

BACnet Interface Description



ZoneEase VAV VAV zone control actuator

Edition 2023-11 / V1.7



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Protocol Implementation Conformance Statement – PICS

General information

Date	11.07.2023
Vendor Name	BELIMO Automation AG
Vendor ID	423
Product Name	ZoneEase VAV
Product Model Number	LMV-BAC-., NMV-BAC-..
Application Software Version	ZoneEase 1.7
Firmware Revision	BTL:0001 B:0002
BACnet Protocol Revision	14
Product Description	VAV zone control actuator
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	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

Parametrisation

Tool	Belimo ZoneEase VAV App (for Android only)
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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 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 5 active COV subscriptions with a lifetime of 1...28'800 s (8 hours) are supported.

BACnet object descriptions – in alphabetical order

This interface description is arranged in two parts. The first part provides an overview of all supported BACnet objects listed according to object type in the following order: Analog Input [AI], Analog Output [AO], Analog Value [AV], Binary Input [BI], Binary Value [BV], Multi-state Input [MI], Multi-state Output [MO] and Multi-state Value [MV].

In the second part, the same BACnet objects are listed in the following groups: "Application parameters and diagnostics", "Room operating unit values", "VAV values" and "Device information".

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
Device	Device [Inst.No]	–	0...4'194'302 Default: 1	–	W
RelPosDmp	AI[1]	Relative damper position in %	0...100	0.01...100 Default: 1	R
AbsPosDmp	AI[2]	Absolute damper position in °	0...95	0.01...95 Default: 1	R
RelativeHumdity	AI[3]	Room relative humidity in %	0...100	0.01...100 Default: 1	R
RelPosValve	AI[7]	Relative position of reheat valve in % No feedback in case on/off valve is connected	0...100	0.01...100 Default: 1	R
RelAirFlow	AI[10]	Relative airflow in % based on V'_{nom}	0...100	0.01...100 Default: 1	R
AbsAirFlow_m3h	AI[12]	Absolute airflow in m³/h	0...99'999	0.01...99'999 Default: 1	R
AbsAirFlow_cfm	AI[13]	Absolute airflow in cfm	0...99'999	0.01...99'999 Default: 1	R
RelPosDmpSec	AI[15]	Relative damper position in % of secondary damper	0...100	0.01...100 Default: 1	R
RelAirFlowSec	AI[16]	Relative airflow in % of secondary damper	0...100	1...100 Default: 1	R
AbsAirFlow_UnitSel	AI[19]	Absolute airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.01...2 Default: 1	R
RmT_C	AI[20]	Room temperature in °C	0...40	0.01...40 Default: 1	R
RmT_F	AI[21]	Room temperature in °F	–	–	R
RmT_UnitSel	AI[23]	Room temperature in selected unit → based on selection in MV[128]	Actual range determined by selected unit	–	R
DeltaP_Pa	AI[29]	Differential pressure in Pa	-20...500	0.1...520 Default: 1	R
CO2Concentration	AI[61]	CO₂ concentration in ppm	0...9'000	1...9'000 Default: 10	R
SpAbsAirFlow_UnitSel	AI[110]	Setpoint absolute airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.01...2 Default: 1	R
OverrideValue	AO[10]	Setpoint in override mode If override MO[1] is set to an override setpoint type between 8 and 13, then the setpoint is defined with this object.	0...99'999	0.1...99'999 Default: 0	W
BoostModeTime	AV[1]	Boost mode time in min Automatically disabled if the target room temperature setpoint value is reached sooner than in 10 minutes.	0...300	0.1...300 Default: 100	W
EcoModeHeatSpShift	AV[2]	Eco mode heating setpoint shift in °C Lowers the heating setpoint (decrease of temperature setpoint) while Eco mode is activated to save energy.	0...8 Default: 4	0.1...8 Default: 1	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
EcoModeCoolSpShift	AV[3]	Eco mode cooling setpoint shift in °C Lowers the cooling setpoint (increase of temperature setpoint) while Eco mode is activated to save energy.	0...8 Default: 4	0.1...8 Default: 1	W
AbsAirFlowSec	AV[17]	Absolute airflow in m³/h of secondary damper	0...99'999	0.01...99'999 Default: 1	R
AbsAirFlowSec_UnitSel	AV[18]	Absolute airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	0.01...99'999 Default: 1	R
SpRelAirFlowSec	AV[20]	Setpoint relative airflow in % of secondary damper Resulting setpoint command from primary ZoneEase VAV actuator to the secondary damper as relative setpoint, related to calibrated V' _{nom} in the range between configured V' _{min} to V' _{max} . The resulting setpoint results from internal calculation inside the running application sequence.	0...100	0.01...100 Default: 1	R
TempCtrlPBand	AV[31]	Temperature controller P-Band Proportional gain of the temperature control loop	0...100 Default: 2	0.01...100 Default: 1	W
TempCtrlTn	AV[32]	Temperature controller integral time in s Integral time Ki of the temperature control loop	0...3'600 Default: 600	1...3'600 Default: 1	W
DeadbandTemp	AV[33]	Deadband temperature in °C Deadband of the temperature control loop	0.1...5 Default: 1	0.1...4.9 Default: 1	W
CO2CtrlPBand	AV[34]	CO₂ controller P-Band (CO₂ App only) Proportional gain of the CO ₂ control loop	0...1'000 Default: 0	1...1'000 Default: 1	W
CO2CtrlTn	AV[35]	CO₂ controller integral time in s (CO₂ App only) Integral time Ki of the CO ₂ control loop	0...3'600 Default: 600	1...3'600 Default: 1	W
DeadbandCO2	AV[36]	Deadband CO₂ in ppm (CO₂ App only) Deadband of the CO ₂ control loop	0...500 Default: 100	1...500 Default: 1	W
HysteresisFan	AV[80]	Hysteresis aggregate fan in % Hysteresis of the parallel fan	5...30	0.01...25 Default: 1	W
HysteresisElHeater1	AV[81]	Hysteresis aggregate electrical heater 1 in % Hysteresis of the electrical reheat aggregate 1	0...20	0.01...20 Default: 1	W
HysteresisElHeater2	AV[82]	Hysteresis aggregate electrical heater 2 in % Hysteresis of the electrical reheat aggregate 2	0...20	0.01...20 Default: 1	W
AggregateStart	AV[83]	Aggregate start value in % Start value of the electrical reheat aggregate	0...20	0.0...20 Default: 10	W
SpRmTHL_C	AV[84]	High limit for room temperature setpoint in °C Configures the temperature setpoint range to upper limit regarding room users setpoint selection at room operating unit.	21...30	0.1...9 Default: 1	W
SpRmTLL_C	AV[85]	Low limit for room temperature setpoint in °C Configures the temperature setpoint range to lower limit regarding room users setpoint selection at room operating unit.	10...20	0.1...10 Default: 1	W
Vmin_m3h	AV[86]	Minimum airflow in m³/h	0...99'999	0.1...99'999 Default: 100	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
VmaxC_m3h	AV[87]	Maximum cooling airflow in m³/h	0...99'999	0.1...99'999 Default: 100	W
Vmin_UnitSel	AV[88]	Minimum airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.01...99'999 Default: 100	W
VmaxC_UnitSel	AV[89]	Maximum cooling airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.01...99'999 Default: 100	W
Vmin_cfm	AV[90]	Minimum airflow in cfm	0...58'857	0.1...58'857 Default: 100	W
VmaxC_cfm	AV[91]	Maximum cooling airflow in cfm	0...58'857	0.1...58'857 Default: 100	W
VmaxH_m3/h	AV[93]	Maximum heating airflow in m³/h	0...99'999	0.1...99'999 Default: 100	W
VmaxH_UnitSel	AV[94]	Maximum heating airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.1...99'999 Default: 100	W
VmaxH_cfm	AV[95]	Maximum heating airflow in cfm	0...58'857	0.1...58'857 Default: 100	W
SpAbsVAVAirFlow_m3h	AV[102]	Setpoint absolute airflow in m³/h (VAV App only) Available for application #9 in MV[2]	0...99'999	0.01...99'999 Default: 100	W
SpAbsVAVAirFlow_cfm	AV[103]	Setpoint absolute airflow in cfm (VAV App only) Available for application #9 in MV[2]	0...99'999	0.01...99'999 Default: 100	W
SpAbsVAVAirFlow_UnitSel	AV[104]	Setpoint absolute airflow in selected unit (VAV App only) Available for application #9 in MV[2] → based on selection in MV[121]	Actual range determined by selected unit	–	W
SpRmT_C	AV[108]	Room temperature setpoint in °C	Default: 22	–	W
SpRmT_F	AV[109]	Room temperature setpoint in °F	–	–	W
SpRmT_UnitSel	AV[110]	Room temperature setpoint in selected unit → based on selection in MV[128]	Actual range determined by selected unit	–	W
SpCO2	AV[111]	CO₂ setpoint in ppm (CO₂ App only)	0...2'000 Default: 1'000	1...2'000 Default: 1	W
Vnom_m3h	AV[112]	Nominal airflow in m³/h	0...99'999	0.1...99'999 Default: 100	R
Vnom_cfm	AV[113]	Nominal airflow in cfm	0...58'899	0.1...58'899 Default: 100	R
AirQualityGoodLimit	AV[115]	CO₂ limit for good air quality in ppm CO ₂ limit for good air quality for LED indicator of the room operating unit	600...1'249 Default: 1'000	1...649 Default: 1	W
AirQualityMediumLimit	AV[116]	CO₂ limit for moderate air quality in ppm CO ₂ limit for moderate air quality for LED indicator of the room operating unit	1'250...2'000 Default: 1'500	1...750 Default: 1	W
FlowGainSec	AV[117]	Airflow gain of secondary damper Balancing of under- and overpressure between supply and secondary air damper	0...2 Default: 1	0.01...2 Default: 0.1	W
Vnom_UnitSel	AV[119]	Nominal airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	–	R
VnomSec_m3h	AV[120]	Nominal airflow in m³/h of secondary damper	0...99'999	0.1...99'999 Default: 10	R

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
VnomSec_UnitSel	AV[121]	Nominal airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	–	R
VmaxSec_m3h	AV[122]	Maximum airflow in m³/h of secondary damper	0...99'999	0.1...99'999 Default: 10	R
VmaxSec_UnitSel	AV[123]	Maximum airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	1...99'999 Default: 1.0	R
VminSec_m3h	AV[124]	Minimum airflow in m³/h of secondary damper	0...99'999	0.1...99'999 Default: 1	R
VminSec_UnitSel	AV[125]	Minimum airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	0.1...99'999 Default: 1.0	R
SetFlowCutOffPressure Value	AV[128]	Set flow cut off pressure value Differential pressure zero-point cut off value in Pa	1...5	0.1...4 Default: 0.1	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 Watchdog fail action).	5...3'600 Default: 120	1...3'570 Default: 1	W
TrunkNoCloud	AV[200]	BACnet trunk number cloud The trunk number identifies the MS/TP network where the device is installed. This information is synchronized with the digital twin and allows detection of a MAC address collision during commissioning.	0...9'999 Default: 1	1...9'998 Default: 0.1	W
FrostModeState	BI[4]	Frost mode state	0: Inactive 1: Active	–	R
DigitalInputStatus	BI[5]	Digital Input status Status of the digital input of the room operating unit	0: Inactive 1: Active Default: 0	–	R
HighCutState	BI[6]	High cut state In activated state, the connected reheat aggregate inside the VAV box will be monitored in terms of safety function. 1: Digital input at room unit shows reheat state 2: Analog input at ZoneEase VAV actuator, used as digital input (normally closed) supervises reheat aggregate emergency switch-off.	0: Inactive 1: Active Default: 0	–	R
Heater1State	BI[10]	Electrical heater 1 / on-off valve state	0: Off 1: On	–	R
Heater2State	BI[11]	Electrical heater 2 state	0: Off 1: On	–	R
FanState	BI[12]	Fan state	0: Off 1: On	–	R
RmOccupState	BI[15]	Presence sensor state	0: Not occupied 1: Occupied	–	R
BMS Changeover	BV[1]	BMS heating/cooling changeover Information from BMS if warm or cold air is supplied by the ventilation system. Available for all applications in MV[2] except for applications #2, #8 and #9	0: Cooling 1: Heating Default: 0	–	W
RUOpRights	BV[2]	Room unit operating rights	0: Room unit access disabled 1: Room unit access enabled Default: 1	–	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
OpStateSec	BV[3]	Operating state of secondary damper Shows if setpoint of the secondary damper has been reached	0: Setpoint not reached 1: Setpoint reached	–	R
SyncPos	BV[10]	Position for sync. Defines synchronization position of damper	0: 0% (damper closed) 1: 100% (damper open) Default: 1	–	W
SyncStart	BV[11]	Start sync. procedure	0: No sync. 1: Start sync. Default: 0	–	W
OccupSensEn	BV[13]	Enable occupancy sensor If an occupancy sensor is connected and enabled, the system mode MV[1] will toggle between Active and Eco.	0: Disabled 1: Enabled Default: 0	–	W
OffModeDmpPos	BV[21]	Off mode damper position	0: Damper closed 1: Damper controlled to V'_{min} Default: 1	–	W
ColorScheme	BV[111]	Light/dark color scheme Sets the display background color of the room operating unit to white (0) or black (1).	0: Black on white 1: White on black Default: 0	–	W
EnFlowCutOff	BV[117]	Enable flow cut off If enabled, the unit will suppress airflow feedback in closed damper condition (creep flow suppression).	0: Disabled 1: Enabled Default: 0	–	W
ShowAirQualityIndication	BV[125]	Air quality indication Enables the air quality LED indication on the room operating unit	0: Disabled 1: Enabled Default: 1	–	w
ROUDisplaySensorValues	BV[127]	Display sensor values on room operating unit Shows values of available sensors on room operating unit	0: Invisible 1: Visible Default: 1	–	w
EnSec	BV[128]	Enable secondary damper	0: Disabled 1: Enabled Default: 0	–	w
StatusSystem	MI[101]	Status VAV standalone system Information about the health state of the system	1: System OK 2: Invalid application 3: Room temp. sensor broken 4: Room temp. out of range 5: Deadband temp. not reached 6: AI sensor error 7: AI sensor value out of range 8: Deadband CO ₂ not reached 9: V'_{min} invalid 10: CtrlRefVal	–	w
StatusActuator	MI[106]	Status actuator	1: Actuator OK 2: Adaptation in progress 3: Sync. in progress 4: Motor stop 5: Actuator setpoint position cannot be reached (error) 6: Flow with closed damper position 7: Actuator setpoint position cannot be reached (warning)	–	R

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
StatusMPBus	MI[108]	Status MP-Bus and devices	1: MP-Bus OK 2: MP-Bus not alive 3: MP-Bus room unit/ceiling unit not alive 4: MP-Bus I/O module not alive 5: MP-Bus reheat valve not alive 6: MP-Bus secondary damper not alive	–	R
StatusPressure	MI[109]	Status dp sensor and duct pressure	1: Pressure OK 2: dp sensor broken 3: dp sensor out of range 4: dp sensor connected incorrectly or back flow detected 5: Insufficient pressure	–	R
Override	MO[1]	Override control (override control value as AO) If an override control setpoint type between 8 and 13, then the setpoint can be specified with OverrideValue AO[10].	1: None 2: Open damper 3: Close damper 4: Airflow V' _{max} 5: Airflow V' _{min} 6: Airflow V' _{nom} 7: MotorStop 8: Pos. damper in % 9: Airflow in % 10: Airflow in m ³ /h 11: – 12: Temp. SP in °C 13: CO ₂ SP in ppm Default: 1	–	W
SystemMode	MV[1]	System mode Four system modes are supported: 1. Off: An energy saving mode, e.g. during holidays 2. Active: Standard operating mode 3. Eco: An energy saving mode, e.g. room is unoccupied, at night time or weekends 4. Boost: Mode to quickly reach the target room temperature	1: Off 2: Active 3: Eco 4: Boost Default: 2	–	W
ApplicationSel	MV[2]	Application selection VAV zone control applications Room temperature control 2: Cooling only 3: Cooling or heating (changeover) 4: Cooling + 1-stage electric reheat 5: Cooling + 2-stage electric reheat 6: Cooling + on/off hydronic reheat 7: Cooling + modulating hydronic reheat Basic applications 8: Indoor air quality control 9: Air volume flow control Parallel fan and room temperature control 10: Cooling only 11: Cooling + 1-stage electric reheat 12: Cooling + 2-stage electric reheat 13: Cooling + on/off hydronic reheat 14: Cooling + modulating hydronic reheat Series fan and temperature control 15: Cooling only 16: Cooling or heating (changeover) 17: Cooling + 1-stage electric reheat 18: Cooling + 2-stage electric reheat 19: Cooling + on/off hydronic reheat 20: Cooling + modulating hydronic reheat	1: none 2: c 3: c/h 4: c+el-rh1 5: c+el-rh2 6: c+on/off-rh 7: c+mod-rh 8: CO ₂ 9: VAV 10: c+p-f 11: c+p-f+el-rh1 12: c+p-f+el-rh2 13: c+p-f+on/off-rh 14: c+p-f+mod-rh 15: c+s-f 16: c/h+s-f 17: c+s-f+el-rh1 18: c+s-f+el-rh2 19: c+s-f+on/off-rh 20: c+s-f+mod-rh Default: 1	–	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
PowerOnMode	MV[3]	Power On mode	1: No action 2: Synchronization 3: Adaptation Default: 2	–	W
RUDisplaySet	MV[4]	Display setting for room unit Relevant for room units type 22RT-A00.. BV[127] for other room unit types	1: Room temp. and setpoint display 2: Setpoint display only 3: Room temperature only Default: 2	–	–
ReheatEn	MV[5]	Select in which mode (heating/cooling) reheat is allowed	1: Always allowed 2: Allowed in heating mode only 3: Allowed in cooling mode only 4: Never allowed Default: 2	–	W
CtrlRefVal	MV[6]	Selection of reference values for VAV control This value defines the interpretation of the setpoint.	1: Temperature only 2: Temperature and CO ₂ analog input 3: Temperature and CO ₂ room operating unit Default: 1	–	W
UnitSelAirFlow	MV[121]	Unit selection airflow	1: m ³ /h 2: l/s 3: cfm Default: 1	–	W
UnitSelTemp	MV[128]	Unit selection temperature	1: K 2: °C 3: °F Default: 2	–	W
BusFailAction	MV[130]	Bus Watchdog fail action In the event of a breakdown in communication, the actuator enables the bus fail action.	1: None 2: Open 3: Close 4: Max 5: Min 6: – 7: Stop Default: 1	–	W

Definition Access: R = Read, W = Write

BACnet object descriptions – grouped

Application parameters and diagnostics

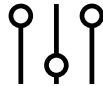


Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
EcoModeHeatSpShift	AV[2]	Eco mode heating setpoint shift in °C Lowers the heating setpoint (decrease of temperature setpoint) while Eco mode is activated to save energy.	0...8 Default: 4	0.1...8 Default: 1	W
EcoModeCoolSpShift	AV[3]	Eco mode cooling setpoint shift in °C Lowers the cooling setpoint (increase of temperature setpoint) while Eco mode is activated mode to save energy.	0...8 Default: 4	0.1...8 Default: 1	W
TempCtrlPBand	AV[31]	Temperature controller P-Band Proportional gain of the temperature control loop	0...100 Default: 2	0.01...100 Default: 1	W
TempCtrlTn	AV[32]	Temperature controller integral time in s Integral time Ki of the temperature control loop	0...3'600 Default: 600	1...3'600 Default: 1	W
DeadbandTemp	AV[33]	Deadband temperature in °C Deadband of the temperature control loop	0.1...5 Default: 1	0.1...4.9 Default: 1	W
CO2CtrlPBand	AV[34]	CO₂ controller P-Band (CO₂ App only) Proportional gain of the CO ₂ control loop	0...1'000 Default: 0	1...1'000 Default: 1	W
CO2CtrlTn	AV[35]	CO₂ controller integral time in s (CO₂ App only) Integral time Ki of the CO ₂ control loop	0...3'600 Default: 600	1...3'600 Default: 1	W
DeadbandCO2	AV[36]	Deadband CO₂ in ppm (CO₂ App only) Deadband of the CO ₂ control loop	0...500 Default: 100	1...500 Default: 1	W
CO2Concentration	AI[61]	CO₂ concentration in ppm	0...9'000	1...9'000 Default: 10	R
HysteresisFan	AV[80]	Hysteresis aggregate fan in % Hysteresis of the parallel fan	5...30	0.01...25 Default: 1	W
HysteresisElHeater1	AV[81]	Hysteresis aggregate electrical heater 1 in % Hysteresis of the electrical reheat aggregate 1	0...20	0.01...20 Default: 1	W
HysteresisElHeater2	AV[82]	Hysteresis aggregate electrical heater 2 in % Hysteresis of the electrical reheat aggregate 2	0...20	0.01...20 Default: 1	W
AggregateStart	AV[83]	Aggregate start value in % Start value of the electrical reheat aggregate	0...20	0.0...20 Default: 10	W
TrunkNoCloud	AV[200]	BACnet trunk number cloud The trunk number identifies the MS/TP network where the device is installed. This information is synchronized with the digital twin and allows detection of a MAC address collision during commissioning.	0...9'999 Default: 1	1...9'998 Default: 0.1	W
FrostModeState	BI[4]	Frost mode state	0: Inactive 1: Active	–	R
HighCutState	BI[6]	High cut state In activated state, the connected reheat aggregate inside the VAV box will be monitored in terms of safety function. 1: Digital input at room unit shows reheat state 2: Analog input at ZoneEase VAV actuator, used as digital input (normally closed) supervises reheat aggregate emergency switch-off.	0: Inactive 1: Active Default: 0	–	R
Heater1State	BI[10]	Electrical heater 1 / on-off valve state	0: Off 1: On	–	R

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
Heater2State	BI[11]	Electrical heater 2 state	0: Off 1: On	–	R
FanState	BI[12]	Fan state	0: Off 1: On	–	R
BMS Changeover	BV[1]	BMS heating/cooling changeover Information from BMS if warm or cold air is supplied by the ventilation system. Available for all applications in MV[2] except for applications #2, #8 and #9	0: Cooling 1: Heating Default: 0	–	W
SyncPos	BV[10]	Position for sync. Defines synchronization position of damper	0: 0% (damper closed) 1: 100% (damper open) Default: 1	–	W
SyncStart	BV[11]	Start sync. procedure	0: No sync. 1: Start sync. Default: 0	–	W
OccupSensEn	BV[13]	Enable occupancy sensor If an occupancy sensor is connected and enabled, the system mode MV[1] will toggle between Active and Eco.	0: Disabled 1: Enabled Default: 0	–	W
EnFlowCutOff	BV[117]	Enable flow cut off If enabled, the unit will suppress airflow feedback in closed damper condition (creep flow suppression).	0: Disabled 1: Enabled Default: 0	–	W
ApplicationSel	MV[2]	Application selection VAV zone control applications	1: none	–	W
		Room temperature control	2: Cooling only 3: Cooling or heating (changeover) 4: Cooling + 1-stage electric reheat 5: Cooling + 2-stage electric reheat 6: Cooling + on/off hydronic reheat 7: Cooling + modulating hydronic reheat		
		Basic applications	8: Indoor air quality control 9: Air volume flow control	8: CO ₂ 9: VAV	
		Parallel fan and room temperature control	10: Cooling only 11: Cooling + 1-stage electric reheat 12: Cooling + 2-stage electric reheat 13: Cooling + on/off hydronic reheat 14: Cooling + modulating hydronic reheat	10: c+p-f 11: c+p-f+el-rh1 12: c+p-f+el-rh2 13: c+p-f+on/off-rh 14: c+p-f+mod-rh	
		Series fan and temperature control	15: Cooling only 16: Cooling or heating (changeover) 17: Cooling + 1-stage electric reheat 18: Cooling + 2-stage electric reheat 19: Cooling + on/off hydronic reheat 20: Cooling + modulating hydronic reheat	15: c+s-f 16: c/h+s-f 17: c+s-f+el-rh1 18: c+s-f+el-rh2 19: c+s-f+on/off-rh 20: c+s-f+mod-rh	
			Default: 1		

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
PowerOnMode	MV[3]	Power on mode	1: No action 2: Synchronization 3: Adaptation Default: 2	–	W
ReheatEn	MV[5]	Select in which mode (heating/cooling) reheat is allowed	1: Always allowed 2: Allowed in heating mode only 3: Allowed in cooling mode only 4: Never allowed Default: 2	–	W
CtrlRefVal	MV[6]	Selection of reference values for VAV control This value defines the interpretation of the setpoint.	1: Temperature only 2: Temperature and CO ₂ analog input 3: Temperature and CO ₂ room operating unit Default: 1	–	W
UnitSelAirFlow	MV[121]	Unit selection airflow	1: m ³ /h 2: l/s 3: cfm Default: 1	–	W
UnitSelTemp	MV[128]	Unit selection temperature	1: K 2: °C 3: °F Default: 2	–	W
BusFailAction	MV[130]	Bus Watchdog fail action In the event of a breakdown in communication, the actuator enables the bus fail action.	1: None 2: Open 3: Close 4: Max 5: Min 6: – 7: Stop Default: 1	–	W

Room operating unit values



Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
RelativeHumidity	AI[3]	Room relative humidity in %	0...100	0.01...100 Default: 1	R
RmT_C	AI[20]	Room temperature in °C	0...40	0.01...40 Default: 1	R
RmT_F	AI[21]	Room temperature in °F	–	–	R
RmT_UnitSel	AI[23]	Room temperature in selected unit → based on selection in MV[128]	Actual range determined by selected unit	–	R
BoostModeTime	AV[1]	Boost mode time in min Automatically disabled if the target room temperature setpoint value is reached sooner than in 10 minutes.	0...300	0.1...300 Default: 100	W
SpRmTLL_C	AV[85]	Low limit for room temperature setpoint in °C Configures the temperature setpoint range to lower limit regarding room users setpoint selection at room operating unit.	10...20	0.1...10 Default: 1	W
SpRmT_C	AV[108]	Room temperature setpoint in °C	Default: 22	–	W
SpRmT_F	AV[109]	Room temperature setpoint in °F	–	–	W
SpRmT_UnitSel	AV[110]	Room temperature setpoint in selected unit → based on selection in MV[128]	Actual range determined by selected unit	–	W
SpCO2	AV[111]	CO₂ setpoint in ppm (CO₂ App only)	0...2'000 Default: 1'000	1...2'000 Default: 1	W
AirQualityGoodLimit	AV[115]	CO₂ limit for good air quality in ppm CO ₂ limit for good air quality for LED indicator of the room operating unit	600...1'249 Default: 1'000	1...649 Default: 1	W
AirQualityMediumLimit	AV[116]	CO₂ limit for moderate air quality in ppm CO ₂ limit for moderate air quality for LED indicator of the room operating unit	1'250...2'000 Default: 1'500	1...750 Default: 1	W
DigitalInputStatus	BI[5]	Digital input status Status of the digital input of the room operating unit	0: Inactive 1: Active Default: 0	–	R
RUOpRights	BV[2]	Room unit operating rights	0: Room unit access disabled 1: Room unit access enabled Default: 1	–	W
ColorScheme	BV[111]	Light/dark color scheme Sets the display background color of the room operating unit to white (0) or black (1).	0: Black on white 1: White on black Default: 1	–	W
ShowAirQualityIndication	BV[125]	Air quality indication Enables the air quality LED indication on the room operating unit	0: Disabled 1: Enabled Default: 1	–	W
ROUDisplaySensorValues	BV[127]	Display sensor values on room operating unit Shows values of available sensors on room operating unit	0: Invisible 1: Visible Default: 1	–	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
SystemMode	MV[1]	System mode Four system modes are supported: 1. Off: An energy saving mode, e.g. during holidays 2. Active: Standard operating mode 3. Eco: An energy saving mode, e.g. room is unoccupied, at night time or weekends 4. Boost: Mode to quickly reach the target room temperature	1: Off 2: Active 3: Eco 4: Boost Default: 2	–	W
RUDisplaySet	MV[4]	Display setting for room unit Relevant for room units type 22RT-A00.. BV[127] for other room unit types	1: Room temp. and setpoint display 2: Setpoint display only 3: Room temperature only Default: 2	–	w

VAV values



Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
RelPosDmp	AI[1]	Relative damper position in %	0...100	0.01...100 Default: 1	R
AbsPosDmp	AI[2]	Absolute damper position in °	0...95	0.01...95 Default: 1	R
RelPosValve	AI[7]	Relative position of reheat valve in % No feedback in case on/off valve is connected	0...100	0.01...100 Default: 1	R
RelAirFlow	AI[10]	Relative airflow in % based on V'_{nom}	0...100	0.01...100 Default: 1	R
AbsAirFlow_m3h	AI[12]	Absolute airflow in m³/h	0...99'999	0.01...99'999 Default: 1	R
AbsAirFlow_cfm	AI[13]	Absolute airflow in cfm	0...99'999	0.01...99'999 Default: 1	R
RelPosDmpSec	AI[15]	Relative damper position in % of secondary damper	0...100	0.01...100 Default: 1	R
RelAirFlowSec	AI[16]	Relative airflow in % of secondary damper	0...100	1...100 Default: 1	R
AbsAirFlow_UnitSel	AI[19]	Absolute airflow in selected unit → based on selection in MV[121]	–	0.01...2 Default: 1	R
DeltaP_Pa	AI[29]	Differential pressure in Pa	-20...500	0.1...520 Default: 1	R
SpAbsAirFlow_UnitSel	AI[110]	Setpoint absolute airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.01...2 Default: 1	R
OverrideValue	AO[10]	Setpoint in override mode If override MO[1] is set to an override setpoint type between 8 and 13, then the setpoint is defined with this object.	0...99'999	0.1...99'999 Default: 0	W
AbsAirFlowSec	AV[17]	Absolute airflow in m³/h of secondary damper	0...99'999	0.01...99'999 Default: 1	R
AbsAirFlowSec_UnitSel	AV[18]	Absolute airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	0.01...99'999 Default: 1	R
SpRelAirFlowSec	AV[20]	Setpoint relative airflow in % of secondary damper Resulting setpoint command from primary ZoneEase VAV actuator to the secondary damper as relative setpoint, related to calibrated V'_{nom} in the range between configured V'_{min} to V'_{max} . The resulting setpoint results from internal calculation inside the running application sequence.	0...100	0.01...100 Default: 1	R
SpRmTHL_C	AV[84]	High limit for room temperature setpoint in °C Configures the temperature setpoint range to upper limit regarding room users setpoint selection at room operating unit.	21...30	0.1...9 Default: 1	W
Vmin_m3h	AV[86]	Minimum airflow in m³/h	0...99'999	0.1...99'999 Default: 100	W

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
VmaxC_m3h	AV[87]	Maximum cooling airflow in m³/h	0...99'999	0.1...99'999 Default: 100	W
Vmin_UnitSel	AV[88]	Minimum airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.01...99'999 Default: 100	W
VmaxC_UnitSel	AV[89]	Maximum cooling airflow in selected unit -> based on selection in MV[121]	Actual range determined by selected unit	0.01...99'999 Default: 100	W
Vmin_cfm	AV[90]	Minimum airflow in cfm	0...58'857	0.1...58'857 Default: 100	W
VmaxC_cfm	AV[91]	Maximum cooling airflow in cfm	0...58'857	0.1...58'857 Default: 100	W
VmaxH_m3/h	AV[93]	Maximum heating airflow in m³/h	0...99'999	0.1...99'999 Default: 100	W
VmaxH_UnitSel	AV[94]	Maximum heating airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	0.1...99'999 Default: 100	W
VmaxH_cfm	AV[95]	Maximum heating airflow in cfm	0...58'857	0.1...58'857 Default: 100	W
SpAbsVAVAirFlow_m3h	AV[102]	Setpoint absolute airflow in m³/h (VAV App only) Available for application #9 in MV[2]	0...99'999	0.01...99'999 Default: 100	W
SpAbsVAVAirFlow_cfm	AV[103]	Setpoint absolute airflow in cfm (VAV App only) Available for application #9 in MV[2]	0...99'999	0.01...99'999 Default: 100	W
SpAbsVAVAirFlow_UnitSel	AV[104]	Setpoint absolute airflow in selected unit (VAV App only) Available for application #9 in MV[2] → based on selection in MV[121]	Actual range determined by selected unit	–	W
Vnom_m3h	AV[112]	Nominal airflow in m³/h	0...99'999	0.1...99'999 Default: 100	R
FlowGainSec	AV[117]	Airflow gain of secondary damper Balancing of under- and overpressure between supply and secondary air damper	0...2 Default: 1	0.01...2 Default: 0.1	W
Vnom_UnitSel	AV[119]	Nominal airflow in selected unit → based on selection in MV[121]	Actual range determined by selected unit	–	R
VnomSec_m3h	AV[120]	Nominal airflow in m³/h of secondary damper	0...99'999	0.1...99'999 Default: 10	R
VnomSec_UnitSel	AV[121]	Nominal airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	–	R
VmaxSec_m3h	AV[122]	Maximum airflow in m³/h of secondary damper	0...99'999	0.1...99'999 Default: 10	R
VmaxSec_UnitSel	AV[123]	Maximum airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	1...99'999 Default: 1.0	R
VminSec_m3h	AV[124]	Minimum airflow in m³/h of secondary damper	0...99'999	0.1...99'999 Default: 1	R

Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
VminSec_UnitSel	AV[125]	Minimum airflow in selected unit of secondary damper → based on selection in MV[121]	Actual range determined by selected unit	0.1...99'999 Default: 1.0	R
SetFlowCutOff-PressureValue	AV[128]	Set flow cut off pressure value Differential pressure zero-point cut off value in Pa	1...5	0.1...4 Default: 0.1	
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 Watchdog fail action).	5...3'600 Default: 120	1...3'570 Default: 1	W
OpStateSec	BV[3]	Operating state of secondary damper Shows if setpoint of the secondary damper has been reached	0: Setpoint not reached 1: Setpoint reached	–	R
OffModeDmpPos	BV[21]	Off mode damper position	0: Damper closed 1: Damper controlled to V' _{min} Default: 1	–	W
EnSec	BV[128]	Enable secondary damper	0: Disabled 1: Enabled Default: 0	–	W
Override	MO[1]	Override control (override control value as AO) If an override control setpoint type between 8 and 13, then the setpoint can be specified with OverrideValue AO[10].	1: None 2: Open damper 3: Close damper 4: Airflow V' _{max} 5: Airflow V' _{min} 6: Airflow V' _{nom} 7: MotorStop 8: Pos. damper in % 9: Airflow in % 10: Airflow in m ³ /h 11: – 12: Temp. SP in °C 13: CO ₂ SP in ppm Default: 1	–	W

Device information



Object name	Object type [Instance]	Description Comment, Status_Flags	Values	COV increment	Access
StatusSystem	MI[101]	Status VAV standalone system Information about the health state of the system.	1: System OK 2: Invalid application 3: Room temp. sensor broken 4: Room temp. out of range 5: Deadband temp. not reached 6: AI sensor error 7: AI sensor value out of range 8: Deadband CO ₂ not reached 9: V _{min} invalid 10: CtrlRefVal	–	R
StatusActuator	MI[106]	Status actuator	1: Actuator OK 2: Adaptation in progress 3: Sync. in progress 4: Motor stop 5: Actuator setpoint position cannot be reached (error) 6: Flow with closed damper position 7: Actuator setpoint position cannot be reached (warning)	–	R
StatusMPBus	MI[108]	Status MP-Bus and devices	1: MP-Bus OK 2: MP-Bus not alive 3: MP-Bus room unit/ceiling unit not alive 4: MP-Bus I/O module not alive 5: MP-Bus reheat valve not alive 6: MP-Bus secondary damper not alive	–	R
StatusPressure	MI[109]	Status dp sensor and duct pressure	1: Pressure OK 2: dp sensor broken 3: dp sensor out of range 4: dp sensor connected incorrectly or back flow detected 5: Insufficient pressure	–	R

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BELIMO Automation AG

Brunnenbachstrasse 1, 8340 Hinwil, Switzerland
+41 43 843 61 11, info@belimo.ch, www.belimo.com

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