	52	63	69	71	54	64	70	72	56	66	72	74
		1000	46	53	57	57	49	56	61	63	50	58	62	64	52	59	64	66	54	61	66	69
		2000	46	53	55	55	48	54	59	60	49	55	59	60	51	57	61	62	53	59	62	64
		4000	41	47	54	54	47	53	58	58	49	54	57	58	50	56	59	60	52	58	61	62
		8000	44	51	52	55	48	52	56	58	49	54	56	59	49	55	58	60	51	56	60	63
	Lw(A) [dB(A)]		55	64	65	69	58	63	66	70	59	66	68	72	60	66	71	74	63	68	72	76
p_s = 500 Pa	Lw [dB/Okt]	f [Hz] 63	67	71	79	82	68	72	80	83	60	74	82	85	71	75	83	86	73	77	85	88
		125	59	72	80	82	60	73	81	83	61	74	82	84	63	76	84	86	65	78	86	88
		250	57	69	76	78	59	70	78	78	60	70	79	80	62	73	81	82	63	74	82	83
		500	55	66	70	73	57	68	72	74	58	67	73	75	60	70	75	77	61	72	77	78
		1000	54	62	66	68	56	64	67	69	57	64	68	70	58	66	70	72	60	68	72	74
		2000	53	60	63	65	54	62	64	66	55	63	65	67	57	65	67	69	59	67	69	71
		4000	51	56	60	63	51	59	61	64	52	59	62	65	55	60	64	67	57	62	66	69
		8000	50	55	59	61	51	58	60	62	52	57	61	63	54	59	63	65	56	61	65	67
	Lw(A) [dB(A)]		61	67	71	74	62	69	72	77	63	69	73	77	65	71	75	78	67	73	77	81
p_s = 1000 Pa	Lw [dB/Okt]	f [Hz] 63	69	73	79	83	69	74	81	85	71	75	82	86	73	77	84	88	75	79	86	90
		125	66	72	79	82	66	73	80	84	68	74	81	85	68	76	83	87	72	78	86	89
		250	63	71	77	79	62	72	78	83	65	73	79	84	65	75	81	85	69	77	84	88
		500	62	69	75	78	61	70	75	80	64	71	76	82	65	73	78	83	68	75	80	86
		1000	62	68	73	76	62	69	75	78	64	70	75	79	66	73	77	81	68	74	79	83
		2000	61	67	72	75	61	68	74	77	63	69	75	78	65	71	76	80	67	73	79	82
		4000	59	66	67	72	59	67	69	74	61	59	72	75	63	69	73	77	65	72	74	78
		8000	58	65	66	72	58	66	68	74	60	59	71	75	63	69	73	76	64	71	73	77
	Lw(A) [dB(A)]		68	75	80	86	68	76	82	88	70	77	83	89	72	79	85	91	74	81	87	93

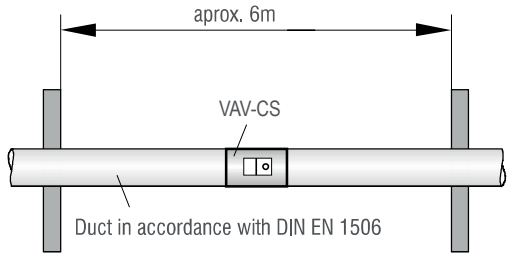
Symbols and specifications

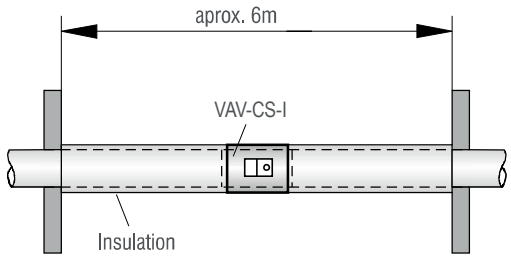
- VAV-CSB = Variable or constant volume damper
- Q = In-Duct air volume in m³/h
- Qmin - Qmax = minimum and maximum set point in m³/h
- Vk = Average velocity in the damper in m/s
- Ps = Pressure drop over the damper according to the position of the blade
- Lw [dB/Okt] = Sound power given at a specific pressure drop Ps for the frequencies f[Hz] from 63 up to 8000 Hz in dB

Selection table			
Type VAV	ØD [mm]	Q_{min} [m³/h]	Q_{max} [m³/h]
VAV-CSB 100	100	37	343
VAV-CSB 125	125	54	540
VAV-CSB 160	160	90	900
VAV-CSB 200	200	145	1459
VAV-CSB 250	250	217	2215
VAV-CSB 315	315	380	3680
VAV-CSB 355	355	482	4275
VAV-CSB 400	400	615	6047
VAV-CSB 500	500	973	9484
VAV-CSB 600	600	1435	12482

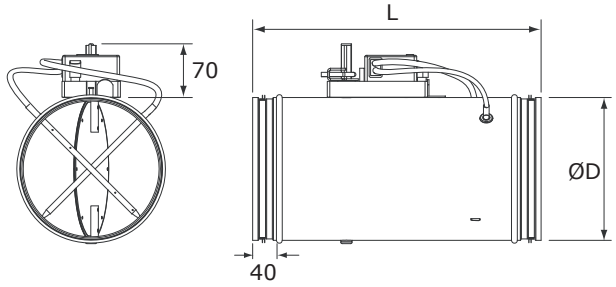
Radiated sound data								
VAV-CSB		ΔLw						
Size		100	125	160	200	250	315	400
f[Hz]	63	31	30	30	29	25	22	20
	125	30	29	29	28	24	22	19
	250	27	25	24	23	20	19	18
	500	21	21	21	22	18	17	17
	1000	19	18	19	21	16	15	15
	2000	11	12	16	18	14	13	12
	4000	11	12	14	16	12	11	10
	8000	9	10	12	13	11	10	10
VAV-CSB-I		ΔLw						
Size		100	125	160	200	250	315	400
f[Hz]	63	33	32	32	31	27	24	22
	125	28	29	32	31	27	25	23
	250	26	24	24	26	23	23	22
	500	26	27	28	33	29	29	29
	1000	34	33	34	39	35	34	35
	2000	33	33	38	44	42	41	39
	4000	37	37	40	43	36	35	33
	8000	31	32	34	35	31	29	29

$$L_{w2} = L_w - \Delta L_w$$



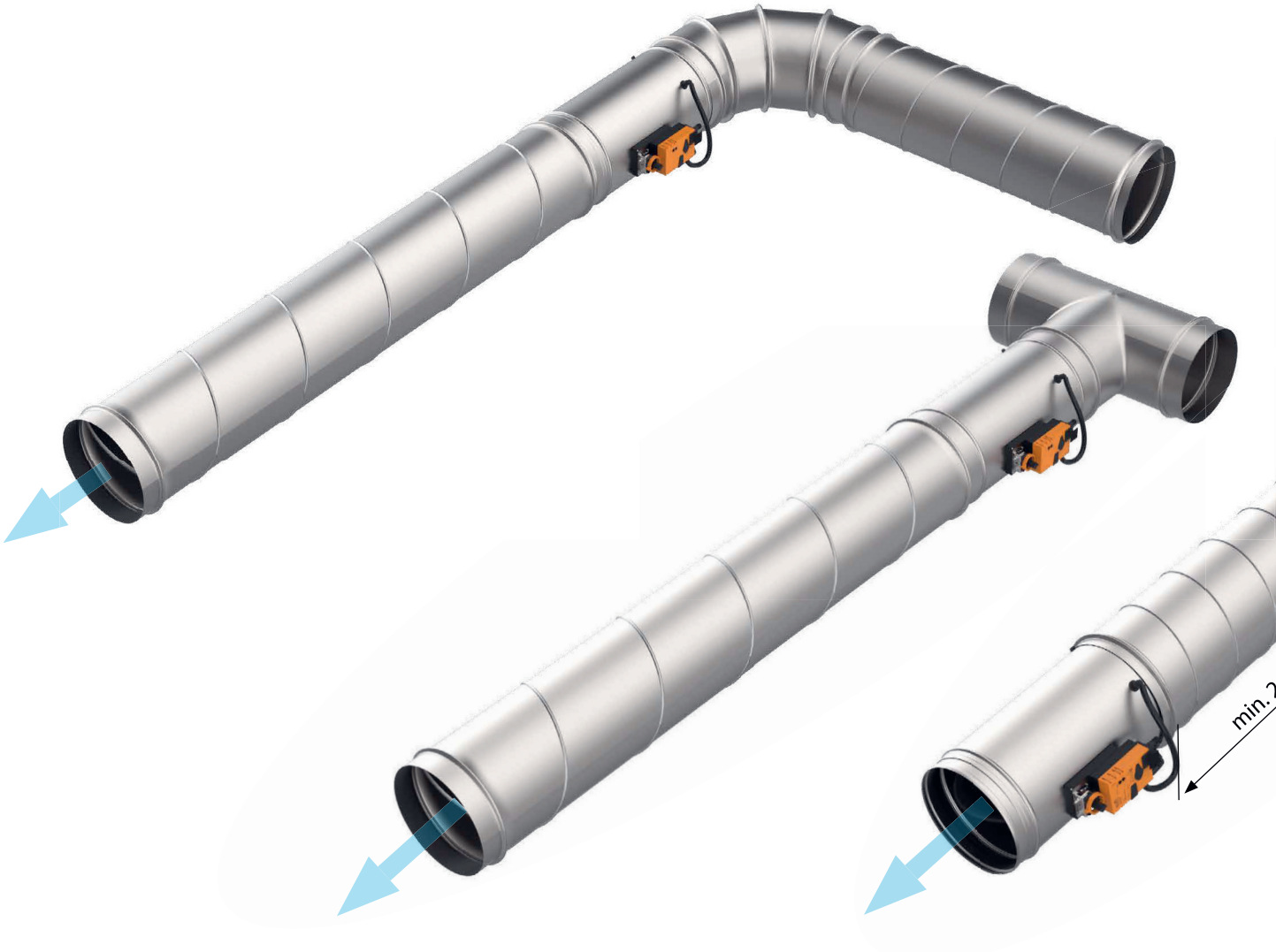


$L_{W2} = L_W - \Delta L_W$
L_{W2} = Case radiated noise in dB
L_W = Sound power given for the frequencies f[Hz] from 63 up to 8000 Hz
ΔL_W = Correction values for case radiated noise in dB



Dimensions		
	ØD [mm]	L [mm]
VAV-CSB 100	98	400
VAV-CSB 125	123	400
VAV-CSB 160	158	400
VAV-CSB 200	198	400
VAV-CSB 250	248	500
VAV-CSB 315	313	600
VAV-CSB 355	353	600
VAV-CSB 400	398	600
VAV-CSB 500	498	750
VAV-CSB 630	628	800

Mounting



Controle modes