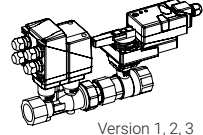
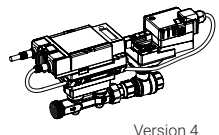


BACnet Interface Description

Where is the Ethernet socket?	
On the actuator	On the flow sensor
 <p>Version 1, 2, 3</p>	 <p>Version 4</p>
<p>✗ See „Data-pool Vaues Energy Valve (V1, V2, V3)”</p>	<p>✓ Stay with this document</p>
<p>For guidance in replacing an old EV with EV V4 -> see “Replacement Guide V1, V2, V3 vs. V4”</p>	



Energy Valve DN 15...50 (Version 4)

Edition 2023-12 / V4.1.1



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BACnet object description

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Protocol Implementation Conformance Statement – PICS

General information

Date	15.01.2022
Vendor Name	BELIMO Automation AG
Vendor ID	423
Product Name	Energy Valve
Product Model Number	EV..R2+(K)BAC (Version 4, DN 15...50) EV..R2+MID (Version 4, DN 15...50) EV..R3+BAC (Version 4, DN 15...50)
Application Software Version	04.01.0000
Firmware Revision	14.10.0002
BACnet Protocol Revision	1.14
Product Description	Electronic pressure-independent characterised control valve with energy monitoring
BACnet Standard Device Profile	BACnet Application Specific Controller (B-ASC)
Segment Capability	No
Data Link Layer Options	MS/TP master BACnet IP, (Annex J) BACnet IP, (Annex J), Foreign Device
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	Listed by BTL

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

BACnet IP

Port	open (Default: 47'808)
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Parametrisation

Tool	Belimo Assistant App or integrated webserver
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All writeable objects with instance number ≥ 90 which are persistent are **not** supposed to be written on a regular basis.

Standard object types supported

Object type	Optional properties	Writeable properties
Device	Description Location Active COV Subscriptions Max Master Max Info Frames Profile Name	Object Identifier Object Name Location Description APDU Timeout (1'000...60'000) Number of APDU Retries (0...10) Max Master (1...127) Max Info Frames (1...255)
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 Output [MO]	Description State Text	Present Value Relinquish Default
Multi-state Value [MV]	Description State Text	Present Value

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

BACnet object description

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. BACnet MS/TP: This value plus the parameterized MAC address (0...127) define the Device-ID.	0...4'194'302 Default: 1	–	W
RelPos	AI[01]	Relative position in % Overridden = true, if the gear train is disengaged	0...100	0.01...100 Default: 1	R
SpAnalog	AI[6]	Analog setpoint If SetpointSource MV[122] is not 1: Analog then Out_Of_Service is TRUE Overridden = true, if forced control (bus, tool and analog forced control) is active	0...100	0.01...100 Default: 1	–
Sens1Active_Volt	AI[20]	Sensor 1 as voltage in V If Sens1Type MV[220] is not 2: Active then Out_Of_Service is TRUE	0...15	0.01...15 Default: 1	R
Sens1Passive_Ohm	AI[21]	Sensor 1 as resistor in Ω If Sens1Type MV[220] is not 4: Passive then Out_Of_Service is TRUE	0.1...1'000'000	0.1...1'000'000 Default: 1	R
T1_UnitSel	AI[22]	Temperature 1 (remote) in selected unit → based on selection in MV[127]	-20...120	0.01...252 Default: 1	R
T2_UnitSel	AI[23]	Temperature 2 (flow body) in selected unit → based on selection in MV[127]	-20...120	0.01...252 Default: 1	R
SpRel	AO[1]	Setpoint relative in % The set point is related to either the position, the flow (of V_{min} , V_{max}) or the power (of P_{max}). See also AV[90], AV[94], MV[100], AV[110] Overridden = true, if forced control (bus MV[1], tool and analog forced control) is active	0...100 Default: 0	0.01...100 Default: 1	C
AbsPos	AV[2]	Absolute position in ° Overridden = true, if the gear is disengaged	0...96	0.01...96	R
RelFlow	AV[10]	Relative volumetric flow in % Related to V_{max} "Maximal Flow Limit" (AV[94], [AV97])	0...150	0.01...150 Default: 1	R
SpAbsFlow_UnitSel	AV [17]	Setpoint absolute flow in selected unit Unit can be selected with object MV[123] Overridden = true, if forced control (bus, tool and analog forced control) is active	0...1,5* V'_{nom}	0...1,5* V'_{nom}	R
AbsFlow_UnitSel	AV[19]	Absolute flow in selected unit → based on selection in MV[123]	0...1,5* V'_{nom}	0...1,5* V'_{nom}	R
Sens1Temp_UnitSel	AV[20]	Sensor 1 as temperature in selected unit → based on selection in MV[127] If Sens1PassiveType MV[221] is 1: None or Sens1Type MV[220] is not 3: Passive then Out_Of_Service is TRUE	-20...248	0.01...252 Default: 1	R
DeltaT_UnitSel	AV[22]	Delta Temperature in selected unit → based on selection in MV[128]	0...140	0.01...810 Default: 1	R
RelPower	AV[40]	Relative power in %	0...300	0.01...300 Default: 1	R

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
CoolingPower_ UnitSel	AV[45]	Cooling power in selected unit → based on selection in MV[124]	0...74'150'000	0.1...73'361'050 Default: 1	R
HeatingPower_ UnitSel	AV[46]	Heating power in selected unit → based on selection in MV[124]	0...74'150'000	0.1...73'361'050 Default: 1	R
CoolingEnergy_ UnitSel	AV[47]	Cooling energy in selected unit → based on selection in MV[125] See also MV[200]	0...2'147'483'641	1...1.35E12 Default: 1	R
HeatingEnergy_ UnitSel	AV[48]	Heating energy in selected unit → based on selection in MV[125] See also MV[200]	0...2'147'483'641	1...1.35E12 Default: 1	R
VolumeDecimal_ UnitSel	AV[50]	Decimal number of the Volume_m³ object Resolution of 0.01 m ³ of the Object PIV[50]. See also MV[200]	0.01...0.99	0.01...0.99	R
Volume_ UnitSel	AV[52]	Accumulated volume in selected unit → based on selection in MV[126] See also MV[200]	0...2'147'483'641	1...4.2E10 Default: 1	R
Glycol Concentration	AV[60]	Glycol concentration in % Measured value or override value in settings	0...100	0.01...100 Default: 1	R
Vmin	AV[90]	Minimum flow limit in %	0...100	0.01...100 Default: 1	R
Vmin_ UnitSel	AV[93]	Minimum flow limit in selected unit → based on selection in MV[123]	0...360'000	0...360'000 Default: 1	W
Vmax	AV[94]	Maximum flow limit in % between 25% and 100% of V_{nom} Values below 25% will be adjusted to 25%. The maximum flow setpoint is related to V _{nom} "Nominal volumetric Flow" (AV[100]) and is considered when Control Mode = Flow Control or Power Control.	0...100	0.01...100 Default: 1	W
Vmax_ UnitSel	AV[97]	Maximum flow limit in selected unit → based on selection in MV[123]	0...360'000	0...360'000 Default: 1	W
Vnom_ UnitSel	AV[100]	Nominal volumetric flow in selected unit → based on selection in MV[123]	0...360'000	0...360'000 Default: 1	R
Pmax	AV[110]	Maximum power limit in %	0...100	0.01...100 Default: 1	W
Pmax_ UnitSel	AV[113]	Maximum power limit in selected unit → based on selection in MV[124]	0...74'150'000	0.01...73'361'050 Default: 1	W
Pnom_ UnitSel	AV[116]	Nominal power in selected unit → based on selection in MV[124]	0...21'500	0.01...73'361'050 Default: 1	R
SpDeltaT_ UnitSel	AV[120]	Setpoint delta temperature in selected unit → based on selection in MV[128]	0...99	0.01...99 Default: 1	W
SpAbsFlow DeltaT_ UnitSel	AV[127]	Setpoint absolute flow at Delta T in selected unit → based on selection in MV[123]	0...360'000	0...360'000 Default: 1	W
BusWatchdog	AV[130]	Timeout for bus watchdog in s Non functional. Reserved for future extension	0...3'600 Default: 0	0.01...120 Default: 1	W

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>0: No communication to actuator: Communication with actuator not possible. 1: Gear disengagement: Gear disengaged button is pressed 2: Actuator cannot move: Mechanical overload due to blocked valve, etc. (only available for EV..R+KBAC) 3: Reverse flow: Reverse flow is detected 4: Flow setpoint not reached: Setpoint cannot be reached within 15 min during flow control 5: Flow with closed valve: Flow is measured but position of valve is closed 6: Flow actual exceeds flow nominal: Actual flow exceeds the designed nominal flow 7: Flow measurement error: Air in the system, error occurred during flow measurement 8: Remote temperature not OK: No connection to external temperature sensor 9: Flowbody temperature not OK: Error with embedded temperature sensor 10: Communication to sensor interrupted: Internal communication to flow sensor interrupted 11: Freeze warning: Measured temperature & glycol concentration indicate that grease ice can build up 12: Glycol detected: Glycol was detected in a MID application 13: Power setpoint not reached: Setpoint cannot be reached within 15 min during power control</p>	<p>Bitmask =</p> <p>0: No communication to actuator 1: Gear disengaged 2: Actuator cannot move 3: Reverse flow 4: Flow setpoint not reached 5: Flow with closed valve 6: Flow actual exceeds flow nominal 7: Flow measurement error 8: Remote temperature not OK 9: Flowbody temperature not OK 10: Communication to Sensor interrupted 11: Freeze warning 12: Glycol detected 13: Power setpoint not reached 14: – 15: –</p>	<p>1...16'383 Default: 0</p>	R

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

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	Access
Sens1Switch	BI [20]	Sensor 1 as switch If Sens1Type MV[220] is not 5: Switch then Out_Of_Service is TRUE	0: Inactive 1: Active	R
BusTermination	BV[99]	Bus termination	0: Disabled 1: Enabled	R
Override	MV[1]	Override control Overrides setpoint with defined values	1: None 2: Open Valve 3: Close Valve 4: Minimum 5: – 6: Maximum 7: Nominal 8: – 9: – 10: – 11: Motor stop Default: 1	C
SummaryStatus	MV[99]	Summary status Summarizes all status MV[102] – MV[107]	1: OK 2: Warning 3: Not OK	R
ControlMode	MV[100]	Control mode This value defines the interpretation of the setpoint A Reset will be performed, if the state of this object is changed.	1: Position control 2: Flow control 3: Power control Default: 2	W
DeltaT_Limitation	MV[101]	DeltaT limitation 1: Disabled: dT-Manager not active 2: dT-Manager: dT-Manager active with no restriction to flow 3: dT-Manager scaling: dT-Manager active with restriction of flow → AV[120]	1: Disabled 2: dT-Manager 3: dT-Manager scaling Default: 1	W
StatusDelta™gr	MV[102]	Status DeltaT manager 1: Not selected: dT-Manager deactivated 2: Standby: dT-Manager activated but not active 3: Active: dT-Manager active 4: Scaling standby: dT-Manager active with no limitation to the flow 5: Scaling active: dT-Manager active with limitation to the flow → AV[120]	1: Not selected 2: Standby 3: Active 4: Scaling standby 5: Scaling active	R
StatusSensor	MV[103]	Status sensor Indicates informations within the flow sensor and both temperature sensors 2: Flow measurement error: Air in the system, error occurred during flow measurement. 3: Flowbody temperature not OK: Error with embedded temperature sensor 4: Remote temperature not OK: No connection to external temperature sensor 5: Communication to sensor interrupted: Internal communication to flow sensor interrupted	1: OK 2: Flow measurement error 3: Flowbody temperature not OK 4: Remote temperature not OK 5: Communication to flow sensor interrupted	R
StatusFlow	MV[104]	Status flow Actual flow exceeds nominal flow: Actual flow exceeds the designed nominal flow. 3: Flow in closed position: Flow is measured but position of valve is closed 4: Flow not reached: Setpoint cannot be reached within 3min during flow control 5: Reverse flow detected: Energy Valves detected a reverse flow	1: OK 2: Actual flow exceeds nominal flow 3: Flow with closed valve 4: Flow setpoint cannot be reached 5: Reverse flow	R

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	Access
StatusMedia	MV[105]	Status media 2: Glycol detected: Glycol was detected in a MID application 3: Freeze warning: Measured temperature & glycol concentration indicate that grease ice can build up	1: OK 2: Glycol detected 3: Freeze warning	R
StatusActuator	MV[106]	Status actuator 2: Actuator cannot move: Mechanical overload due to blocked valve, etc. (only available for EV..R+KBAC) 3: Gear disengaged: Gear disengaged button is pressed 4: No communication to actuator: Communication with actuator not possible	1: OK 2: Actuator cannot move 3: Gear train disengaged 4: No communication to actuator	R
StatusPower	MV[107]	Status power 2: Power not reached: Setpoint cannot be reached within 15 min during power control	1: OK 2: Power not reached	R
StatusPower	MV[107]	Status power 2: Power not reached: Setpoint cannot be reached within 15 min during power control	1: OK 2: Power not reached	R
Command	MV[120]	Initiate function Initiation of actuator functions for service and test. After command is sent, value returns to None(1).	1: None 2: – 3: Synchronization Default: 1	W
SpSource	MV[122]	Setpoint source If Analog(1) then actuator is controlled by analog signal 0...10 V on wire 3. If Bus(2) then setpoint via bus SpRel AO[1]	1: Analog 2: Bus Default: 1	W
UnitSelFlow	MV[123]	Unit selection flow The selected unit is valid for AV[17], AV[19], AV[93], AV[97], AV[100], AV[127]	1: m ³ /s 2: m ³ /h 3: l/s 4: l/min 5: l/h 6: gpm 7: cfm Default: 5	W
UnitSelPower	MV[124]	Unit selection power The selected unit is valid for AV[45], AV[46], AV[113], AV[116]	1: W 2: kW 3: MW 4: BTU/h 5: kBTU/h 6: ton Default: 2	W
UnitSelEnergy	MV[125]	Unit selection energy The selected unit is valid for AV[47], AV[48], PIV[31], PIV[32]	1: J 2: kJ 3: MJ 4: GJ 5: Wh 6: kWh 7: MWh 8: BTU 9: kBTU 10: tonh Default: 6	W
UnitSelVolume	MV[126]	Unit selection volume The selected unit is valid for AV[50], AV[52], PIV[50]	1: m ³ 2: Litre 3: Gallon 4: Cubic foot Default: 1	W
UnitSelTemperature	MV[127]	Unit selection temperature sensors The selected unit is valid for AV[20], AI[22], AV[23]	1: °C 2: K 3: °F Default: 1	W
UnitSelDeltaT	MV[128]	Unit selection delta T The selected unit is valid for AV[22]	1: °C 2: K 3: °F Default: 2	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	Access
SelectMeter Registers	MV[200]	<p>Select meter registers Select between certified meter register and lifetime register. Value 1 only available for models with MID certification EV..R2+MID. For non MID certified models Values 2 is defined as default.</p> <p>1: The certified meter register will be reset when the sensor module is replaced. 2: The lifetime register is compensated for glycol (if applicable).</p> <p>Avoid toggling between the two registers as this will affect data logging.</p>	<p>1: Certified meter register 2: Lifetime meter register Default: 1 (2)</p>	W
Sens1Type	MV[220]	<p>Sensor 1 type Additional Sensor input. Only selectable if SpSource MV[122] is set to bus.</p>	<p>1: None 2: Active volt 3: – 4: Passive 5: Switch Default: 1</p>	W
Sens1TempType	MV[221]	<p>Sensor 1 passive type</p>	<p>1: None 2: PT1000 3: Ni1000EU 4: – 5: – 6: – 7: – 8: NTC10k2 9: NTC10k3 Default: 1</p>	W
CoolingEnergyPIV_ UnitSel	PIV[31]	<p>Cooling energy in selected unit → based on selection in MV[125] See also MV[200]</p>	0...2'147'483'647	R
HeatingEnergyPIV_ UnitSel	PIV[32]	<p>Heating energy in selected unit → based on selection in MV[125] See also MV[200]</p>	0...2'147'483'647	R
VolumePIV_ UnitSel	PIV[50]	<p>Accumulated volume in selected unit → based on selection in MV[126] See also MV[200]</p>	0...2'147'483'647	R
MeterSerialNo_ Part1	PIV[201]	Energy meter serial number first digits	–	R
MeterSerialNo_ Part2	PIV[202]	Energy meter serial number last digits	–	R

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

Note: According to the present configuration settings of the Energy Valve (e.g. DN size) the HVAC application may perform a size limitation within the indicated BACnet value range.
Each Energy Valve may have different HVAC value size limitations.

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



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