

# VRV

## Variable-volume unit

## Rectangular

## Single-walled and double-walled

## LUKA D/ATC 2

### Use

The rectangular variable-volume unit type VRV is suitable as an air-volume unit in low and medium-pressure systems, in supply and return systems.

The unit can be fitted with an electronic control system with a factory set minimum and maximum air volume, and works independently of inlet pressure.

The unit can also be supplied as a constant-volume unit.

These units can be used in balance controls. Please consult our technical experts.

### Characteristics

- Nominal volume range up to 86400 m<sup>3</sup>/h.
- Independent of inlet pressure
- High control accuracy
- Low flow noise.
- Airtightness class LUKA /ATC 2.

### Finish

housing and

damper blades: sendzimir galvanised steel sheet

drive: aluminium gears

bearings: polyamide

### Control equipment

Solid Air uses Belimo as its house brand for combining variable-volume units with intelligent servomotors. For more specific information about adjusting your VAV system, please refer to the appendix [Commissioning variable volume system](#).

If required, other makes can be used. This would be subject to other prices than those included in this catalogue. Information is available on request.

### Available types

#### VRV - S - -

- V** volume control
- R** rectangular version
- V** variable volume

#### - Seal

- R** with rubber seal on damper blades
- L** airtightness class 4 in accordance with EN1751

#### S SDV measuring instrument

#### - Version

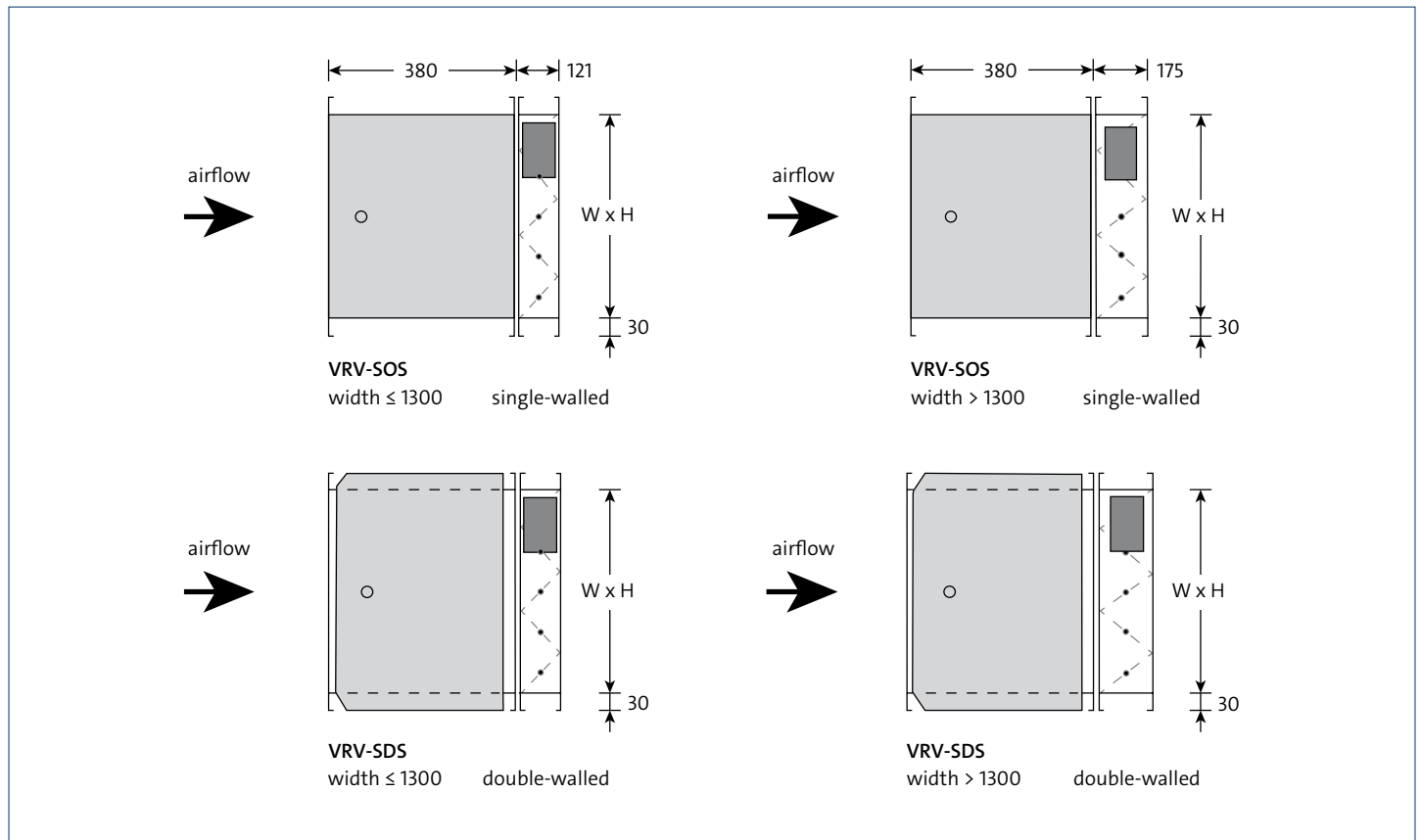
- O** single-walled
- D** double-walled

#### - Belimo control equipment:

- S** compact MP (standard)
- T** compact MOD (also suitable for BACnet MS/TP)
- K** compact KNX
- V** universal VRU (if fast running motor is desired)

For more specific information about the above-mentioned Belimo control equipment, please refer to the annex [VAV actuators](#).

## Dimensions



## Available dimensions

Every duct size to 2000 x 1200 mm (W x H).

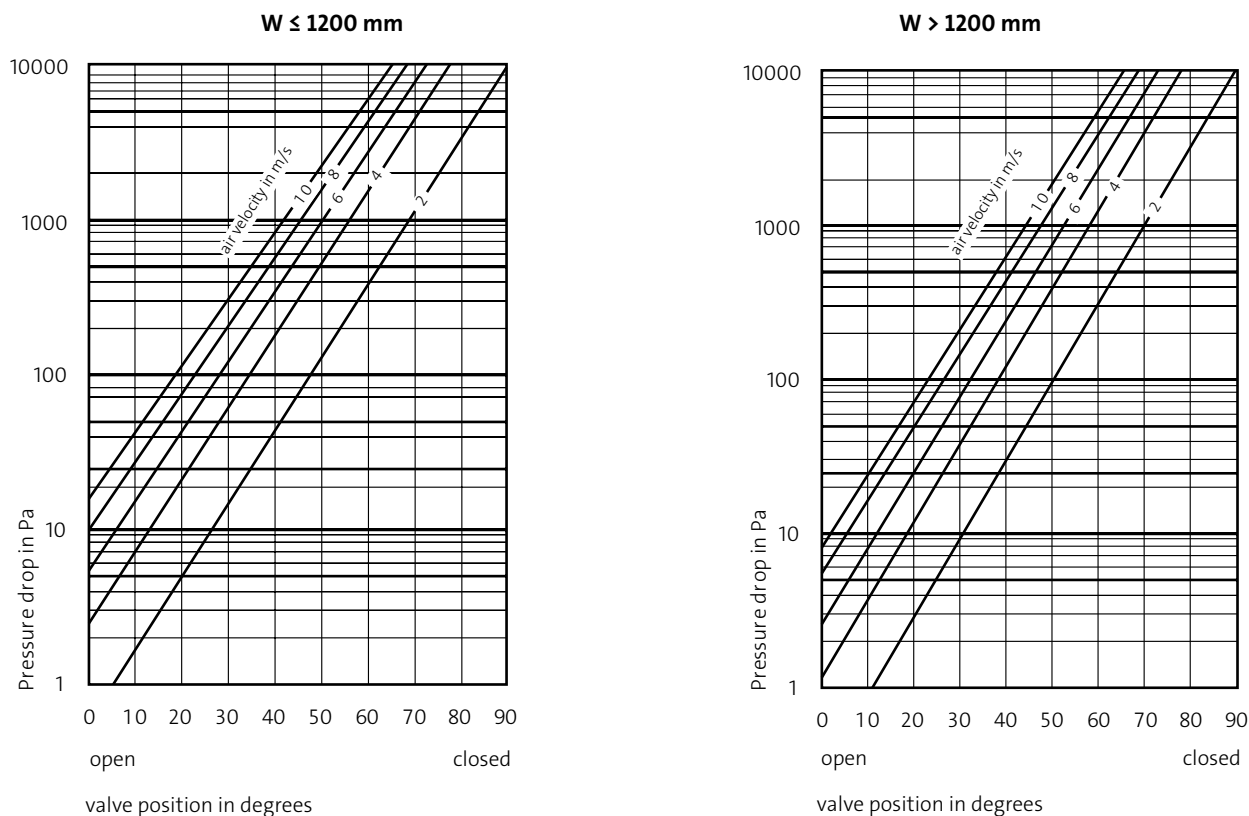
## Comment

- The listed dimensions are in mm.
- Take account of attenuation in case of a high pressure loss.
- VRV version with airtight damper section to 1200 mm with 121 mm profile, larger with 175 profile.
- Dimensions that exceed 1200 x 1200 mm have an airtightness class LUKA C/ATC 3.
- Factory setting of damper blade direction:  
CCW: open  
CW: closed

## Fitting

Variable-volume units type VRV are insensitive to the fitting position. However, the disruption of the flow due to bends and branches must be taken into account. Two to three times the straight flow of the diameter before the unit is recommended. The duct dimension corresponds to the connection size of the unit.

## Selection details



## Minimum air volume at 2 m/s (m<sup>3</sup>/h)

H	W												
	200	300	400	500	600	700	800	1000	1200	1400	1600	1800	2000
200	288	432	576	720	864	1008	1152	1440	1728	2016	2304	2592	2880
300	432	648	864	1080	1296	1512	1728	2160	2592	3024	3456	3888	4320
400	576	864	1152	1440	1728	2016	2304	2880	3456	4032	4608	5184	5760
500	720	1080	1440	1800	2160	2520	2880	3600	4320	5040	5760	6480	7200
600	864	1296	1728	2160	2592	3024	3456	4320	5184	6048	6912	7776	8640
700	1008	1512	2016	2520	3024	3528	4032	5040	6048	7056	8064	9072	10080
800	1152	1728	2304	2880	3456	4032	4608	5760	6912	8064	9216	10368	11520
900	1296	1944	2592	3240	3888	4536	5184	6480	7776	9072	10368	11664	12960
1000	1440	2160	2880	3600	4320	5040	5760	7200	8640	10080	11520	12960	14400
1100	1584	2376	3168	3960	4752	5544	6336	7920	9504	11088	12672	14256	15840
1200	1728	2592	3456	4320	5184	6048	6912	8640	10368	12096	13824	15552	17280

## Maximum air volume at 10 m/s (m<sup>3</sup>/h)

H	W												
	200	300	400	500	600	700	800	1000	1200	1400	1600	1800	2000
200	1440	2160	2880	3600	4320	5040	5760	7200	8640	10080	11520	12960	14400
300	2160	3240	4320	5400	6480	7560	8640	10800	12960	15120	17280	19440	21600
400	2880	4320	5760	7200	8640	10080	11520	14400	17280	20160	23040	25920	28800
500	3600	5400	7200	9000	10800	12600	14400	18000	21600	25200	28800	32400	36000
600	4320	6480	8640	10800	12960	15120	17280	21600	25920	30240	34560	38880	43200
700	5040	7560	10080	12600	15120	17640	20160	25200	30240	35280	40320	45360	50400
800	5760	8640	11520	14400	17280	20160	23040	28800	34560	40320	46080	51840	57600
900	6480	9720	12960	16200	19440	22680	25920	32400	38880	45360	51840	58320	64800
1000	7200	10800	14400	18000	21600	25200	28800	36000	43200	50400	57600	64800	72000
1100	7920	11880	15840	19800	23760	27720	31680	39600	47520	55440	63360	71280	79200
1200	8640	12960	17280	21600	25920	30240	34560	43200	51840	60480	69120	77760	86400

**Air noise VRV: w x h = 1000 x 1000 mm****100 Pa Pressure loss**

v m/s	L <sub>w</sub> in dB/octave band								L <sub>wa</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
2	57	57	59	61	62	61	56	46	67
4	65	63	62	61	60	57	53	47	65
6	70	67	65	64	63	62	59	54	68
8	73	70	68	67	66	65	62	58	72
10	83	81	79	77	74	70	64	56	79

**200 Pa Pressure loss**

v m/s	L <sub>w</sub> in dB/octave band								L <sub>wa</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
2	63	64	66	68	69	67	62	53	73
4	72	70	69	68	66	64	60	54	71
6	76	74	72	71	70	68	65	60	75
8	80	77	75	73	73	71	69	65	78
10	83	79	77	75	74	73	71	68	80

**400 Pa Pressure loss**

v m/s	L <sub>w</sub> in dB/octave band								L <sub>wa</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
2	70	70	72	74	75	74	69	60	80
4	77	75	75	77	79	80	79	74	86
6	83	80	79	78	77	75	72	67	82
8	87	83	81	80	79	78	75	71	85
10	90	86	83	82	81	80	78	74	87

**Radiation noise VRV: w x h = 1000 x 1000 mm****100 Pa Pressure loss**

v m/s	L <sub>w</sub> in dB/octave band								L <sub>wa</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
2	54	53	51	50	46	40	30	15	51
4	62	59	54	50	44	36	27	16	51
6	67	63	57	53	47	41	33	23	55
8	70	66	60	56	50	44	36	27	58
10	80	77	71	66	58	49	38	25	68

**200 Pa Pressure loss**

v m/s	L <sub>w</sub> in dB/octave band								L <sub>wa</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
2	60	60	58	57	53	46	36	22	58
4	69	66	61	57	50	43	34	23	58
6	73	70	64	60	54	47	39	29	62
8	77	73	67	62	57	50	43	34	64
10	80	75	69	64	58	52	45	37	66

**400 Pa Pressure loss**

v m/s	L <sub>w</sub> in dB/octave band								L <sub>wa</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
2	67	66	64	63	59	53	43	29	64
4	74	71	67	66	63	59	53	43	68
6	80	76	71	67	61	54	46	36	68
8	84	79	73	69	63	57	49	40	71
10	87	82	75	71	65	59	52	43	73

**Noise data**

- The radiation noise of the double-walled version is approximately 5 dB lower than the above table values.

## Correction table alternative dimensions

### Air noise

H	W												
	200	300	400	500	600	700	800	1000	1200	1400	1600	1800	2000
200	-14	-12	-11	-10	-9	-9	-8	-7	-6	-6	-5	-4	-4
300	-12	-10	-9	-8	-7	-7	-6	-5	-4	-4	-3	-3	-2
400	-11	-9	-8	-7	-6	-6	-5	-4	-3	-3	-2	-1	-1
500	-10	-8	-7	-6	-5	-5	-4	-3	-2	-2	-1	0	0
600	-9	-7	-6	-5	-4	-4	-3	-2	-1	-1	0	0	1
700	-9	-7	-6	-5	-4	-3	-3	-2	-1	0	0	1	1
800	-8	-6	-5	-4	-3	-3	-2	-1	0	0	1	2	2
1000	-7	-5	-4	-3	-2	-2	-1	0	1	1	2	3	3
1200	-6	-4	-3	-2	-1	-1	0	1	2	2	3	3	4

### Radiation noise

H	W												
	200	300	400	500	600	700	800	1000	1200	1400	1600	1800	2000
200	-7	-6	-5	-5	-4	-3	-3	-2	-2	-1	0	0	0
300	-6	-5	-5	-4	-3	-3	-3	-2	-1	-1	0	0	1
400	-5	-5	-4	-3	-3	-3	-2	-2	-1	0	0	0	1
500	-5	-4	-3	-3	-3	-2	-2	-1	-1	0	0	1	1
600	-4	-3	-3	-3	-2	-2	-2	-1	0	0	0	1	1
700	-3	-3	-3	-2	-2	-2	-1	-1	0	0	1	1	1
800	-3	-3	-2	-2	-2	-1	-1	0	0	0	1	1	1
1000	-2	-2	-2	-1	-1	-1	0	0	0	1	1	1	2
1200	-2	-1	-1	-1	0	0	0	0	1	1	1	2	2

## Selection example

### Situation

Air volume 3900 m<sup>3</sup>/h.  
 Duct size 600 x 300 mm.  
 Max. pressure difference over the unit approx. 200 Pa.

### Solution

Calculate supply speed  $v = \text{approx. } 6 \text{ m/s.}$

Read  $L_w$  in table

- Air noise (200 Pa)  $L_{wa} = 75 \text{ dB(A).}$
- Radiation noise (200 Pa)  $L_{wa} = 62 \text{ dB(A).}$

Read the correction values in the correction table and correct the previously calculated  $L_{wa}$  value:

- Air noise  $75 - 7 = 68 \text{ dB(A).}$
- Radiation noise  $62 - 3 = 59 \text{ dB(A).}$

The octave-band data need to be corrected in the same way.