BACnet Interface Description

2-way EPIV
Electronic pressure-independent characterized control valve

Edition 2023-03 / V4.0

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Contents

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Protocol Implementation Conformance Statement — PICS

General information

Date	15.12.2022
Vendor Name	BELIMO Automation AG
Vendor ID	423
Product Name	2-way EPIV
Product Model Number	EP…R2+BAC
Application Software Version	EPIV 4.0
Firmware Revision	14.10.0002
BACnet Protocol Revision	14
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

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

Parametrisation

Tool	Belimo Assistant App

⚠ All writeable objects 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 Value [MV]	Description State Text	Present Value
Positve 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.
(8 hours) are supported.

BACnet object description

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
Device	Device [Inst.No]	-	0...4'194'302 Default: 1	-	W
SpRel	AO[1]	**Relative Setpoint in %** The set point is related to either position or flow (of V'$_{min}$, V'$_{max}$) depending on control mode. -> based on selection in MV[90], MV[100] Overridden = true, if forced control (bus, tool and analog forced control) is active	0...100 Default: 0	0.01...100 Default: 1	C
RelPos	AI[1]	**Relative Position in %** Overridden = true, if gear train is disengaged	0...100	0.01...100 Default: 1	R
AbsPos	AV[2]	**Absolute Position in degrees** Overridden = true, if gear train is disengaged	0...96	0.01...96 Default: 1	R
SpAnalog	AI[6]	**Analog Setpoint in %** If SpSource 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	R
RelFlow	AI[10]	**Relative Flow in % of V$_{max}$**	0...150	0.01...150 Default: 1	R
AbsFlow_UnitSel	AI[19]	**Absolute Flow in selected unit** -> based on selection in MV[123]	0...360'000 Actual range determined by selected unit	0.001...360'000 Default: 1	R
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: 0.1	R
T_UnitSel	AI[23]	**Temperature (Flow Body) in selected unit** -> based on selection in MV[127]	-20...394 Actual range determined by selected unit	0.01...140 Default: 1	R
ErrorState	AV[140]	**Error State**	Bitmask / Bit 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: - 9: Flowbody temperature not OK 10: Communication to sensor interrupted 11: Freeze warning 12: Glycol detected 13: - 14: - 15: Bus watchdog triggered	1...65'535 Default: 1	W

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
SpAbsFlow_UnitSel	AV[17]	**Setpoint Absolute Flow in selected unit** -> based on selection in MV[123] Overridden = true, if forced control (bus, tool and analog forced control) is active	0...360'000 Actual range determined by selected unit	0.001...360'000 Default: 1	R
VolumePIV_UnitSel	PIV[50]	**Accumulated Volume in selected unit** -> based on selection in MV[126]	0...2'147'483'647 Actual range determined by selected unit	-	R
Volume_UnitSel	AV[52]	**Accumulated Volume in selected unit** -> based on selection in MV[126]	0...2'147'483'647 Actual range determined by selected unit	1...4.2E10 Default: 1	R
GlycolConcentration	AV[60]	**Glycol Concentration in %**	0...100	0.01...100 Default: 1	R
Vmin	AV[90]	**Minimum Flow Limit in %** Minimum flow limitation can be set from 2.5% of V'_{nom} to V'_{max}. Minimum flow limit deactivated if $V'_{min} = 0$.	0...V'_{max}	0.01...100 Default: 1	W
Vmin_UnitSel	AV[93]	**Minimum Flow Limit in selected unit** -> based on selection in MV[123] Minimum flow limitation can be set from 2.5% of V'_{nom} to V'_{max}. Minimum flow limit deactivated if $V'_{min} = 0$.	0...360'000 Actual range determined by selected unit	0.001...360'000 Default: 1	W
Vmax	AV[94]	**Maximum Flow Limit in %** Max. flow limitation between 25% and 100% of V'_{nom}. Values below 25% will be adjusted to 25%.	25...100 Default: 100	0.01...100 Default: 1	W
Vmax_UnitSel	AV[97]	**Maximum Flow Limit in selected unit** -> based on selection in MV[123] Max. flow limitation between 25% and 100% of V'_{nom}	0.25*V'_{nom}...V'_{nom}	0.001...360'000 Default: 1	W
Vnom_UnitSel	AV[100]	**Nominal Flow in selected unit** -> based on selection in MV[123]	0...360'000 Actual range determined by selected unit	0.001...360'000 Default: 1	R
BusWatchdog	AV[130]	**Timeout for Bus Watchdog in s**	30...3'600 Default: 120	1...3570 Default: 1	W
MeterSerialNo_Part1	PIV[201]	**Flow Meter Serial Number First Digits**	-	-	R
MeterSerialNo_Part2	PIV[202]	**Flow Meter Serial Number Last Digits**	-	-	R
Sens1Type	MV[220]	**Sensor 1 Type** Additional Sensor input. Only applicable if SpSource MV[122] is set to Bus.	1: None 2: Active Volt 3: - 4: - 5: Switch Default: 1	-	W
SummaryStatus	MV[99]	**Summary Status**	1: Ok 2: Warning 3: Not Ok	-	R

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
StatusSensor	MV[103]	**Status Sensor**	1: OK 2: Flow measurement error 3: Flowbody temperature not OK 4: - 5: Communication to flow sensor interrupted		R
StatusFlow	MV[104]	**Status Flow**	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**	1: OK 2: Glycol detected 3: Freeze warning		R
StatusActuator	MV[106]	**Status Actuator**	1: OK 2: Actuator cannot move 3: Gear disengaged 4: No communication to actuator		R
Override	MV[1]	**Override Control** Override Minimum and Maximum correspond to position or flow based on selected control mode. -> based on selection in MV[100]	1: None 2: Open Valve 3: Close Valve 4: Minimum 5: - 6: Maximum	7: Nominal 8: - 9: - 10: - 11: Motor Stop Default: 1	W
ControlMode	MV[100]	**Control Mode**	1: Position Control 2: Flow Control Default: 2		W
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**	1: Analog 2: Bus Default: 2		W
UnitSelFlow	MV[123]	**Unit Selection Flow**	1: m³/s 2: m³/h 3: l/s 4: l/min	5: l/h 6: gpm 7: cfm Default: 5	W
UnitSelVolume	MV[126]	**Unit Selection Volume**	1: m³ 2: Litre 3: Gallon	4: Cubic foot Default: 1	W
UnitSelTemperature	MV[127]	**Unit Selection Temperature Sensors**	1: Degree C 2: K 3: Degree F	Default: 1	W
BusFailAction	MV[130]	**Bus Watchdog Fail Action**	1: None 2: Open 3: Close 4: Max	5: Min 6: - 7: Stop Default: 1	W

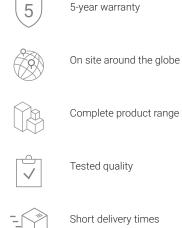Access: R = Read, W = Write, C = Commandable with priority array

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	5-year warranty
	On site around the globe
	Complete product range
	Tested quality
	Short delivery times
	Comprehensive support

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