



# Lindab **VRA**

Volume flow regulator - rectangular



# Volume flow regulator

# VRA



## Description - Compact

VRA is a rectangular VAV unit with combined regulating damper and airflow measurement in one unit, used for pressure independent volume air flow rate regulation.

VRA Compact is available with actuators for different communication platforms; Belimo MP, Modbus/BACnet or KNX. (For VRA Universal see details on next page).

To avoid clogging of the measuring cross, it is recommended to use VRA only in applications with clean air, meaning free of dust, particles and similar.

- Pressure independent VAV regulation.
- Belimo MP, Modbus/BACnet or KNX.
- Integrated NFC interface, compatible with Belimo Assistant App (only MP).
- Tightness class ATC4 (formerly Class B) according to EN1751.

## Order code

<b>Product</b>	<b>VRA</b>	<b>aaa x bbb</b>	<b>ccc</b>	<b>dddd</b>
<b>Type</b>	VRA			
<b>Dimension</b>	Min. : a x b = 200 x 100 mm Max. : a + b ≤ 2400 mm and a ≤ 1500 mm			
<b>Motor type</b>	MP, KNX, MOD			
<b>Flange type</b>	LS RJFP 20 (Standard All sizes) RJFP 30 When a or b > 800 RJFP 40 On request			

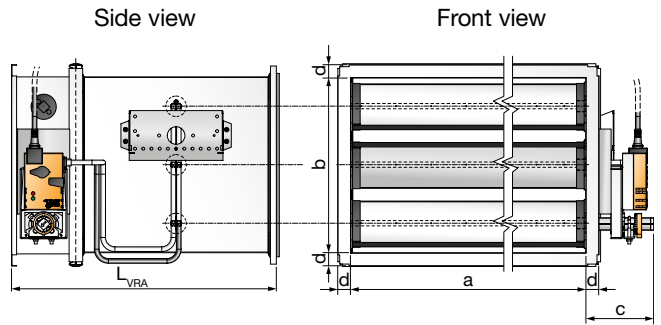
Example: VRA-500x200-MP-RJFP 20

## Factory settings

	Standard
Min. Air flow	0
Max. Air flow	V <sub>nom</sub> (7 m/s)
Control signal	2 - 10 V
Feedback signal	Damper position *

\* Valid for MP.

## Dimensions



**NB!** Different flange types are available, see order code and dimension table below.

## Dimension table

Flange type	d mm	L <sub>VRA</sub> mm
LS	20	453
RJFP20	20	493
RJFP30	30	513
RJFP40	40	535

## Motor type table

Type	Motor	c mm
MP	NMV-D3-MP	115
KNX	NMV-D3-KNX	115
MOD	NMV-D3-MOD	115

## Tightness class

Blade area m <sup>2</sup>	Tightness class
up to 0.6	2
From 0.6	3

Tightness for damper blades according to norm EN 1751, (leakage through closed blades).

## Installation

VRA is prepared for insulation with 50 mm thick insulation material. VRA can only be installed with damper blades in a horizontal position.

Using LS-profile. Installation instruction, please go to Assembly instruction, Rectangular air duct systems, [LS-profile](#).

Using RJFP-profiles. Installation instruction, please go to Lindab rectangular duct systems, [RJFP-profile](#).

You can find general information about air duct systems, theory and calculations following this [link](#).

## Belimo documentation

For Belimo motor documentation, visit and read more on Belimo's homepage:

Type	Documentation
MP / MOD /KNX	<a href="#">Belimo Compact</a>

# Volume flow regulator

# VRA



## Description - Universal range

VRA is a rectangular VAV unit with combined regulating damper and airflow measurement in one unit, used for pressure independent volume air flow rate regulation. VRA Universal is equipped with regulator and rotary actuator. Regulators comes with either flow sensor (D3) for clean air or membrane sensor (M1) for contaminated air. Actuators are available as standard universal (UNI), spring-return (SPR) or fast-running version (FAS). (For VRA Compact see details on previous page). To avoid clogging of the measuring cross, it is recommended to use VRA only in applications with clean air, meaning free of dust, particles and similar.

- Pressure independent VAV regulation.
- Belimo MP, Modbus, BACnet & analogue control 0(2)-10V.
- Integrated NFC interface, compliable with Belimo Assistant App.
- Tightness class ATC4 (formerly Class B) according to EN1751.

## Order code

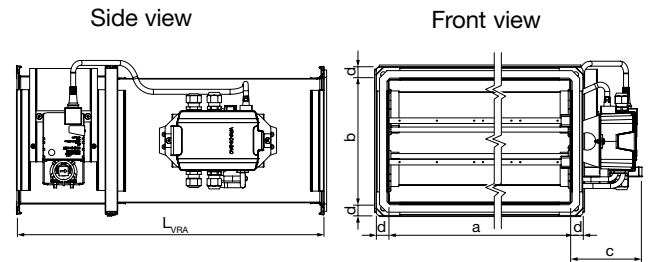
<b>Product</b>	<b>VRA</b>	<b>aaa x bbb</b>	<b>ccc</b>	<b>ddd</b>	<b>eeee</b>
<b>Type</b>	VRA				
<b>Dimension</b>	Min. : a x b = 300 x 100 mm Max. : a + b ≤ 2400 mm and a ≤ 1500 mm				
<b>Motor type</b>	UNI Universal rotary actuator SPR Spring return actuator FAS Fast running actuator				
<b>Regulator</b>	D D3 dynamic flow sensor M M1 membrane sensor				
<b>Flange type</b>	LS RJFP 20 (Standard All sizes ) RJFP 30 When a or b > 800 RJFP 40 On request				

Example: VRA-500x200-UNI-D-RJFP 20

## Factory settings

	Standard
Min. Air flow	0
Max. Air flow	$V_{nom}$ (7 m/s)
Control signal	2 - 10 V
Feedback signal	Flow

## Dimensions



**NB!** Different flange types are available, see order code and dimension table below.

## Dimension table

Flange type	d mm	L mm	c mm
LS	20	453	115
RJFP20	20	493	115
RJFP30	30	513	115
RJFP40	40	535	115

## Motor type table

Type	Regulator	Motor
UNI	VRU-D3-BAC	NM24A-VST
UNI-M	VRU-M1-BAC	NM24A-VST
SPR	VRU-D3-BAC	NF24A-VST
SPR-M	VRU-M1-BAC	NF24A-VST
FAS	VRU-D3-BAC	NMQ-24A-VST
FAS-M	VRU-M1-BAC	NMQ-24A-VST

Tightness class: As VRA Compact (see page 2).  
Installation: As VRA Compact (see page 2).

## Belimo documentation

For Belimo motor documentation, visit and read more on Belimo's homepage:

Type	Documentation
All	<a href="#">Belimo Universal</a>

# Volume flow regulator

# VRA

## Technical data

### Volume flow measurement

The accuracy of volume flow measurement depends on the flow conditions in front of the measuring cross. It is preferable to have a long straight duct section in front of the measuring point, according to the table below.

If these recommendations are not followed, it will cause an unstable flow measurement and therefore higher inaccuracy in the regulation of the required air flow.

The accuracy of volume flow measurement also depends on whether the holes in the measuring cross are free of dust.

The dust content in the individual application will determine the cleaning interval.

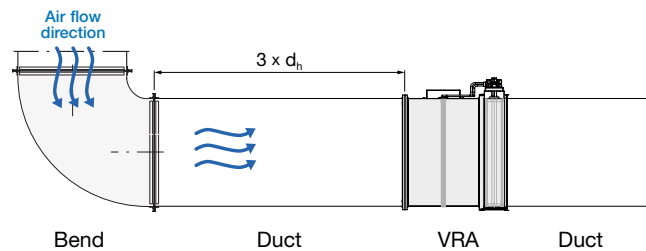
For cleaning the measuring cross, see [installation instruction](#).

Components	Recommended straight duct before unit
Bend	3 x d <sub>h</sub> <sup>*</sup>
Tee-piece	4 x d <sub>h</sub> <sup>*</sup>
Damper	6 x d <sub>h</sub> <sup>*</sup>
Rectangular attenuator (Extract)	1 x d <sub>h</sub> <sup>*</sup> (min. 500 mm)

d<sub>h</sub><sup>\*</sup> is the hydraulic diameter for a rectangular duct (and VRA),  
d<sub>h</sub> can be calculated by using VRA dimension a and b:

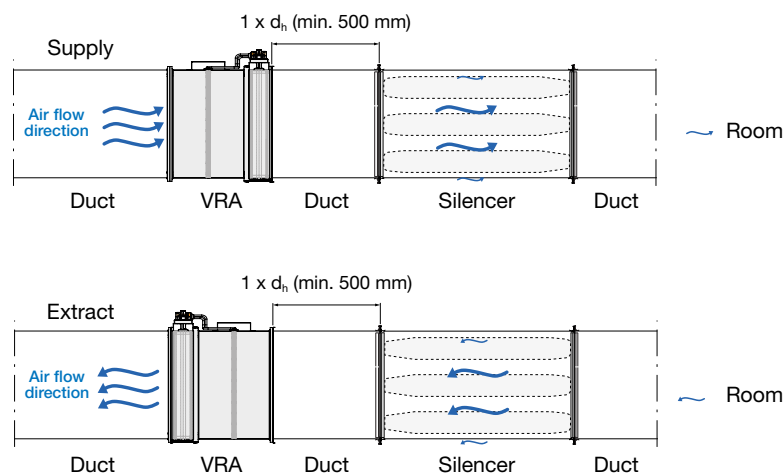
$$d_h^* = 2 \times a \times b / (a + b)$$

### Examples:



Example above showing recommended straight duct distance between VRA and duct bend.

Minimum recommended distance between VRA and a rectangular attenuator:



Example above showing recommended straight duct distance between VRA and rectangular attenuator. (For supply air and extract air).

**NB!** Distance must as a minimum be ≥ 500 mm .

# Volume flow regulator

# VRA

## Technical data

### Settings

$V_{nom}$  indicates the measuring range for the actuator. A standard VRA is calibrated to a  $V_{nom}$  of 7 m/s according to the table below.

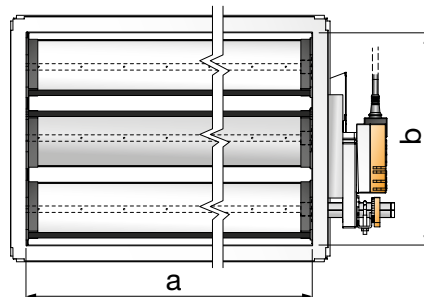
In special cases the VRA can be set to a higher  $V_{nom}$ , e.g. 10 m/s.

For VRA,  $V_{max}$  and  $V_{min}$  indicate the limits for the actuators working range.

There is linearity between  $V_{min}$  to  $V_{max}$  and the input signal.  $V_{max}$  can be set in the range 20-100% of  $V_{nom}$ ,  $V_{min}$  in the range of 0 - 100% of  $V_{nom}$  ( $< V_{max}$ ); however, air velocities below 1 m/s corresponds to a measuring pressure of less than 1 Pa, which makes the flow regulation less accurate.

### VRA nominal air flow ( $V_{nom}$ ) and measuring limit.

Size mm			Measuring limit = 1 m/s		(Standard) $V_{nom} = 7$ m/s		$V_{nom} = 10$ m/s	
a	x	b	m <sup>3</sup> /h	l/s	m <sup>3</sup> /h	l/s	m <sup>3</sup> /h	l/s
300		200	216	60	1512	420	2160	600
400		200	288	80	2016	560	2880	800
		300	432	120	3024	840	4320	1200
500		200	360	100	2520	700	3600	1000
		300	540	150	3780	1050	5400	1500
		400	720	200	5040	1400	7200	2000
		500	900	250	6300	1750	9000	2500
600		200	432	120	3024	840	4320	1200
		300	648	180	4536	1260	6480	1800
		400	864	240	6048	1680	8640	2400
		500	1080	300	7560	2100	10800	3000
800		200	576	160	4032	1120	5760	1600
		300	864	240	6048	1680	8640	2400
		400	1152	320	8064	2240	11520	3200
		500	1440	400	10080	2800	14400	4000
1000		300	1080	300	7560	2100	10800	3000
		400	1440	400	10080	2800	14400	4000
		500	1800	500	12600	3500	18000	5000
		600	2160	600	15120	4200	21600	6000



Front view of VRA and dimension a and b.

# Volume flow regulator

# VRA

## Technical data

### Sound data

Below sound power levels for ducts (flow noise) with reference to ISO 5135 as a function of air flow and pressure difference.

Dim. a x b mm	Pressure drop Pa	Velocity app. 1 m/s								Velocity app. 3 m/s								Velocity app. 6 m/s										
		Centre frequency Hz								L <sub>WA</sub> dB(A)	Centre frequency Hz								L <sub>WA</sub> dB(A)	Centre frequency Hz								L <sub>WA</sub> dB(A)
		63	125	250	500	1k	2k	4k	8k		63	125	250	500	1k	2k	4k	8k		63	125	250	500	1k	2k	4k	8k	
300 x 200	500	Flow 60 l/s / 216 m³/h								57	Flow 180 l/s / 648 m³/h								63	Flow 360 l/s / 1296 m³/h								66
	200	57	57	54	53	52	49	47	44		63	63	60	59	58	55	53	50		66	66	63	62	61	58	56	53	
	100	53	53	50	49	48	45	43	40		58	58	55	54	53	50	48	45		62	62	59	58	57	54	52	49	
	50	49	49	46	45	44	41	39	36		54	54	51	50	49	46	44	41		59	59	56	55	54	51	49	46	
	20	45	45	42	41	40	37	35	32		49	49	46	45	44	41	39	36		55	55	52	51	50	47	45	42	
400 x 200	500	Flow 80 l/s / 288 m³/h								58	Flow 240 l/s / 864 m³/h								64	Flow 480 l/s / 1728 m³/h								67
	200	58	58	55	54	53	50	48	45		64	64	61	60	59	56	54	51		67	67	64	63	62	59	57	54	
	100	54	54	51	50	49	46	44	41		59	59	56	55	54	51	49	46		63	63	60	59	58	55	53	50	
	50	50	50	47	46	45	42	40	37		55	55	52	51	50	47	45	42		60	60	57	56	55	52	50	47	
	20	46	46	43	42	41	38	36	33		50	50	47	46	45	42	40	37		56	56	53	52	51	48	46	43	
400 x 300	500	Flow 120 l/s / 432 m³/h								60	Flow 360 l/s / 1296 m³/h								66	Flow 720 l/s / 2592 m³/h								69
	200	60	60	57	56	55	52	50	47		66	66	63	62	61	58	56	53		69	69	66	65	64	61	59	56	
	100	56	56	53	52	51	48	46	43		61	61	58	57	56	53	51	48		65	65	62	61	60	57	55	52	
	50	52	52	49	48	47	44	42	39		57	57	54	53	52	49	47	44		62	62	59	58	57	54	52	49	
	20	48	48	45	44	43	40	38	35		52	52	49	48	47	44	42	39		58	58	55	54	53	50	48	45	
500 x 200	500	Flow 100 l/s / 360 m³/h								59	Flow 300 l/s / 1080 m³/h								65	Flow 600 l/s / 2160 m³/h								68
	200	59	59	56	55	54	51	49	46		65	65	62	61	60	57	55	52		68	68	65	64	63	60	58	55	
	100	55	55	52	51	50	47	45	42		60	60	57	56	55	52	50	47		64	64	61	60	59	56	54	51	
	50	51	51	48	47	46	43	41	38		56	56	53	52	51	48	46	43		61	61	58	57	56	53	51	48	
	20	47	47	44	43	42	39	37	34		51	51	48	47	46	43	41	38		57	57	54	53	52	49	47	44	
500 x 300	500	Flow 150 l/s / 540 m³/h								61	Flow 450 l/s / 1620 m³/h								67	Flow 900 l/s / 3240 m³/h								70
	200	61	61	58	57	56	53	51	48		67	67	64	63	62	59	57	54		70	70	67	66	65	62	60	57	
	100	57	57	54	53	52	49	47	44		62	62	59	58	57	54	52	49		66	66	63	62	61	58	56	53	
	50	53	53	50	49	48	45	43	40		58	58	55	54	53	50	48	45		63	63	60	59	58	55	53	50	
	20	49	49	46	45	44	41	39	36		53	53	50	49	48	45	43	40		59	59	56	55	54	51	49	46	
500 x 400	500	Flow 200 l/s / 720 m³/h								62	Flow 600 l/s / 2160 m³/h								68	Flow 1200 l/s / 4320 m³/h								71
	200	62	62	59	58	57	54	52	49		68	68	65	64	63	60	58	55		71	71	68	67	66	63	61	58	
	100	58	58	55	54	53	50	48	45		63	63	60	59	58	55	53	50		67	67	64	63	62	59	57	54	
	50	54	54	51	50	49	46	44	41		59	59	56	55	54	51	49	46		64	64	61	60	59	56	54	51	
	20	50	50	47	46	45	42	40	37		54	54	51	50	49	46	44	41		60	60	57	56	55	52	50	47	
500 x 500	500	Flow 250 l/s / 900 m³/h								63	Flow 750 l/s / 2700 m³/h								69	Flow 1500 l/s / 5400 m³/h								72
	200	63	63	60	59	58	55	53	50		69	69	66	65	64	61	59	56		72	72	69	68	67	64	62	59	
	100	59	59	56	55	54	51	49	46		64	64	61	60	59	56	54	51		68	68	65	64	63	60	58	55	
	50	55	55	52	51	50	47	45	42		60	60	57	56	55	52	50	47		65	65	62	61	60	57	55	52	
	20	51	51	48	47	46	43	41	38		55	55	52	51	50	47	45	42		61	61	58	57	56	53	51	48	
600 x 200	500	Flow 120 l/s / 432 m³/h								60	Flow 360 l/s / 1296 m³/h								66	Flow 720 l/s / 2592 m³/h								69
	200	60	60	57	56	55	52	50	47		66	66	63	62	61	58	56	53		69	69	66	65	64	61	59	56	
	100	56	56	53	52	51	48	46	43		61	61	58	57	56	53	51	48		65	65	62	61	60	57	55	52	
	50	52	52	49	48	47	44	42	39		57	57	54	53	52	49	47	44		62	62	59	58	57	54	52	49	
	20	48	48	45	44	43	40	38	35		52	52	49	48	47	44	42	39		58	58	55	54	53	50	48	45	
600 x 300	500	Flow 180 l/s / 648 m³/h								61	Flow 540 l/s / 1944 m³/h								67	Flow 1080 l/s / 3888 m³/h								70
	200	61	61	58	57	56	53	51	48		67	67	64	63	62	59	57	54		70	70	67	66	65	62	60	57	
	100	57	57	54	53	52	49	47	44		62	62	59	58	57	54	52	49		66	66	63	62	61	58	56	53	
	50	53	53	50	49	48	45	43	40		59	59	56	55	54	51	49	46		64	64	61	60	59	56	54	51	
	20	49	49	46	45	44	41	39	36		54	54	51	50	49	46	44	41		60	60	57	56	55	52	50	47	
600 x 400	500	Flow 240 l/s / 864 m³/h								63	Flow 720 l/s / 2592 m³/h								69	Flow 1440 l/s / 5184 m³/h								72
	200	63	63	60	59	58	55	53	50		69	69	66	65	64	61	59	56		72	72	69	68	67	64	62	59	
	100	59	59	56	55	54	51	49	46		64	64	61	60	59	56	54	51		68	68	65	64	63	60	58	55	
	50	55	55	52	51	50	47	45	42		60	60	57	56	55	52	50	47		65	65	62	61	60	57	55	52	
	20	51	51	48	47	46	43	41	38		55	55	52	51	50	47	45	42		61	61	58	57	56	53	51	48	
600 x 500	500	Flow 300 l/s / 1080 m³/h								64	Flow 900 l/s / 3240 m³/h								70	Flow 1800 l/s / 6480 m³/h								73
	200	64	64	61	60	59	56	54	51		70	70	67	66	65	62	60	57		73	73	70	69	68	65	63	60	
	100	60	60	57	56	55	52	50	47		65	65	62	61	60	57	55	52		69	69	66	65	64	61	59	56	
	50	56	56	53	52	51	48	46	43		61	61	58	57	56	53	51	48		66	66	63	62	61	58	56	53	
	20	52	52	49	48	47	44	42	39		56	56	53	52	51	48	46	43		62	62	59	58	57	54	52	49	

# Volume flow regulator

# VRA

## Technical data

### Sound data

Below sound power levels for ducts (flow noise) with reference to ISO 5135 as a function of air flow and pressure difference.

Dim. a x b mm	Pressure drop Pa	Velocity app. 1 m/s								Velocity app. 3 m/s								Velocity app. 6 m/s										
		Centre frequency Hz								L <sub>WA</sub> dB(A)	Centre frequency Hz								L <sub>WA</sub> dB(A)	Centre frequency Hz								L <sub>WA</sub> dB(A)
		63	125	250	500	1k	2k	4k	8k		63	125	250	500	1k	2k	4k	8k		63	125	250	500	1k	2k	4k	8k	
1000 x 300		Flow 300 l/s / 1080 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 900 l/s / 3240 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 1800 l/s / 6480 m <sup>3</sup> /h								L <sub>WA</sub>
	500	64	64	61	60	59	56	54	51	64	70	70	67	66	65	62	60	57	70	73	73	70	69	68	65	63	60	73
	200	60	60	57	56	55	52	50	47	60	65	65	62	61	60	57	55	52	65	69	69	66	65	64	61	59	56	69
	100	56	56	53	52	51	48	46	43	56	61	61	58	57	56	53	51	48	61	66	66	63	62	61	58	56	53	66
	50	52	52	49	48	47	44	42	39	52	56	56	53	52	51	48	46	43	56	62	62	59	58	57	54	52	49	62
20	47	47	44	43	42	39	37	34	47	50	50	47	46	45	42	40	37	50	55	55	52	51	50	47	45	42	55	
1000 x 400		Flow 400 l/s / 1440 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 1200 l/s / 4320 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 2400 l/s / 6840 m <sup>3</sup> /h								L <sub>WA</sub>
	500	65	65	62	61	60	57	55	52	65	71	71	68	67	66	63	61	58	71	74	74	71	70	69	66	64	61	74
	200	61	61	58	57	56	53	51	48	61	66	66	63	62	61	58	56	53	66	70	70	67	66	65	62	60	57	70
	100	57	57	54	53	52	49	47	44	57	62	62	59	58	57	54	52	49	62	67	67	64	63	62	59	57	54	67
	50	53	53	50	49	48	45	43	40	53	57	57	54	53	52	49	47	44	57	63	63	60	59	58	55	53	50	63
20	48	48	45	44	43	40	38	35	48	51	51	48	47	46	43	41	38	51	56	56	53	52	51	48	46	43	56	
1000 x 500		Flow 500 l/s / 1800 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 1500 l/s / 5400 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 3000 l/s / 10800 m <sup>3</sup> /h								L <sub>WA</sub>
	500	66	66	63	62	61	58	56	53	66	72	72	69	68	67	64	62	59	72	75	75	72	71	70	67	65	62	75
	200	62	62	59	58	57	54	52	49	62	67	67	64	63	62	59	57	54	67	71	71	68	67	66	63	61	58	71
	100	58	58	55	54	53	50	48	45	58	63	63	60	59	58	55	53	50	63	68	68	65	64	63	60	58	55	68
	50	54	54	51	50	49	46	44	41	54	58	58	55	54	53	50	48	45	58	64	64	61	60	59	56	54	51	64
20	49	49	46	45	44	41	39	36	49	52	52	49	48	47	44	42	39	52	57	57	54	53	52	49	47	44	57	
1000 x 600		Flow 600 l/s / 2160 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 1800 l/s / 6480 m <sup>3</sup> /h								L <sub>WA</sub>	Flow 3600 l/s / 12960 m <sup>3</sup> /h								L <sub>WA</sub>
	500	67	67	64	63	62	59	57	54	67	73	73	70	69	68	65	63	60	73	76	76	73	72	71	68	66	63	76
	200	63	63	60	59	58	55	53	50	63	68	68	65	64	63	60	58	55	68	72	72	69	68	67	64	62	59	72
	100	59	59	56	55	54	51	49	46	59	64	64	61	60	59	56	54	51	64	69	69	66	65	64	61	59	56	69
	50	55	55	52	51	50	47	45	42	55	59	59	56	55	54	51	49	46	59	65	65	62	61	60	57	55	52	65
20	50	50	47	46	45	42	40	37	50	53	53	50	49	48	45	43	40	53	58	58	55	54	53	50	48	45	58	

# Volume flow regulator

VRA

## Belimo information

Find all information and download here: [Belimo](#)

### Key features:

- Check and modify device setting parameters
- Display identification data: Device type, position, designation, serial number, bus address
- Addressing (MP-Bus, BACnet, Modbus, TCP/IP)
- "Setup": Guided parameter setup for your device
- "Copy/Paste Configuration": Replicate settings for the same device types
- "Live trend": Perform local override and live trending with the easyshare function
- "Health": Monitor device operation KPIs. E.g. Power supply, Bus state, Sensor state, etc.
- "Reports": Retrieve digital reports of your device with the easy-share function. E.g. Calibration certificate, Commissioning report
- "Export Configuration": Create a logfile with the easy-share function -
- In-app language adjustment (EN/DE/FR/IT/ES/CN/RU)
- Platform-independent for Android, Apple iOS, and Windows



Smartphone/ Tablet



PC



- 1) LINK.10 is needed for Bluetooth and USB connection. It is recommended for more extended use and working with devices with a higher information density.
- 2) ZIP-BT-NFC is also possible.
- 3) ZTH EU/US/AP is also possible

Download and install


- [Link.10](#) - (Supports Bluetooth and USB to NFC and MP-Bus)
- [ZK1-GEN](#) (Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: 6-pin for connection to service socket)
- [ZK2-GEN](#) (Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal)



Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

[Lindab](#) | For a better climate