



Data-Pool Values

MP  BUS®

VAV-Universal
VRU-D3-BAC
VRU-M1-BAC
VRU-M1R-BAC

Controller for VAV/CAV and pressure applications

Edition 2024-01 / V1.04


BELIMO®

Contents

Data-Pool general notes

General information	
Identification	
Interface version	4
Configuration	
Timing of MP-Bus queries	
Signed integer	

Data-Pool values overview

Process	5
Configuration	

Data-Pool values

Process data	6-7
Configuration data	8-9

Data-Pool general notes

General information

- The device supports the MP Data-Pool functional profile. All available data points are managed in a data pool and accessible with MP read/write commands.
- This document describes all public data pool values of the device. It's divided into process values and configuration values.
- The MP Data-Pool functional profile is specified in the MP Cooperation Documentation. The document is provided to Belimo MP-Partners.
- See the technical datasheet for technical information about the device itself.

Identification

The connected type can be identified by its series number:

Prefix	Profile type	Profile category	Type
2	1	32	VRU-D3-BAC
2	2	32	VRU-M1-BAC
2	3	32	VRU-M1R-BAC

Configuration

Configuration data are password protected.
The default password is '0000'.

Timing of MP-Bus queries

Client implementations typically poll the servers in cycles (MP1, MP2, MP3, ...). Reading all data pool values of this node in one cycle is not recommended, because it would reduce the overall MP-Bus performance.

Recommendation:

- Split up the queries into several cycles (e.g. 3 queries per cycle).
- Adjust repetition rates (reading values) according to the rate of change of the value.
- Prevent from reading unused data pool values.

Signed integer

Signed integers are represented as two's complement.

Example:

Value of ID X = 1111 1101 1111 0010₂ = -526₁₀

Actual value

= value * scaling factor * unit

= -526 * 0.01 * unit

= **-5.26 unit**

Data-Pool values overview

Process

ID	Name	Access
10	Setpoint [%]	R / W
11	Override Control	R / W
12	Command	R / W
13	Relative Position [%]	R
14	Absolute Position [°]	R
15	Relative Volumetric Flow [%]	R
16	Absolute Volumetric Flow [m ³ /h]	R
17	Sensor 1 Value [mV] [Ω] [-]	R
19	Analog Setpoint [%]	R
20	Relative Delta Pressure [%]	R
21	Absolute Delta Pressure [Pa]	R
23	Malfunction and Service Information	R

Configuration

ID	Name	Access
100	Position	R / W
101	Min [%]	R / W
102	Max [%]	R / W
103	Setpoint Source	R / W
114	Operation Mode	R / W
116	Sensor 1 Type	R / W
117	Application	R
118	Control Mode	R
119	Room Pressure Cascade	R
120	Nominal Volumetric Flow [m ³ /h]	R
123	Nominal Delta Pressure [Pa]	R



All writeable datapoints with ID >100 (configuration data) are persistent and are **not** supposed to be written on a regular basis.

Data-Pool values

Process data

No.	Description Comments	Unit	Scaling	Values	Size	Access
10	<p>Setpoint The setpoint refers to the demanded flow, pressure or damper position according to the selected application and control mode. It is scaled between Min and Max limits.</p> <p>The setpoint is active, if the setpoint is controlled by bus (Setpoint Source =Bus).</p>	%	0.01	0...10'000	2	R / W
11	<p>Override control Overriding the setpoint with defined values</p>	–	–	0: None 1: Open 2: Close 3: Max 4: Min 5: – 6: Motor stop 7: V _{nom} / P _{nom}	1	R / W
12	<p>Command Initiation of actuator functions for service and test. After command is sent, value changes back to None (0).</p>	–	–	0: None 1: Adaptation 2: Test 3: Sync	1	R / W
13	<p>Relative position If the selected application does not support a local actuator (flow measurement, room pressure cascade), the ID is not active.</p>	%	0.01	–	2	R
14	<p>Absolute position If the selected application does not support a local actuator (flow measurement, room pressure cascade), the ID is not active.</p>	°	0.01	–	2	R
15	<p>Relative volumetric flow Related to the "Nominal Volumetric Flow in m³/h" (ID 120)</p> <p>If the selected application does not support flow measurement (pressurecontrol, room pressure control), the entry is inactive (= 65'535).</p>	%	0.01	–	2	R
16	<p>Absolute volumetric flow If the selected application does not support flow measurement (pressure control, room pressure control), the entry is inactive (= 65'535).</p>	m ³ /h	1	–	2	R
17	<p>Sensor 1 value Current value of sensor 1, depending on the setting of the sensor 1 type (ID 116)</p>	mV Ω –	1 1 –	–	2	R
19	<p>Analog setpoint Shows the setpoint in %, if the actuator is controlled by analog signal (ID 103 = analog).</p>	%	0.01	–	2	R
20	<p>Relative Delta Pressure Related to the "Nominal Differential Pressure in Pa" (ID 123)</p>	%	0.01	–	2	R
21	<p>Absolute delta pressure</p>	Pa	0.1	–	2	R

No.	Description Comments	Unit	Scaling	Values	Size	Access
23	Malfunction and service information	-	-	Bit0: - Bit1: - Bit2: - Bit3: - Bit4: Error dP sensor Bit5: - Bit6: Airflow not reached Bit7: - Bit8: Internal activity Bit9: Gear train disengaged Bit10: Bus watchdog triggered Bit11: Actuator doesn't fit to application Bit12: Pressure sensor wrong connected Bit13: Pressure sensor not reached Bit14: Error dP sensor out of range	2	R

Description access: R = Read, W = Write

Configuration Data

No.	Description Comments	Unit	Scaling	Values	Size	Access
100	Position Alphanumeric character string to store the location of the device (optional, helpful for maintenance and troubleshooting).	–	–	One byte per character The string is not null terminated. Fill up unused bytes with 0x20 (space character).	64	R / W
101	Min The min setpoint in % is related to the nominal flow, nominal differential pressure or to the adapted mechanical range of the actuator according to the selected application and control mode.	%	0.01	0...Max	2	R / W
102	Max The max setpoint in % is related to the nominal flow, nominal differential pressure or to the adapted mechanical range of the actuator according to the selected application and control mode.	%	0.01	2'000...10'000	2	R / W
103	Setpoint source Defines whether the setpoint is controlled by the analog input signal on wire 3 or the by bus signal on the serial communication line D+/D- (Modbus RTU).	–	–	0: Analog 1: Bus	1	R / W
114	Operation mode Selection is only available for actuator type VRU-M1R-BAC. It changes the room pressure from positive pressure (default) to negative pressure.	–	–	0: Negative pressure 1: Positive pressure	1	R / W
116	Sensor 1 type If setpoint source (ID 103) is analog (hybrid mode), the sensor 1 type can be set to active (1) in order to see the setpoint analog in mV.	–	–	0: None 1: Active 2: Passive 3: – 4: Switch	1	R / W
117	Application Visualisation of the application selected by the damper manufacturer. VRU-D3-BAC / VRU-M1-BAC: - Flow control - Pressure control - Flow measurement VRU-M1R-BAC: - Room pressure control	–	–	0: Flow control 1: Pressure control 2: Room pressure control 3: Flow measurement	1	R

No.	Description Comments	Unit	Scaling	Values	Size	Access
118	<p>Control mode Visualization of the control mode selected by the damper manufacturer. Available for application "Flow Control" only.</p> <p>If the control mode "Flow Control" is selected, the Min/Max limits are related to "Nominal Volumetric Flow in m³/h".</p> <p>If the control mode "Position Control" is selected, the Min/Max limits are related to the adapted mechanical range of the actuator.</p>	-	-	0: Position control 1: Flow control	1	R
119	<p>Room pressure cascade If the room pressure cascade is enabled, the sensor input S1 will be set as input signal for the room pressure cascade (0-10V).</p>	-	-	0: Disabled 1: Enabled 2: Enabled fast	1	R
120	Nominal volumetric flow	m ³ /h	1	0...60'000	1	R
123	Nominal delta pressure	Pa	0.1	0...10'000	2	R

Description access: R = Read, W = Write

All inclusive.

Belimo as a global market leader develops innovative solutions for the controlling of heating, ventilation and air-conditioning systems. Damper actuators, control valves, sensors and meters represent our core business.

Always focusing on customer value, we deliver more than only products. We offer you the complete product range for the regulation and control of HVAC systems from a single source. At the same time, we rely on tested Swiss quality with a five-year warranty. Our worldwide representatives in over 80 countries guarantee short delivery times and comprehensive support through the entire product life. Belimo does indeed include everything.

The "small" Belimo devices have a big impact on comfort, energy efficiency, safety, installation and maintenance.

In short: Small devices, big impact.



5-year warranty



On site around the globe



Complete product range



Tested quality



Short delivery times



Comprehensive support



BELIMO Automation AG

Brunnenbachstrasse 1, 8340 Hinwil, Switzerland
+41 43 843 61 11, info@belimo.ch, www.belimo.com

BELIMO[®]