Data-Pool Values

MP BUS

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

Controller for VAV/CAV and pressure applications

Edition 2025-10 / V1.04

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Contents

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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

Parametrisation

Tool Belimo Assistant 2

Configuration

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

Bus Watchdog

The Bus Watchdog function can be set via Belimo Assistant 2.
The enabled Bus Watchdog controls the MP-Bus communication.
If neither the Setpoint (ID 10) nor the Override Control (ID 11) is renewed within 120 s the actuator controls to the parameterised Bus Fail position.

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 0010_2 = -526_{10}

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	**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. The setpoint is active, if the setpoint is controlled by bus (Setpoint Source =Bus).	%	0.01	0...10'000	2	R / W
11	**Override control** Overriding the setpoint with defined values	–	–	0: None 1: Open 2: Close 3: Max 4: Min 5: – 6: Motor stop 7: V'_{nom} / P'_{nom}	1	R / W
12	**Command** Initiation of actuator functions for service and test. After command is sent, value changes back to None (0).	–	–	0: None 1: Adaptation 2: Test 3: Sync	1	R / W
13	**Relative position** If the selected application does not support a local actuator (flow measurement, room pressure cascade), the ID is not active.	%	0.01	–	2	R
14	**Absolute position** If the selected application does not support a local actuator (flow measurement, room pressure cascade), the ID is not active.	°	0.01	–	2	R
15	**Relative volumetric flow** Related to the "Nominal Volumetric Flow in m^3/h" (ID 120) If the selected application does not support flow measurement (pressurecontrol, room pressure control), the entry is inactive (= 65'535).	%	0.01	–	2	R
16	**Absolute volumetric flow** If the selected application does not support flow measurement (pressure control, room pressure control), the entry is inactive (= 65'535).	m^3/h	1	–	2	R
17	**Sensor 1 value** Current value of sensor 1, depending on the setting of the sensor 1 type (ID 116)	mV Ω –	1 1 –	–	2	R
19	**Analog setpoint** Shows the setpoint in %, if the actuator is controlled by analog signal (ID 103 = analog).	%	0.01	–	2	R
20	**Relative Delta Pressure** Related to the "Nominal Differential Pressure in Pa" (ID 123)	%	0.01	–15'000...15'000	2	R
21	**Absolute delta pressure**	Pa	0.1	–1000...10'000	2	R

No.	Description Comments	Unit	Scaling	Values	Size	Access
23	**Malfunction and service information** 4: Error occurred during pressure measurement. Contact your local Belimo Representative. 6: Flow setpoint cannot be reached within 10 min during flow control. 8: Actuator performs Adaptation, Test Run or Synchronization 9: The manual override button is pressed. 10: Timeout for the Bus Watchdog expired. 11: Actuator type is not valid for the selected application. Correct actuator type ..-VST 12: Negative pressure measured. Check correct polarity of the pressure tube connection. Check if there is positive duct pressure. 13: Differential pressure setpoint can not be reached within 3 min during pressure control mode. 14: Differential Pressure outside of the valid measuring range. Check sensor type, check System pressure	–	–	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 setpoint not reached Bit14: Error dP sensor out of range	2	R

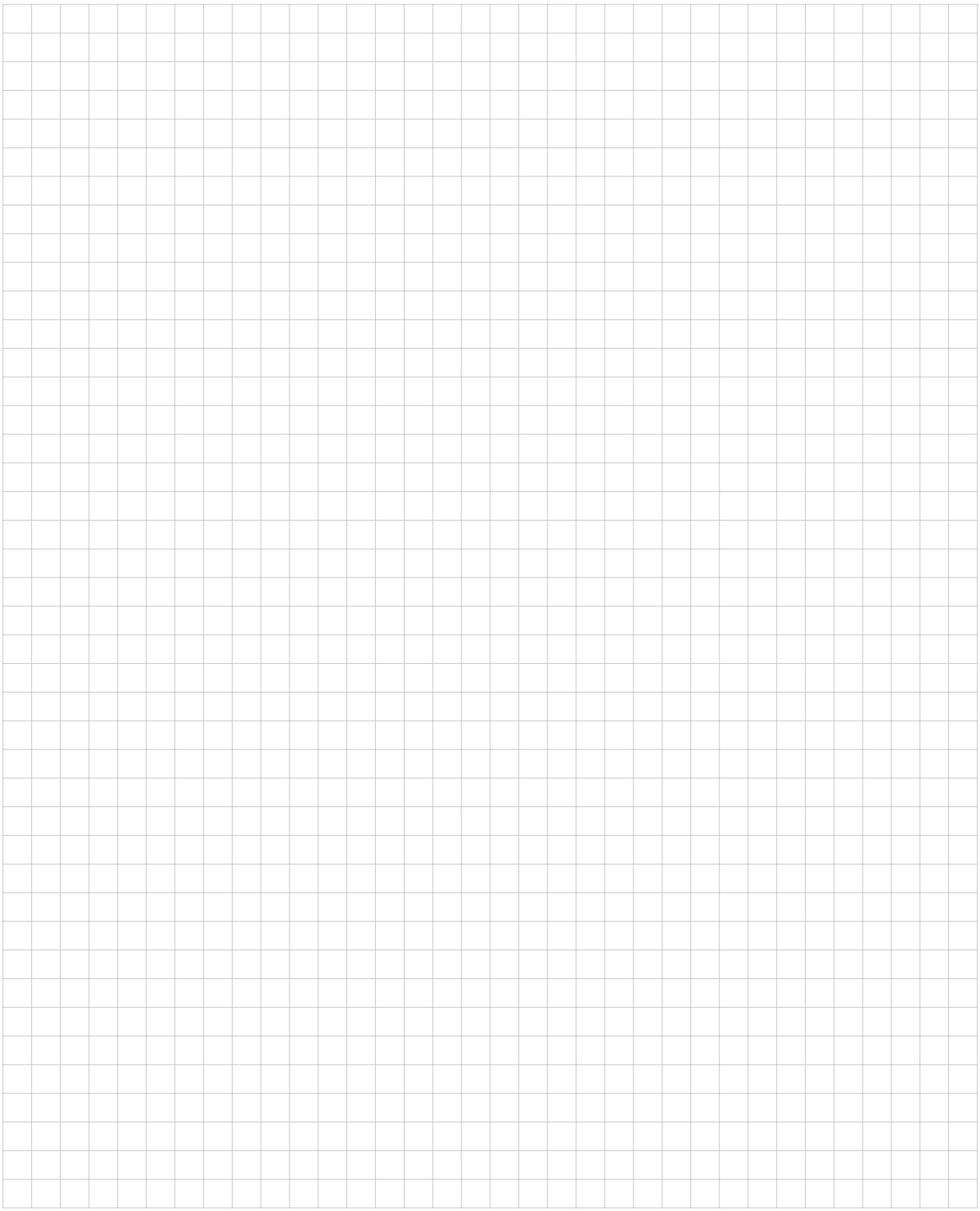
Description access: R = Read, W = Write

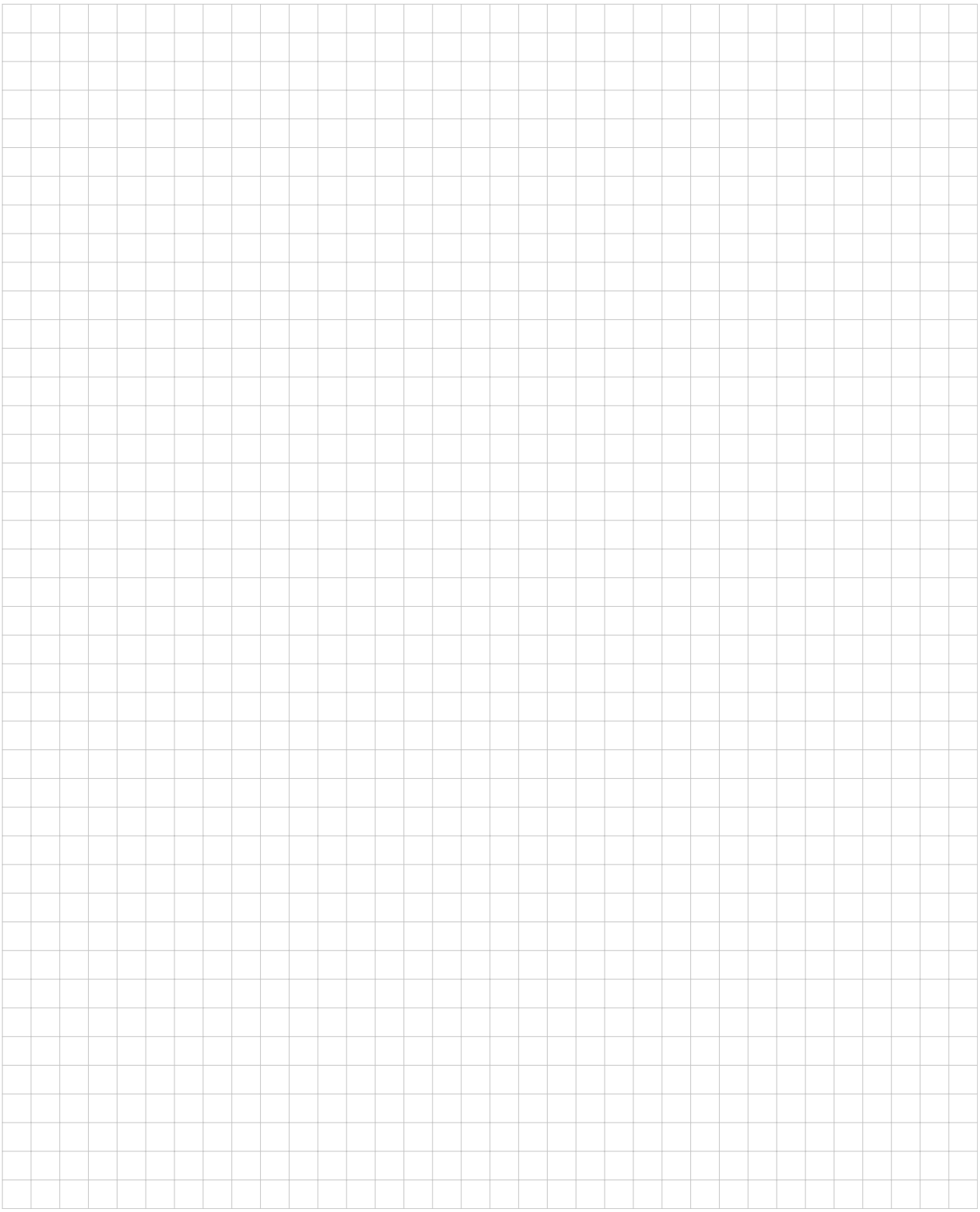
Configuration Data

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	**Control mode** Visualization of the control mode selected by the damper manufacturer. Available if ID117: Application = 0: Flow control 0: Position Control The Min/Max limits are related to the adapted mechanical range of the actuator. 1: Flow Control The Min/Max limits are related to "Nominal volumetric flow in m3/h".	–	–	0: Position control 1: Flow control	1	R
119	**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).	–	–	0: Disabled 1: Enabled 2: Enabled fast	1	R
120	**Nominal volumetric flow**	m^3/h	1	0...60'000	2	R
123	**Nominal delta pressure**	Pa	0.1	0...10'000	2	R

Description access: R = Read, W = Write





All inclusive.

Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation and air-conditioning systems. The focus of our core business is on damper actuators, control valves, sensors and meters.

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

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