



BACnet Interface Description

2-way EPIV, DN 15...150 / V4.3.0
Electronic pressure-independent characterized control valve

Edition 2026-04

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PICS

Protocol Implementation Conformance Statement

General information

Date	22/04/2026
Vendor Name	BELIMO Automation AG
Vendor ID	423
Product Name	2-way EPIV
Product Model Number	EP..R2+(K)BAC EP..F2-16+(K)BAC EP..F2-25+(K)BAC
Application Software Version	EPIV V4.3.0
Firmware Revision	BTL:0005 B:0014 FW:02.00.0003
BACnet Protocol Revision	23
Product Description	Electronic pressure-independent characterized control valve
BACnet Standard Device Profile	BACnet Application Specific Controller (B-ASC)
Segment Capability	No
Data Link Layer Options	MS/TP Manager Node
Device Address Binding	No static device binding supported
Networking Options	None
Character Sets Supported	ISO 10646 (UTF-8)
Gateway Options	None
Network Security Options	Non-secure device
Conformance	BTL listing pending

Power-on behaviour

The initialization of the data after power fail takes up to 190 seconds.
All values remain 0 during power-on.

BACnet Interoperability Building Blocks supported (BIBBs)

Data sharing – ReadProperty-B (DS-RP-B)
Data sharing – ReadPropertyMultiple-B (DS-RPM-B)
Data sharing – WriteProperty-B (DS-WP-B)
Data sharing – COV-B (DS-COV-B)
Device management – DynamicDeviceBinding-B (DM-DDB-B)
Device management – DynamicObjectBinding-B (DM-DOB-B)
Device management – DeviceCommunicationControl-B (DM-DCC-B)

BACnet MS/TP

Baud Rates	9'600, 19'200, 38'400, 76'800, 115'200 (Default: 38'400)
Address	0..127 (Default: 1)
Number of Nodes	Max. 32 (without repeater), 1 full bus load
Terminating Resistor	120 Ω

Configuration

Tool	Belimo Assistant 2
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All writeable objects with instance number ≥ 90 which are persistent are **not** supposed to be written on a regular basis. Designated data points are highlighted in colour in the document.

Standard object types supported

Object type	Optional properties	Writeable properties
Device	Description Location Active COV Subscriptions Max Manager Max Info Frames Profile Name	Object Identifier Object Name Location Description APDU Timeout (1'000...60'000) Number of APDU Retries (0...10) Max Manager (1...127) Max Info Frames (1...255)
Network Port Object (Network Type = MS/TP)	Link Speeds	Link Speed Mac Address (00..7F) Max Info Frames (1...255) Max Manager (1...127)
Analog Input [AI]	Description COV Increment	COV Increment
Analog Output [AO]	Description COV Increment	Present Value COV Increment Relinquish Default
Analog Value [AV]	Description COV Increment	Present Value COV Increment
Binary Input [BI]	Description Active Text Inactive Text	–
Binary Value [BV]	Description Active Text State Text	Present Value
Multi-state Input [MI]	Description State Text	–
Multi-state Value [MV]	Description State Text	Present Value
Positive Integer Value [PIV]	Description	–

The device does not support the services CreateObject and DeleteObject.

The specified maximum length of writeable strings is based on single-byte characters.

- Object name 32 char
- Location 64 char
- Description 64 char

Service processing

The device supports the DeviceCommunicationControl services.
No password is required.

A maximum of 5 active COV subscriptions with a lifetime of 1...28'800 s. (max. 8 hours) are supported.

Object descriptions

Control and general settings

These objects can be used to control and configure the fundamental functionalities and read the corresponding feedback values of the 2-way EPIV.

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
Device	Device [Inst.No]	BACnet internetwork-wide unique number for device identification	0...4'194'302 Default: 1	–	R / W
Network Port Object	NPO [101]	See table Standard object types supported for list of writeable properties.	–	–	–
SpRel	AO[1]	<p>Setpoint relative in % The setpoint is related to either the position or the volumetric flow (of V'_{min}, V'_{max}).</p> <p>The data point is active if the setpoint is controlled by MV[122]: Setpoint source = 2: Bus.</p> <p>See also AV[90]: Minimum volumetric flow limit in % AV[94]: Maximum volumetric flow limit in % AV[100]: Nominal volumetric flow in selected unit</p> <p>Overridden = true if MV[122]: Setpoint source = 1: Analog or if forced control (bus, tool and/or analog forced control) is active.</p>	0...100 Default: 0	0.01...100 Default: 1	C
SpAnalog	AI[6]	<p>Setpoint analog in % Shows the setpoint in % if actuator is controlled by MV[122]: Setpoint source = 1: Analog.</p> <p>Not considered if override control (bus, tool and/or analog forced control) is active.</p> <p>If MV[122]: Setpoint source = 2: Bus, then Out_Of_Service is TRUE.</p> <p>Overridden = if forced control (bus, tool and analog forced control) is active</p>	0...100	0.01...100 Default: 1	R
RelPos	AI[1]	<p>Relative position in % Overridden = true, if the gear train is disengaged</p>	0...100	0.01...100 Default: 1	R
AbsPos	AV[2]	<p>Absolute position in ° Overridden = true if the gear train is disengaged</p>	0...96	0.01...96 Default: 1	R
SpSource	MV[122]	<p>Setpoint source 1: Setpoint from analog signal 0.5...10 V on wire 3 2: Relative setpoint via Bus AO[1]: Setpoint relative.</p>	1: Analog 2: Bus Default: 1	–	R / W
ControlMode	MV[100]	<p>Control mode This value defines the interpretation of the setpoint. A reset will be performed, if the state of this object is changed.</p>	1: Position Control 2: Flow Control Default: 2	–	R / W
Override	MV[1]	<p>Override control Override the setpoint with defined values</p> <p>Override minimum or maximum correspond to Position or Flow control mode.</p>	1: None 8: – 2: Open valve 9: – 3: Close valve 10: – 4: Minimum 11: Motor 5: – Stop 6: Maximum Default: 1 7: Nominal	–	R / W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
Command	MV[120]	Command Initiation of actuator functions for service and test. After command is sent, value returns to 1: None.	1: None 2: – 3: Synchronization Default: 1	–	R / W
Bus Fail Action After Startup	BV [123]	Bus fail action after startup If enabled, the Bus Fail Action is immediately applied on startup. Otherwise, the configured AV [130]: Timeout for bus watchdog is taken into account. Triggered Bus Fail Action After Startup is indicated in AV [140] ErrorState.	1: Disabled 2: Enabled	–	R / W
BusFailAction	MV[130]	Bus fail action In the event of a breakdown in communication, the actuator enables the bus watchdog fail action. The bus monitoring controls the BACnet communication. If neither AO[1]: Setpoint relative nor MV[1]: Override control is renewed before the Timeout for AV[130]: Bus watchdog, the actuator moves to the bus fail position. Triggered bus monitoring is indicated in AV[140]: ErrorState.	1: None 2: Open 3: Close 4: Max 5: Min 6: – 7: Stop Default: 1	–	R / W
BusWatchdog	AV[130]	Timeout for Bus watchdog in s If no write request is received within the timeout, the device will execute the action defined in MV[130]: Bus fail action	5...3'600 Default: 120	1...3'595 Default: 1	R / W
BusTermination	BV[99]	Bus termination Indicates if bus termination (120 Ω) is enabled. Bus termination can be set with Belimo Assistant 2.	0: Disabled 1: Enabled Default: 0	–	R
StatusActuator	MV[106]	Status actuator 2: Mechanical overload due to blocked valve etc. 3: Manual override button is pressed 4: Communication with actuator not possible	1: OK 2: Actuator cannot move 3: Gear train disengaged 4: No communication to actuator	–	R

Access definition: R = Read, W = Write, C = Commandable with priority array

Note: According to the present configuration settings of the EPIV (e.g. DN size), the HVAC application may perform a size limitation within the indicated BACnet value range. Each EPIV may have different HVAC value size limitations. See corresponding product datasheet.

Flow

These objects can be used to configure and read values related to Flow control.
For setpoint, see AO[1]: Setpoint relative in section "Control and general settings".

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
SpAbsFlow_ UnitSel	AV[17]	Setpoint absolute volumetric flow in selected unit → Unit can be selected by MV[123]: Unit selection flow	0...0.05 m ³ /s 0...180 m ³ /h 0...50 l/s 0...3'000 l/min 0...180'000 l/h 0...792.5 gpm 0...105.9 cfm	0.001...180'000 Default: 1	R
RelFlow	AV[10]	Relative Volumetric flow in % Related to V' _{max} AV[94]: Maximum volumetric flow limit in %, AV[97]: Maximum volumetric flow limit in selected unit.	0...150	0.01...150 Default: 1	R
AbsFlow_UnitSel	AV[19]	Absolute volumetric flow in selected unit Sensor reading up to 2.5* V' _{nom} possible. Actual measuring range depends on device type (see datasheet). → Unit can be selected by MV[123]: Unit selection flow	0...0.104 m ³ /s 0...375 m ³ /h 0...104.167 l/s 0...6'250 l/min 0...375'000 l/h 0...1'654.075 gpm 0...220.716 cfm	0...375'000 Default: 1	R
Vmin	AV[90]	Minimum volumetric flow limit in % (V' _{min})	0...V' _{max}	0.01...100 Default: 1	R / W
Vmin_UnitSel	AV[93]	Minimum volumetric flow (V' _{min}) → Unit can be selected by MV[123]: Unit selection flow	0..0.012 m ³ /s 0..4.500 m ³ /h 0..1.250 l/s 75.0 l/min 0..4'500 l/h 0..19.812 gpm 0..2.647 cfm	0.001... 180'000 Default: 1	R / W
Vmax	AV[94]	Maximum volumetric flow limit in % (V' _{max}) Maximum volumetric flow limit relative to V' _{nom} AV[100] : Nominal Volumetric Flow considered when MV[100]: Control Mode = 2: Flow Control. Values below 25% will be adjusted to 25%.	25...100 Default: 100	0.01...100 Default: 1	R / W
Vmax_UnitSel	AV[97]	Maximum volumetric flow limit in selected unit (V' _{max}) → Unit can be selected by MV[123]: Unit selection flow Values below 25% will be adjusted to 25%.	0.0001...0.05 m ³ /s 0.375...180 m ³ /h 0.104...50 l/s 6.250...3'000 l/min 374.994...180'000 l/h 1.651...792.5 gpm 0.221...105.9 cfm	0.001...180'000 Default: 1	R / W
Vnom_UnitSel	AV[100]	Nominal volumetric flow in selected unit (V' _{nom}) → Unit can be selected by MV[123]: Unit selection flow	0...0.05 m ³ /s 0...180 m ³ /h 0...50 l/s 0...3'000 l/min 0...180'000 l/h 0...792.5 gpm 0...105.9 cfm	0.001...180'000 Default: 1	R

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
UnitSelFlow	MV[123]	Unit selection volumetric flow The selected unit is valid for: AV[17]: Setpoint absolute volumetric flow AV[19]: Absolute volumetric flow in selected unit AV[93]: Minimum volumetric flow AV[97]: Maximum volumetric flow limit in selected unit AV[100]: Nominal volumetric flow limit in selected unit	1: m ³ /s 5: l/h 2: m ³ /h 6: gpm 3: l/s 7: cfm 4: l/min Default: 5	–	R / W
Volume_UnitSel	AV[52]	Accumulated volume in selected unit → Unit can be selected by MV[126]: Unit selection volume	0...42'000'000 m ³ 0...42'000'000'000 l 0...11'095'226'199 gal 0...1'483'216'002.3 cf	1...42'000'000'000 Default: 1	R
VolumePIV_ UnitSel	PIV[50]	Accumulated volume in selected unit → Unit can be selected by MV[126]: Unit selection volume	0...42'000'000 m ³ 0...42'000'000'000 l 0...11'095'226'199 gal 0...1'483'216'002 cf	–	R
UnitSelVolume	MV[126]	Unit selection volume The selected unit is valid for AV[52]: Accumulated volume in selected unit and PIV[50]: Accumulated volume in selected unit.	1: m ³ 4: Cubic 2: Litre foot 3: Gallon Default: 1	–	R / W
StatusSensor	MV[103]	Status sensor Indicates information within the flow sensor and temperature sensor 2: Air in the system, error occurred during flow measurement 3: Error with embedded temperature sensor 4: – 5: Internal communication to flow sensor interrupted	1: OK 2: Flow measurement error 3: Flowbody temperature not OK 4: – 5: Communication to flow sensor interrupted	–	R
StatusFlow	MV[104]	Status flow 2: Actual flow exceeds the designed nominal flow 3: Flow is measured, but valve position is closed. Actuator incorrectly mounted. 4: Setpoint cannot be reached within 15 min. during flow control. Pump pressure too low; high resistance in the flow circuit; flushing bypass open; V _{max} setting too high. 5: Reverse flow detected. Pump pressure too low; high resistance in the flow circuit; flushing bypass open; V _{max} setting too high.	1: OK 2: Actual flow exceeds nominal flow 3: Flow with closed valve 4: Flow setpoint cannot be reached 5: Reverse flow	–	R
StatusMedia	MV[105]	Status media 2: Medium contains glycol. 3: Measured temperature and glycol concentration indicated that grease ice can build up	1: OK 2: Glycol detected 3: Freeze warning	–	R
GlycolConcentration	AV[60]	Glycol concentration in % Actual measuring range depends on device type (see datasheet).	0...60	0.01...60 Default: 1	R
MeterSerialNo_ Part1	PIV[201]	Flow meter serial number first digits ProductionOrderNumber	–	--	R
MeterSerialNo_ Part2	PIV[202]	Flow meter serial number last digits ProductionSequenceNumber	–	–	R

Temperature

The measured temperature values can be read out via the object below.

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
T_UnitSel	AI[23]	Temperature (flow body) in selected unit → Unit can be selected by MV[127]: Unit selection temperature sensors	-20...150°C 253.15...423.15 K -4...302°F	0.01...306 Default: 1	R

Conversion of sensor signals

These objects can be used to configure the additional Sensor 1 Input on Y3 and related values.

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
Sens1Active_Volt	AI[20]	Sensor 1 as voltage in V If MV[220]: Sens1Type is not = 2: Active, then Out_Of_Service is TRUE	0...15	0.01...15 Default: 0.1	R
Sens1Switch	BI[20]	Sensor 1 as switch If MV[220] Sens1Type is not = 5: Switch, then Out_Of_Service is TRUE	0: Inactive 1: Active	–	R
UnitSelTemperature	MV[127]	Unit selection temperature sensors The selected unit is valid for AI[23]: Temperature (flow body) in selected unit	1: °C 2: K 3: °F Default: 1	–	R / W
Sens1Type	MV[220]	Sensor 1 Type Additional sensor input Only selectable if MV[122]: Setpoint source is = 2: Bus.	1: None 2: Active volt 3: – 4: – 5: Switch Default: 1	–	R / W

Access definition: R = Read, W = Write, C = Commandable with priority array

Note: According to the present configuration settings of the EPIV (e.g. DN size), the HVAC application may perform a size limitation within the indicated BACnet value range. Each EPIV may have different HVAC value size limitations. See corresponding product datasheet.

Health state

This object allow to determine malfunctions, service information and error states of the 2-way EPIV.

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
ErrorState	AV[140]	<p>Error state</p> <p>Value is bit-coded. More than one bit can be set to 1. Not all bits mentioned in the enumeration are used for this product range.</p> <p>Bitmask =</p> <p>0: Communication with actuator not possible. Defective components, cable disconnected</p> <p>1: Manual override button is pressed.</p> <p>2: Mechanical overload due to blocked valve, etc.</p> <p>3: Reverse flow is detected. Pump pressure too low; high resistance in the flow circuit; flushing bypass open; V'_{max} setting too high.</p> <p>4: Setpoint cannot be reached within 15 min during flow control. Pump pressure too low; high resistance in the flow circuit; flushing bypass open; V'_{max} setting too high.</p> <p>5: Flow is measured, but valve position is closed. Actuator incorrectly mounted.</p> <p>6: Actual flow exceeds the designed nominal flow</p> <p>7: Air in the system, error occurred during flow measurement. Water contamination, not specified fluid used.</p> <p>9: Error with embedded temperature sensor.</p> <p>10: Internal communication to flow sensor interrupted.</p> <p>11: Measured temperature and glycol concentration indicate that grease ice can build up.</p> <p>12: Medium contains glycol.</p> <p>15: Timeout for the Bus watchdog expired. No update of Setpoint / Override within specified time.</p>	<p>Bitmask =</p> <p>0: No communication to actuator</p> <p>1: Gear train disengaged</p> <p>2: Actuator cannot move</p> <p>3: Reverse flow</p> <p>4: Flow setpoint not reached</p> <p>5: Flow with closed valve</p> <p>6: Flow actual exceeds flow nominal</p> <p>7: Flow measurement error</p> <p>8: -</p> <p>9: Flowbody temperature error</p> <p>10: Communication to sensor interrupted</p> <p>11: Freeze warning</p> <p>12: Glycol detected</p> <p>13: -</p> <p>14: -</p> <p>15: Bus watchdog triggered</p> <p>16: -</p> <p>17: -</p> <p>18: -</p> <p>19: -</p> <p>20: -</p> <p>21: Bus Fail Action After Startup active</p>	1...65'535 Default: 1	R

Access definition: R = Read, W = Write, C = Commandable with priority array

Note: According to the present configuration settings of the EPIV (e.g. DN size), the HVAC application may perform a size limitation within the indicated BACnet value range. Each EPIV may have different HVAC value size limitations. See corresponding product datasheet.

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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