

Lindab **PRJ**

Pressure control damper - rectangular



Pressure control damper

PRJ



Description

PRJ is a pressure control damper used for regulating static pressure in rectangular duct systems.

PRJ is equipped with pressure regulator, rotary actuator and with 2 m hose and measuring probe (not included in MR version for room pressure control).

Pressure regulators comes with either flow sensor (D3) for clean air or membrane sensor (M1) for contaminated air. Furthermore the membrane sensor comes in a version specifically for room pressure control (M1R).

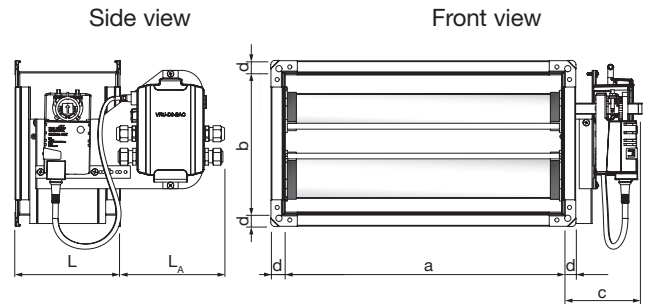
Actuators are available as standard universal (UNI), spring-return (SPR) or fast-running version (FAS).

- Belimo MP, Modbus, BACnet & analogue control 0(2)-10V.
- Integrated NFC interface, compatible with Belimo Assistant App.
- Tightness class ATC 3 according to EN1751 (formerly class B).

Order code

Product	PRJ	aaa x bbb	bbb	ccc	ddd	eee
Type	PRJ					
Dimension						
Min.: a x b = 200 x 100						
Max.: a + b ≤ 2400 mm.						
and a ≤ 1500 mm.						
Motor type						
UNI Universal rotary actuator						
SPR Spring return actuator						
FAS Fast running actuator (Only MR regulator)						
Regulator						
D D3 dynamic flow sensor						
M M1 membrane sensor						
MR M1R membrane sensor for room						
Pressure range						
100, 200, 300, 500 pa (duct pressure type D + M)						
25 pa (room pressure type MR)						
Flange type						
LS						
RJFP20 Standard all sizes						
RJFP30 When a or b > 800 mm						
RJFP40 on request						
Example: PRJ - 500 - 200 - UNI - D - 100 - RJFP20						

Dimensions



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

Dimension table

Flange type	d mm	L mm	L _A mm	c mm
LS	20	151	147	115
RJFP20	20	151	147	115
RJFP30	30	151	147	115
RJFP40	40	151	147	115

Motor type table

Type	Regulator	Motor
UNI	VRU-D3-BAC	NM24A-VST
UNI-M	VRU-M1-BAC	NM24A-VST
UNI-MR*	VRU-M1R-BAC	NM24A-VST
SPR	VRU-D3-BAC	NF24A-VST
SPR-M	VRU-M1-BAC	NF24A-VST
SPR-MR*	VRU-M1R-BAC	NF24A-VST
FAS-MR*	VRU-M1R-BAC	NMQ24A-VST

*) Used without pressure measuring hose.

Belimo documentation

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

Type	Documentation
All	Belimo Universal

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Tightness class

Blade area m ²	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

PRJ is prepared for 50 mm insulation.

PRJ can only be installed with damper slats 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](#).

Volume flow regulator

PRJ

Technical data

Duct pressure control range configurations

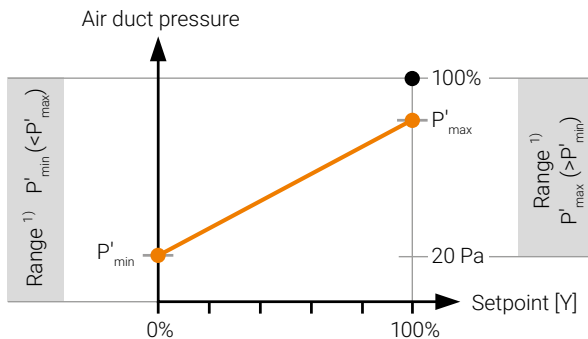
The setup is independent of sizes, but there are four different pressure range configurations (P_{nom}) to achieve different dead bands.

P_{nom}	Controller dead band	Lower regulation limit (from v.1.04-0001)	Lower regulation limit older versions
100 Pa	+/- 1 Pa	20 Pa	32 Pa
200 Pa	+/- 2 Pa	20 Pa	35 Pa
300 Pa	+/- 3 Pa	20 Pa	38 Pa
500 Pa	+/- 5 Pa	20 Pa	38 Pa

- From Lindab factory P_{max} is set equal to P_{nom} .
- P_{min} is set to 50 Pa for all configurations. If not providing a control signal, the pressure will then be controlled to 50 Pa.
- The controller dead band is from Lindab factory set for the most accurate possible regulation (+/- 1%).
- The controller sensitivity (regulation speed) is set to medium (5).
- In unstable systems, the controller settings can cause the motor to adjust excessively trying to keep the setpoint. Changing the controller dead band and controller sensitivity setting requires Belimo PC Tool.

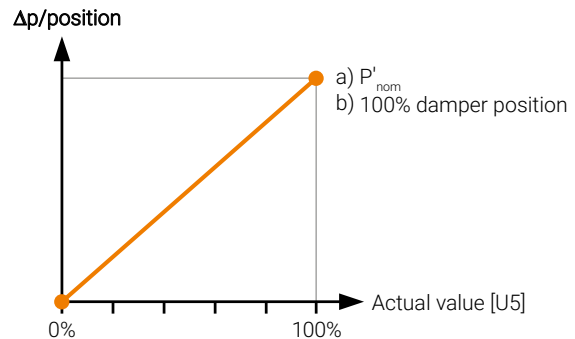
Function diagram

Δp control: Y/bus (setpoint)



¹⁾Note: from firmware V 1.04-0001: 20 Pa
older firmware versions: 38 Pa

Feedback U5/bus (actual value)



Control functions

- P_{min}^1 Pressure level 1
- P_{max}^1 Pressure level 2
- $P_{min}^1 \dots P_{max}^1$ Variable operation (STP)
- Local override (z1/z2)
 - Motor stop, damper OPEN,
 - P_{max}^1 damper closed
- Control analogue 0... 10 V/2... 10 V, Modbus ¹⁾, BACnet ¹⁾, MP-Bus

¹⁾Hybrid mode possible

Limitations for PRJ regulator type D (Belimo VRU-D3-BAC)

- The Belimo VRU-D3-BAC can only be used for clean air / comfort application
- Max pressure hose length for PRJ with Belimo VRU-D3-BAC is 20 m. If longer hose is needed, then use PRJ with Belimo VRU-M1-BAC.

Volume flow regulator

PRJ

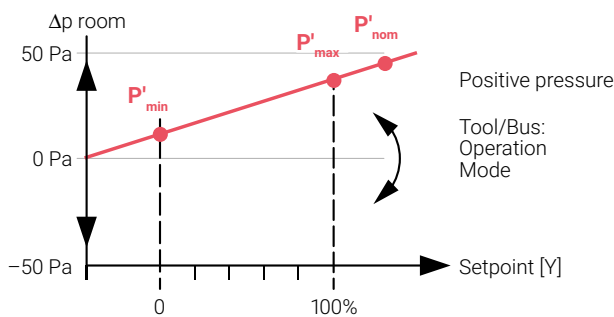
Room pressure control configuration

The PRJ room pressure control is independent of sizes.

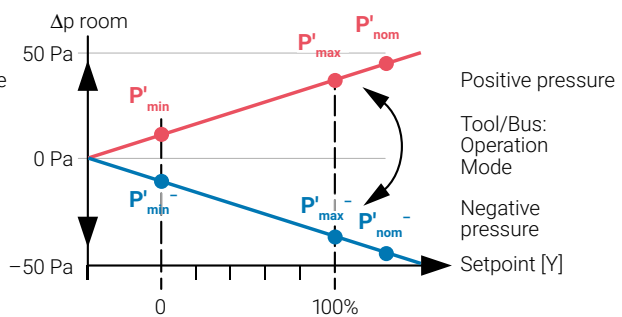
- From Lindab factory the application is supply air and overpressure, this can be changed via Belimo PC Tool or Belimo Assistant App.
- P'_{max} set equal to $P'_{nom} = 25$ Pa.
- P'_{min} is set to 5 Pa. If not providing a control signal, the pressure will then be controlled to 5 Pa.
- The controller dead band is from Lindab factory set for the most accurate possible regulation (+/- 1%).
- The controller sensitivity (regulation speed) is set to high (10).
- In unstable systems, the controller settings can cause the motor to adjust excessively trying to keep the setpoint. Changing the controller dead band and controller sensitivity setting requires Belimo PC Tool.

Function diagram

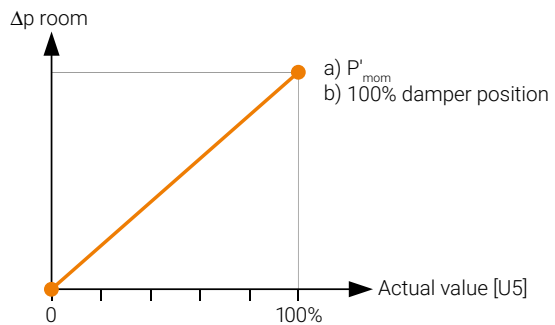
Positive room pressure



Changeover operation: positive/negative pressure



Feedback U5/bus (actual value)



For operation in the negative-pressure range, $P'_{nom}/P'_{max}/P'_{min}$ are mirrored in the negative range.

Example:

- Positive pressure: $P'_{min} 5$ Pa / $P'_{max} 10$ Pa, becomes
- Negative pressure setting: $P'_{min} -5$ Pa / $P'_{max} -10$ Pa

Spring return direction for PRJ-SPR

The damper motor is assembled, so the damper will close when power is cut/shut/switched off. If open damper is desired at power off, then damper must be opened with the attached hand crank and locked with the switch. Then demount motor, turn it around, demount and attach the clamp to opposite site and mount the damper to the shaft again. Be aware to mount when damper is either fully open or fully closed depending on the desired function. See Belimos installation instructions for NF motor.

Volume flow regulator

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Technical data

Application examples from Belimo VAV-Universal Brochure Duct pressure control example.

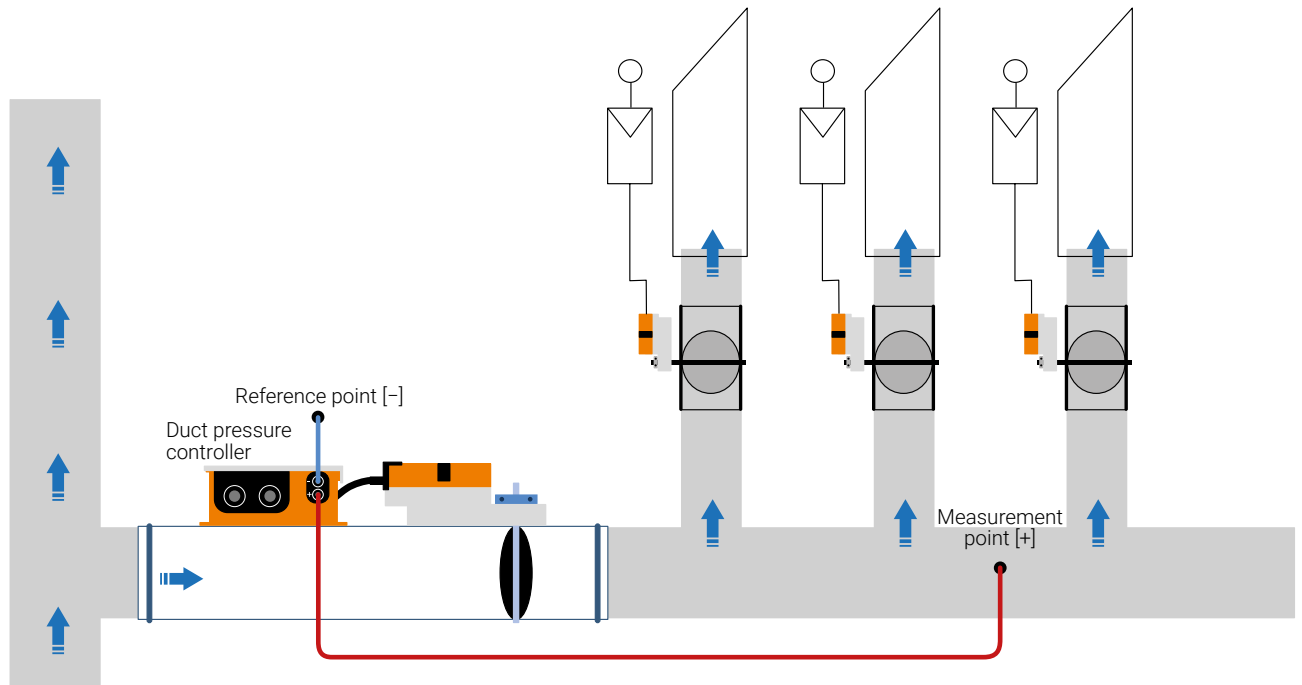
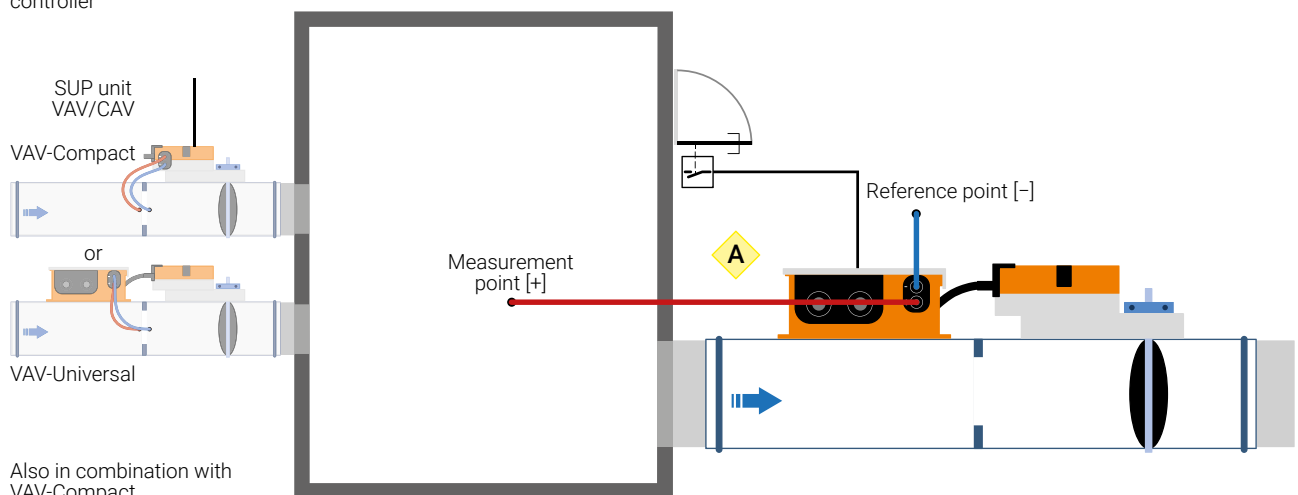


Illustration example

Room pressure control example

Setpoint volumetric flow, e.g. room-temperature or air-quality controller



Also in combination with VAV-Compact

Illustration example

See more application possibilities:
[Belimo VAV-Universal Application Brochure](#)

Volume flow regulator

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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							L _{WA} dB(A)	Velocity app. 3 m/s							L _{WA} dB(A)	Velocity app. 6 m/s							L _{WA} dB(A)						
		Centre frequency Hz								Centre frequency Hz								Centre frequency Hz													
		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	57	63	63	60	59	58	55	53	50	63	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	58	62	62	59	58	57	54	52	49					
	50	49	49	46	45	44	41	39	36	49	54	54	51	50	49	46	44	41	54	59	59	56	55	54	51	49	46				
	20	45	45	42	41	40	37	35	32	45	49	49	46	45	44	41	39	36	49	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	58	64	64	61	60	59	56	54	51	64	67	67	64	63	62	59	57	54				
	100	54	54	51	50	49	46	44	41	54	59	59	56	55	54	51	49	46	59	63	63	60	59	58	55	53	50				
	50	50	50	47	46	45	42	40	37	50	55	55	52	51	50	47	45	42	55	60	60	57	56	55	52	50	47				
	20	46	46	43	42	41	38	36	33	46	50	50	47	46	45	42	40	37	50	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	60	66	66	63	62	61	58	56	53	66	69	69	66	65	64	61	59	56				
	100	56	56	53	52	51	48	46	43	56	61	61	58	57	56	53	51	48	61	65	65	62	61	60	57	55	52				
	50	52	52	49	48	47	44	42	39	52	57	57	54	53	52	49	47	44	57	62	62	59	58	57	54	52	49				
	20	48	48	45	44	43	40	38	35	48	52	52	49	48	47	44	42	39	52	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	59	65	65	62	61	60	57	55	52	65	68	68	65	64	63	60	58	55				
	100	55	55	52	51	50	47	45	42	55	60	60	57	56	55	52	50	47	60	64	64	61	60	59	56	54	51				
	50	51	51	48	47	46	43	41	38	51	56	56	53	52	51	48	46	43	56	61	61	58	57	56	53	51	48				
	20	47	47	44	43	42	39	37	34	47	51	51	48	47	46	43	41	38	51	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	61	67	67	64	63	62	59	57	54	67	70	70	67	66	65	62	60	57				
	100	57	57	54	53	52	49	47	44	57	62	62	59	58	57	54	52	49	62	66	66	63	62	61	58	56	53				
	50	53	53	50	49	48	45	43	40	53	58	58	55	54	53	50	48	45	58	63	63	60	59	58	55	53	50				
	20	49	49	46	45	44	41	39	36	49	53	53	50	49	48	45	43	40	53	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	62	68	68	65	64	63	60	58	55	68	71	71	68	67	66	63	61	58				
	100	58	58	55	54	53	50	48	45	58	63	63	60	59	58	55	53	50	63	67	67	64	63	62	59	57	54				
	50	54	54	51	50	49	46	44	41	54	59	59	56	55	54	51	49	46	59	64	64	61	60	59	56	54	51				
	20	50	50	47	46	45	42	40	37	50	54	54	51	50	49	46	44	41	54	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 / 4500 m³/h							72						
	200	63	63	60	59	58	55	53	50	63	69	69	66	65	64	61	59	56	69	72	72	69	68	67	64	62	59				
	100	59	59	56	55	54	51	49	46	59	64	64	61	60	59	56	54	51	64	68	68	65	64	63	60	58	55				
	50	55	55	52	51	50	47	45	42	55	60	60	57	56	55	52	50	47	60	65	65	62	61	60	57	55	52				
	20	51	51	48	47	46	43	41	38	51	55	55	52	51	50	47	45	42	55	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	60	66	66	63	62	61	58	56	53	66	69	69	66	65	64	61	59	56				
	100	56	56	53	52	51	48	46	43	56	61	61	58	57	56	53	51	48	61	65	65	62	61	60	57	55	52				
	50	52	52	49	48	47	44	42	39	52	57	57	54	53	52	49	47	44	57	62	62	59	58	57	54	52	49				
	20	48	48	45	44	43	40	38	35	48	52	52	49	48	47	44	42	39	52	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	61	68	68	65	64	63	60	58	55	67	71	71	68	67	66	63	61	58				
	100	58	58	55	54	53	50	48	45	57	63	63	60	59	58	55	53	50	62	67	67	64	63	62	59	57	54				
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	20	50	50	47	46	45	42	40	37	49	54	54	51	50	49	46	44	41	53	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	63	69	69	66	65	64	61	59	56	69	72	72	69	68	67	64	62	59				
	100	59	59	56	55	54	51	49	46	59	64	64	61	60	59	56	54	51	64	68	68	65	64	63	60	58	55				
	50	55	55	52	51	50	47	45	42	55	60	60	57	56	55	52	50	47	60	65	65	62	61	60	57	55	52				
	20	51	51	48	47	46	43	41	38	51	55	55	52	51	50	47	45	42	55	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	64	70	70	67	66	65	62	60	57	70	73	73	70	69	68	65	63	60				
	100	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				
	50	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				
	20	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				

Volume flow regulator

PRJ

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							L _{WA} dB(A)	Velocity app. 3 m/s							L _{WA} dB(A)	Velocity app. 6 m/s							L _{WA} dB(A)			
		Centre frequency Hz								Centre frequency Hz								Centre frequency Hz										
		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	500	Flow 300 l/s / 1080 m ³ /h							L _{WA}	Flow 900 l/s / 3240 m ³ /h							L _{WA}	Flow 1800 l/s / 6480 m ³ /h							L _{WA}			
	200	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
	100	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
	50	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
	20	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
1000 x 400	500	Flow 400 l/s / 1440 m ³ /h							L _{WA}	Flow 1200 l/s / 4320 m ³ /h							L _{WA}	Flow 2400 l/s / 6840 m ³ /h							L _{WA}			
	200	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
	100	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
	50	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
	20	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
1000 x 500	500	Flow 500 l/s / 1800 m ³ /h							L _{WA}	Flow 1500 l/s / 5400 m ³ /h							L _{WA}	Flow 3000 l/s / 10800 m ³ /h							L _{WA}			
	200	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
	100	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
	50	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
	20	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
1000 x 600	500	Flow 600 l/s / 2160 m ³ /h							L _{WA}	Flow 1800 l/s / 6480 m ³ /h							L _{WA}	Flow 3600 l/s / 12960 m ³ /h							L _{WA}			
	200	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
	100	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
	50	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
	20	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
		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

PRJ

Technical data

Adjustment and simulation tool

- Graphical display of setpoint and actual values.
- Create and print trend evaluations.
- Useful tool for troubleshooting on the MP-Bus®.
- Access levels can be defined and managed via release code.
- Specialised software for OEMs to make efficient use of the tool in the production process.



ZTH EU Service Tool

- The handy ZTH EU Service Tool is connected directly to the actuator for parameterisation.
- Reliable and proven connection via the tool socket.
- Supply via actuator – always ready.
- MP-Bus® tester integrated (packet counter, signal level).
- ZIP level converter to USB for connecting the actuator with the PC Tool.



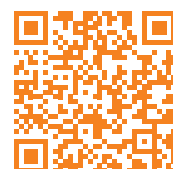
You can find further information about the possible connections of the ZTH EU Service Tool at Belimo.com.

Belimo Assistant App

- Belimo devices marked with the NFC logo can be parameterised.

using the Assistant App

- Can be installed on all Android mobile phones and iPhones.
- Can be operated with ease using the smartphone's touch display.
- The actuator can be parameterised while de-energised.
- Updates are undertaken automatically via the.



ZIP-BT-NFC Bluetooth to NFC converter

- Allows for simple use of the Belimo Assistant App via Bluetooth with Android mobile phones and iPhones in order to parameterise NFC enabled devices.
- Safe to attach to the actuator thanks to countless micro suction cups attached to the bottom.





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