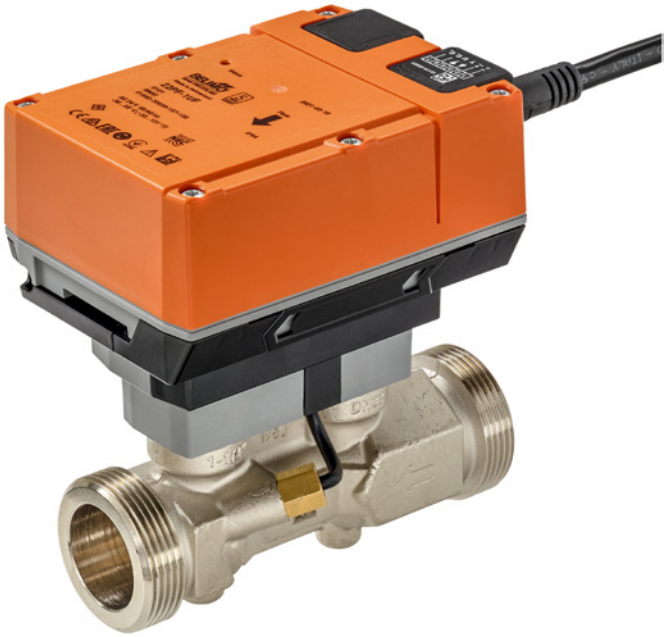

BACnet Interface Description

Flow Sensor 22PF-1U..

Edition 2025-10/ V4.2

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PICS
Protocol Implementation Conformance Statement

General information

Date	15/12/2022
Vendor Name	BELIMO Automation AG
Vendor ID	423
Product Name	Flow Sensor
Product Model Number	22PF-x1(X)Ux2(x3(x4))-(SG) x1: 1, 5 x2: C, D, E, F, G, H, H x3: H, N, K x4: H, T
Application Software Version	FM V4.0
Firmware Revision	14.10.0002
BACnet Protocol Revision	14
Product Description	Flow sensor
BACnet Standard Device Profile	BACnet Application Specific Controller (B-ASC)
Segmentation Capability	No
Data Link Layer Options	MS/TP Manager
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

Configuration

Tool	Belimo Assistant 2

All writeable objects which are persistent are **not** supposed to be written on a regular basis. Designated data points are highlighted in colour in the document.

Object processing

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...30)
Analog Input [AI]	Description COV Increment	COV Increment
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 Value [MV]	Description State Text	Present Value
Position 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 Flow Sensor.

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
Device_Name	Device [Inst.No]	BACnet internetwork-wide unique number for device identification.	0...4'194'302 Default: 1	–	R
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

Flow

These objects can be used to configure and read values related to Flow control.

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
RelFlow	AV[10]	**Relative volumetric flow in %** Related to AV[100]: FS (full scale) 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 data sheet). →► Unit can be selected by MV[123]: Unit selection volumetric flow	0...0.015 m^3/s 0...56.750 m^3/h 0...15.762 l/s 0...945.832 l/min 0...56'750.000 l /h 0...249.862 gpm 0...33.400 cfm	0.001...360'000 Default: 1	R
FS_UnitSel	AV[100]	**FS (full scale) in selected unit** Nominal volumetric flow →► Unit can be selected by MV[123]: Unit selection volumetric flow	0...0.006 m^3/s 0...22.700 m^3/h 0...6.305 l/s 0...378.333 l/min 0...22'700.000 l/h 0...99.945 gpm 0...13.360 cfm	0.001...360'000 Default: 1	R
UnitSelFlow	MV[123]	**Unit selection volumetric flow** The selected unit is valid for: AV[19]: Absolute volumetric flow in selected unit AV[100]: FS (full scale) in selected unit	1: m^3/s 2: m^3/h 3: l/s 4: l/min 5: l/h 6: gpm 7: cfm 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** (cannot be reset) →► 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 PIV[52]: Accumulated volume in selected unit	1: m^3 2: Litre 3: Gallon 4: Cubic Foot Default: 1	–	R / W

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
StatusSensor	MV[103]	**Status sensor** Indicates information within the flow sensor and temperature sensor 2: Air in the system, error occured 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: - 4: - 5: Reverse flow is 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: – 4: – 5: Reverse flow	–	R
StatusMedia	MV[105]	**Status media** 2: Medium contains glycol. 3: Measured temperature and glycol concentration indicate 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

Access definition: R = Read, W = Write

Note: According to the present configuration settings of the product (e.g. DN size), the HVAC application may perform a size limitation within the indicated BACnet value range..

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 sensor.	-20...150°C 253.15...423.15 K -4...302°F	0.01...140 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] Sensor 1 Type is not 2: Active, then Out_Of_Service is TRUE.	0...15	0.01...15 Default: 1	R
Sens1Switch	BI[20]	**Sensor 1 as switch** If MV[220] Sensor 1 type 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: Degree C 2: K 3: Degree F Default: 1	–	R / W
Sens1Type	MV[220]	**Sensor 1 type** Additional sensor input	1: None 2: Active volt 3: – 4: – 5: Switch Default: 1	–	R / W

Access definition: R = Read, W = Write

Note: According to the present configuration settings of the product (e.g. DN size), the HVAC application may perform a size limitation within the indicated BACnet value range.

Health state

This object allows to determine malfunctions, service information and error state of the Flow Sensor.

Object name	Object type [Instance]	Description Comment Status_Flags	Values	COV increment	Access
ErrorState	AV[140]	**Error state** Value is bit-coded. More than one bit can be set to 1. Not all bits mentioned are used for this product range. 3: Reverse flow is detected. Pump pressure too low; high resistance in the flow circuit; flushing bypass open 6: Actual flow exceeds the designed nominal flow. 7: Air in the system, error occured during flow measurement. Water contamination, not specified fluid used. 9: Error with embedded temperature sensor 11: Measured temperature and glycol concentration indicate that grease ice can build up 12: Medium contains glycol.	Bitmask = 0: – 1: – 2: – 3: Reverse flow 4: – 5: – 6: Flow actual exceeds flow nominal 7: Flow measurement error 8: – 9: Flowbody temperature error 10: – 11: Freeze warning 12: Glycol detected 13: – 14: – 15: –	1...65'535 Default: 0	R
SummaryStatus	MV[99]	**Summary status** Summarizes all status: MV[103]: Status sensor MV[104]: Status flow MV[105]: Status media	1: OK 2: Warning 3: Not OK	–	R

Access definition: R = Read, W = Write

Note: According to the present configuration settings of the product (e.g. DN size), the HVAC application may perform a size limitation within the indicated BACnet value range.

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

EN – 2025-10/C – Subject to technical modifications

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