GREYSTONE
ENERGY SYSTEMS INC

CR3 Series
Cleanroom Monitor

SETUP GUIDE: BACnet® COMMUNICATION

BACnet® Specification

BACnet® Protocol

This section describes the implementation of the BACnet® protocol. It is intended to assist control system programmers who may need to add support to their systems to communicate with this device. This device communicates on standard BACnet® networks using MS/TP mode transmission. It operates as a slave device (address from 1 to 255) and expects a BACnet® master device to transmit queries, which it will answer.

Object Type	Object Identifier	Object Name	Description	Default
Device	381003	Sensor003		
Analog Input	AI 1	Temperature (TEMP)	0 to 50.0 °C or 32.0 to 122.0 °F	
	AI 2	Relative Humidity (RH)	0 to 100.0 %RH	
	AI 3	Differential Pressure (DP)	± 500 Pa or ± 50 mmWc	
	AI 4	TEMP Minimum	0 to 50.0 °C or 32.0 to 122.0 °F	
	AI 5	TEMP Maximum	0 to 50.0 °C or 32.0 to 122.0 °F	
	AI 6	RH Minimum	0 to 100.0 %RH	
	AI 7	RH Maximum	0 to 100.0 %RH	
	AI 8	DP Minimum	± 500 Pa or ± 50 mmWc	
	AI 9	DP Maximum	± 500 Pa or ± 50 mmWc	
Analog Value	AV 1	TEMP Offset	-5.0 to 5.0 Δ°C or -10 to 10 Δ°F	0 Δ°C
	AV 2	RH Offset	-10 to 10 %RH	0 %RH
	AV 3	TEMP Alarm Low Setpoint	TLS-min <=TALS <= TLS-max	15°C/59°F
	AV 4	TEMP Low Setpoint Min	0 to 26 °C or 32 to 79 °F	10°C/50°F
	AV 5	TEMP Low Setpoint Max	4 to 30 °C or 39 to 86 °F	22°C/72°F
	AV 6	TEMP Alarm High Setpoint	THS-min <=TAHS <= THS-max	25°C/77°F
	AV 7	TEMP High Setpoint Min	16 to 46 °C or 61 to 115 °F	20°C/68°F
	AV 8	TEMP High Setpoint Max	20 to 50 °C or 68 to 122 °F	30°C/86°F
	AV 9	TEMP Alarm Hysteresis	0.0 to 1.0 Δ°C or 0.0 to 2.0 Δ°F	0.2Δ°C/0.4Δ°F
	AV 10	TEMP Alarm On Delay	0 to 255 seconds	5 sec
	AV 11	RH Alarm Low Setpoint	RHLS-min <= RHALS <= RHLS-max	30 %RH
	AV 12	RH Low Setpoint Min	5 to 60 %RH	20 %RH
	AV 13	RH Low Setpoint Max	15 to 70 %RH	40 %RH
	AV 14	RH Alarm High Setpoint	RHHS-min <= RHAHS <= RHHS-max	65 %RH
	AV 15	RH High Setpoint Min	40 to 90 %RH	50 %RH
	AV 16	RH High Setpoint Max	50 to 100 %RH	80 %RH
	AV 17	RH Alarm Hysteresis	0 to 5 %RH	2 %RH
	AV 18	RH Alarm On Delay	0 to 255 seconds	15 sec
	AV 19	DP Alarm Low Setpoint	DPLS-min <= DPALS <= DPLS-max	0Pa/0mmWc
	AV 20	DP Low Setpoint Min	-500 to 0 Pa or -50 to 0 mmWc	-400Pa/-40mm
	AV 21	DP Low Setpoint Max	-400 to 400 Pa or -40 to 40 mmWc	200Pa/20mm
	AV 22	DP Alarm High Setpoint	DPHS-min <= DPAHS <= DPHS-max	200Pa/20mm
	AV 23	DP High Setpoint Min	-400 to 400 Pa or -40 to 40 mmWc	-100Pa/-10mm
	AV 24	DP High Setpoint Max	0 to 500 Pa or 0 to 50 mmWc	400Pa/40mm
	AV 25	DP Alarm Hysteresis	0 to 50 Pa or 0 to 5 mmWc	5Pa/0.5mmWc
	AV 26	DP Alarm On Delay	0 to 255 seconds	10 sec
	AV 27	Buzzer Auto Reset Time	5 to 255 seconds	15 sec
	AV 28	Analog Out TEMP Override	0 to 100 %	50 %
	AV 29	Analog Out RH Override	0 to 100 %	50 %
	AV 30	Analog Out DP Override	0 to 100 %	50 %
	AV 31	Digital Input Self-reset Time	1 to 255 seconds	30 sec
	AV32	DP Low Range	-500 to 0 Pa or -50 to 0 mmWc	-500Pa/-50mm
	AV33	DP High Range	0 to 500Pa or 0 to 50 mmWc	500Pa/50mm

Binary Input	BI 1	Digital Input	0 = Inactive, 1 = Active	Inactive
	BI 2	TEMP Alarm Low Status	0 = No alarm, 1 = Alarm	0
	BI 3	TEMP Alarm High Status	0 = No alarm, 1 = Alarm	0
	BI 4	RH Alarm Low Status	0 = No alarm, 1 = Alarm	0
	BI 5	RH Alarm High Status	0 = No alarm, 1 = Alarm	0
	BI 6	DP Alarm Low Status	0 = No alarm, 1 = Alarm	0
	BI 7	DP Alarm High Status	0 = No alarm, 1 = Alarm	0
Binary Value	BV 1	TEMP Units	0 = °C, 1 = °F	°C
	BV 2	DP Units	0 = Pa, 1 = mmWc	Pa
	BV 3	DP Auto Zero	0 = Normal Operation, 1 = Perform Auto Zero	0
	BV 4	TEMP Response Time	0 = Fast, 1 = Slow	Fast
	BV 5	RH Response Time	0 = Fast, 1 = Slow	Fast
	BV 6	DP Response Time	0 = Fast, 1 = Slow	Fast
	BV 7	TEMP Display	0 = Off, 1 = On	On
	BV 8	RH Display	0 = Off, 1 = On	On
	BV 9	DP Display	0 = Off, 1 = On	On
	BV 10	TEMP Out Direction	0 = Direct, 1 = Reverse	Direct
	BV 11	RH Out Direction	0 = Direct, 1 = Reverse	Direct
	BV 12	DP Out Direction	0 = Direct, 1 = Reverse	Direct
	BV 13	Analog Output Override	0 = Normal, 1 = Override	Normal
	BV 14	Buzzer Reset	0 = Manual Only, 1 = Manual + Automatic	1
	BV 15	Alarm Acknowledge	0 = Normal, 1 = Alarm Acknowledged	0
	BV 16	Digital Input Mode	0 = Latch, 1 = Momentary Self-reset	1
	BV 17	Digital Input Status	0 = Inactive, 1 = Active	Inactive
	BV 18	Setpoint Lock	0 = Not Locked, 1 = Locked	Not Locked
	BV 19	User Menu Lock	0 = Not Locked, 1 = Locked	Not Locked
	BV 20	Installer Menu Lock	0 = Not Locked, 1 = Locked	Not Locked
	BV 21	Display Brightness	0 = Low, 1 = High	High
	BV 22	TEMP Analog Input Range	0 = 0-35 °C (32-95 °F), 1 = 0-50 °C (32-122 °F)	0-50 °C
	BV 23	Analog Input Signal Type	0 = mA, 1 = Voltage	mA
	BV 24	Analog Input Volt Range	0 = 0-5 V, 1 = 0-10 V	0-5 V
	BV 25	Analog Output Signal Type	0 = mA, 1 = Voltage	mA
	BV 26	Analog Output Volt Range	0 = 0-5 V, 1 = 0-10 V	0-5 V
	BV 27	Min Max Reset	0 = Normal, 1 = Reset all values	0
Multi-State Value	MSV 1	TEMP Alarm Operation	1=Low Alrm, 2=High Alrm, 3=Both, 4=Disable	Disable
	MSV 2	RH Alarm Operation	1=Low Alrm, 2=High Alrm, 3=Both, 4=Disable	Disable
	MSV 3	DP Alarm Operation	1=Low Alrm, 2=High Alrm, 3=Both, 4=Disable	Both
	MSV 4	Buzzer Assignment	1 = TEMP, 2 = RH, 3 = DP, 4 = Disable, 5 = All	DP
	MSV 5	Digital Input Function	1 = Disable, 2 = Freeze, 3 = Silence	Disable

The BACnet Device Object allows configuration of the Sensor. Device object properties are shown below.

Property	Default Value	Property Data Type	Access
Object Identifier	381003	BACnetObjectIdentifier (numeric)	Read / Write
Object Name	Sensor003	CharacterString (32)	Read / Write
Object Type	DEVICE (8)	BACnetObjectType	Read
System Status	OPERATIONAL (0)	BACnetDeviceStatus	Read
Vendor Name	Greystone Energy Systems	CharacterString	Read
Vendor Identifier	381	Unsigned16	Read
Model Name	CR	CharacterString	Read
Firmware Revision	1.05	CharacterString	Read
Application Software Version	V1.0	CharacterString	Read
Location	150 English Dr, Moncton, NB	CharacterString (32)	Read / Write
Description	RH T DP Sensor	CharacterString (32)	Read / Write
Protocol Version	1	Unsigned	Read
Protocol Revision	14	Unsigned	Read
Protocol Services Supported	See description below	BACnetServicesSupported	Read
Protocol Object Types Supported	See description below	BACnetObjectTypesSupported	Read
Object List	See description below	BACnetArray	Read
Max APDU Length Accepted	50, B'0000'	Unsigned	Read
Segmentation Supported	NO_SEGMENTATION (3)	BACnetSegmentation	Read
APDU Timeout	6000	Unsigned	Read / Write
Number of APDU Retries	3	Unsigned	Read / Write
Max Master	127	Unsigned	Read / Write
Max Info Frames	1	Unsigned	Read
Device Address Binding	empty	BACnetAddressBinding	Read
Database Revision	0	Unsigned	Read
Property List		BACnetArray	Read

Object_Indentifier — Initial default number is 381003, where 381 is the vendor ID and 003 is the default network MAC address. When the MAC address is initially changed the value is updated and saved. For example, if the MAC address is set to 50 via the menu for startup, then the device instance will be set to 381050. This property is also writable via BACnet. If the Device:Object_Identifier is written to via BACnet then the MAC address is no longer appended to the vendor ID to create this value.

Object_Name — Initial string is "Sensor003" where 003 is the default network address. Can be written with a new string of maximum length of 32 characters and the value is saved. The "003" is the MAC address as set by the menu and is automatically changed if the MAC address is changed. Once written to via BACnet, the MAC address no longer gets appended to the value.

Protocol_Services Supported — readProperty, readPropertyMultiple, writeProperty, deviceCommunicationControl, who-Has, who-Is
Binary bit string = {00000000 00001011 01000000 00000000 01100000 0}

Protocol_Object_Types Supported — Analog_Input, Analog_Value, Binary_Input, Binary_Value, Device, MultiState_Value
Binary bit string = {10110100 10000000 00010000 0000000 00000000 00000000 0000000}

Object_List — (Device, Instance 3), (AI1..AI9), (AV1..AV33), (BI1…BI7), (BV1..BV27), (MSV1..MSV5)

APDU_Timeout — Value is 6000. Can be modified from 1 to 10,000.

Number_Of_APDU_Retries — Value is 3. Can be modified from 1 to 10.

Max_Master — Value is 127. Can be modified from 1 to 127.

Database_Revision — Value is 0 to 255.

The analog input BACnet objects allows reading of sensor input values as well as minimum and maximum values. AI object properties are shown below.

Analog Input Object **Temperature** (Present_Value is current temperature sensor reading in °C or °F, resolution is 0.1°)
(The temperature units default to °C but can be changed to °F using BV1)

Property	Default Value	Property Data Type	Access
Object Identifier	AI1 (Analog Input 1)	BACnetObjectIdentifier	Read
Object Name	Temperature	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	current reading	Real	Read
Description	Temperature	CharacterString (32)	Read
Device Type	Temperature Sensor	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: 0.0 °C <= Present_Value <= 50.0 °C
32.0 °F <= Present_Value <= 122.0 °F

Analog Input Object **Relative Humidity** (Present Value is current RH sensor reading in %RH, resolution is 0.1%)

Property	Default Value	Property Data Type	Access
Object Identifier	AI2 (Analog Input 2)	BACnetObjectIdentifier	Read
Object Name	Relative Humidity	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	current reading	Real	Read
Description	Relative Humidity	CharacterString (32)	Read
Device Type	RH Sensor	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Input Object **Differential Pressure** (Present Value is current DP sensor reading in Pa or mmWc, resolution is 1 Pa or 0.1 mmWc)

Property	Default Value	Property Data Type	Access
Object Identifier	AI3 (Analog Input 3)	BACnetObjectIdentifier	Read
Object Name	Differential Pressure	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	current reading	Real	Read
Description	Differential Pressure	CharacterString (32)	Read
Device Type	DP Sensor	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Input Object **TEMP Minimum** (Present_Value is the minimum temperature sensor reading since the last BV27 reset)

Property	Default Value	Property Data Type	Access
Object Identifier	AI4 (Analog Input 4)	BACnetObjectIdentifier	Read
Object Name	TEMP Minimum	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	minimum value of AI1	Real	Read
Description	TEMP Minimum	CharacterString (32)	Read
Device Type	Temperature Min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: Units, Resolution and Present_Value range are the same as AI1
Writing 1 to BV27 resets Present_Value to the current value of AI1

Analog Input Object (Present_Value is the maximum temperature sensor reading since the last BV27 reset)
TEMP Maximum

Property	Default Value	Property Data Type	Access
Object Identifier	AI5 (Analog Input 5)	BACnetObjectIdentifier	Read
Object Name	TEMP Maximum	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	maximum value of AI1	Real	Read
Description	TEMP Maximum	CharacterString (32)	Read
Device Type	Temperature Max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: Units, Resolution and Present_Value range are the same as AI1

Analog Input Object (Present_Value is the minimum RH sensor reading since the last BV27 reset)
RH Minimum

Property	Default Value	Property Data Type	Access
Object Identifier	AI6 (Analog Input 6)	BACnetObjectIdentifier	Read
Object Name	RH Minimum	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	minimum value of AI2	Real	Read
Description	RH Minimum	CharacterString (32)	Read
Device Type	RH Min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: Resolution and Present_Value range are the same as AI2
Writing 1 to BV27 resets Present_Value to the current value of AI2

Analog Input Object (Present_Value is the maximum RH sensor reading since the last BV27 reset)
RH Maximum

Property	Default Value	Property Data Type	Access
Object Identifier	AI7 (Analog Input 7)	BACnetObjectIdentifier	Read
Object Name	RH Maximum	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	maximum value of AI2	Real	Read

Description	RH Maximum	CharacterString (32)	Read
Device Type	RH Max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: Resolution and Present_Value range are the same as AI2
Writing 1 to BV27 resets Present_Value to the current value of AI2

Analog Input Object (Present Value is the minimum DP sensor reading since the last BV27 reset)
DP Minimum

Property	Default Value	Property Data Type	Access
Object Identifier	AI8 (Analog Input 8)	BACnetObjectIdentifier	Read
Object Name	DP Minimum	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	Minimum value of AI3	Real	Read
Description	DP Minimum	CharacterString (32)	Read
Device Type	DP Min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: Units, Resolution and Present_Value range are the same as AI3
Writing 1 to BV27 resets Present_Value to the current value of AI3

Analog Input Object (Present Value is the maximum DP sensor reading since the last BV27 reset)
DP Maximum

Property	Default Value	Property Data Type	Access
Object Identifier	AI9 (Analog Input 9)	BACnetObjectIdentifier	Read
Object Name	DP Maximum	CharacterString (32)	Read
Object Type	ANALOG_INPUT (0)	BACnetObjectType	Read
Present Value	Maximum value of AI3	Real	Read
Description	DP Maximum	CharacterString (32)	Read
Device Type	DP Max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: Units, Resolution and Present_Value range are the same as AI3
Writing 1 to BV27 resets Present_Value to the current value of AI3

The analog value BACnet Objects allow sensor calibration, alarm setpoint configuration and various parameter setting. Analog value object properties are shown below.

Analog Value Object (Present Value defaults to 0 for no offset. Can be set from –10 to +10 Δ°F or -5.0 to +5.0 Δ°C)
Temperature Offset (Units depend on the device units, either °C or °F), (°C resolution = 0.5, °F resolution = 1)

Property	Default Value	Property Data Type	Access
Object Identifier	AV1 (Analog Value 1)	BACnetObjectIdentifier	Read
Object Name	Temperature Offset	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	0	Real	Read / Write
Description	Temperature Offset	CharacterString (32)	Read

Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	delta-degrees-Fahrenheit (120) or Δ°C (121)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object (Present Value defaults to 0 for no offset. Can be set from –10 to +10 %RH, resolution = 1)
RH Offset

Property	Default Value	Property Data Type	Access
Object Identifier	AV2 (Analog Value 2)	BACnetObjectIdentifier	Read
Object Name	RH Offset	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	0	Real	Read / Write
Description	RH Offset	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object (Present Value is current value such that TLS-min <= TALS <= TLS-max)
TEMP Alarm Low Setpoint (Default value is 15.0 °C or 59.0 °F, resolution is 0.1°)

Property	Default Value	Property Data Type	Access
Object Identifier	AV3 (Analog Value 3)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm Low Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	TALS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The TALS units depend on the setting of BV1 TEMP Units. If TALS is disabled by MSV1 TEMP Alarm Operation, then the Status Flags and Event State property values change to indicate this object is not used.

Rules are enforced: TLS-min <= TALS <= TLS-max
TLS-max – TLS-min >= 4 °C or >= 7 °F
TAHS – TALS >= 2 °C or >= 4 °F

If TALS is set via the User Menu, the resolution is only 1°.

Analog Value Object (Present Value can be set from 0 to 26 °C or 32 to 79 °F, resolution is 1°)
TEMP Low Setpoint Min (Default value is 10 °C or 50 °F)

Property	Default Value	Property Data Type	Access
Object Identifier	AV4 (Analog Value 4)	BACnetObjectIdentifier	Read
Object Name	TEMP Low Setpoint Min	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	TLS-min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The TLS-min units depend on the setting of BV1 TEMP Units.

Analog Value Object (Present Value can be set from 4 to 30 °C or 39 to 86 °F, resolution is 1°)
TEMP Low Setpoint Max (Default value is 22 °C or 72 °F)

Property	Default Value	Property Data Type	Access
Object Identifier	AV5 (Analog Value 5)	BACnetObjectIdentifier	Read
Object Name	TEMP Low Setpoint Max	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	TLS-max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The TLS-max units depend on the setting of BV1 TEMP Units.
Rules are enforced: TLS-max – TLS-min >= 4 °C or >= 7 °F

Analog Value Object (Present Value is current value such that THS-min <= TAHS <= THS-max)
TEMP Alarm High Setpoint (Default value is 25 °C or 77 °F, resolution is 0.1°)

Property	Default Value	Property Data Type	Access
Object Identifier	AV6 (Analog Value 6)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm High Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	TAHS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The TAHS units depend on the setting of BV1 TEMP Units. If TAHS is disabled by MSV1 TEMP Alarm Operation, then the Status Flags and Event State property values change to indicate this object is not used.

Rules are enforced: THS-min <= TAHS <= THS-max
THS-max – THS-min >= 4 °C or >= 7 °F
TAHS – TALS >= 2 °C or >= 4 °F

If TAHS is set via the User Menu, the resolution is only 1°.

Analog Value Object (Present Value can be set from 16 to 46 °C or 61 to 115 °F, resolution is 1°)
Note: For CR3C units the max value will be determined by setting of TEMP Analog Input Range
TEMP High Setpoint Min (Default value is 20 °C or 68 °F)

Property	Default Value	Property Data Type	Access
Object Identifier	AV7 (Analog Value 7)	BACnetObjectIdentifier	Read
Object Name	TEMP High Setpoint Min	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	THS-min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The THS-min units depend on the setting of BV1 TEMP Units.

Analog Value Object (Present Value can be set from 25 to 50 °C or 68 to 122 °F, resolution is 1°)
Note: For CR3C units the max value will be determined by setting of TEMP Analog Input Range
TEMP High Setpoint Max (Default value is 30 °C or 86 °F)

Property	Default Value	Property Data Type	Access
Object Identifier	AV8 (Analog Value 8)	BACnetObjectIdentifier	Read
Object Name	TEMP High Setpoint Max	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	THS-max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	degrees-Celsius (62) or degrees-Fahrenheit (64)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The THS-max units depend on the setting of BV1 TEMP Units.

Rules are enforced: THS-max – THS-min >= 4 °C or >= 7 °F

Analog Value Object (Present Value can be set from 0.0 to 1.0 Δ°C or 0.0 to 2.0 Δ°F, resolution is 0.1°)
TEMP Alarm Hysteresis (Default value is 0.2 Δ°C or 0.4 Δ°F)

Property	Default Value	Property Data Type	Access
Object Identifier	AV9 (Analog Value 9)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm Hysteresis	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	TA-HYS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	delta-degrees-Celsius (121) or Δ°F (120)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The TA-HYS units depend on the setting of BV1 TEMP Units.
Applies to both TALS and TAHS.

Analog Value Object (Present Value can be set from 0 to 255 seconds, resolution is 1 second)
TEMP Alarm On Delay (Default value is 5 seconds)

Property	Default Value	Property Data Type	Access
Object Identifier	AV10 (Analog Value 10)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm On Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	TA-OD	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Applies to both TALS and TAHS.

Analog Value Object (Present Value is current value such that RHLS-min <= RHALS <= RHLS-max)
RH Alarm Low Setpoint (Default value is 30 %RH, resolution is 1 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV11 (Analog Value 11)	BACnetObjectIdentifier	Read
Object Name	RH Alarm Low Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHALS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

If RHALS is disabled by MSV2 RH Alarm Operation, then the Status Flags and Event State property values change to indicate this object is not used.

Rules are enforced: RHLS-min <= RHALS <= RHLS-max
RHLS-max – RHLS-min >= 10 %RH
RHAHS – RHALS >= 10 %RH

Analog Value Object (Present Value can be set from 5 to 60 %RH, resolution is 1 %RH)
RH Low Setpoint Min (Default value is 20 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV12 (Analog Value 12)	BACnetObjectIdentifier	Read
Object Name	RH Low Setpoint Min	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHLS-min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object (Present Value can be set from 15 to 70 %RH, resolution is 1 %RH)
RH Low Setpoint Max (Default value is 40 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV13 (Analog Value 13)	BACnetObjectIdentifier	Read
Object Name	RH Low Setpoint Max	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHLS-max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: RHLS-max – RHLS-min >= 10 %RH

Analog Value Object (Present Value is current value such that RHHS-min <= RHAHS <= RHHS-max)
RH Alarm High Setpoint (Default value is 65 %RH, resolution is 1 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV14 (Analog Value 14)	BACnetObjectIdentifier	Read
Object Name	RH Alarm High Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHAHS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

If RHAHS is disabled by MSV2 RH Alarm Operation, then the Status Flags and Event State property values change to indicate this object is not used.

Rules are enforced: RHHS-min <= RHAHS <= RHHS-max
RHAHS – RHALS >= 10 %RH

Analog Value Object (Present Value can be set from 40 to 90 %RH, resolution is 1 %RH)
RH High Setpoint Min (Default value is 50 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV15 (Analog Value 15)	BACnetObjectIdentifier	Read
Object Name	RH High Setpoint Min	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHHS-min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object (Present Value can be set from 50 to 100 %RH, resolution is 1 %RH)

RH High Setpoint Max (Default value is 80 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV16 (Analog Value 16)	BACnetObjectIdentifier	Read
Object Name	RH High Setpoint Max	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHHS-max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: RHHS-max – RHHS-min >= 10 %RH

Analog Value Object (Present Value can be set from 0 to 5 %RH, resolution is 1 %RH)
RH Alarm Hysteresis (Default value is 2 %RH)

Property	Default Value	Property Data Type	Access
Object Identifier	AV17 (Analog Value 17)	BACnetObjectIdentifier	Read
Object Name	RH Alarm Hysteresis	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHA-HYS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Percent-relative-humidity (29)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Applies to both RHALS and RHAHS.

Analog Value Object (Present Value can be set from 0 to 255 seconds, resolution is 1 second)
RH Alarm On Delay (Default value is 15 seconds)

Property	Default Value	Property Data Type	Access
Object Identifier	AV18 (Analog Value 18)	BACnetObjectIdentifier	Read
Object Name	RH Alarm On Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	RHA-OD	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Applies to both RHALS and RHAHS.

Analog Value Object (For Type A/B, Present Value is current value such that DPLS-min <= DPALS <= DPLS-max)
(For Type C, the rules are descripted in User Menu)

DP Alarm Low Setpoint (Default value is 0 Pa or 0 mmWc, resolution is 1 Pa or 0.1 mmWc)

Property	Default Value	Property Data Type	Access
Object Identifier	AV19 (Analog Value 19)	BACnetObjectIdentifier	Read
Object Name	DP Alarm Low Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPALS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

If DPALS is disabled by MSV3 DP Alarm Operation, then the Status Flags and Event State property values change to indicate this object is not used.

Rules are enforced: DPLS-min <= DPALS <= DPLS-max
DPLS-max – DPLS-min >= 100 Pa or >= 10 mmWc
DPAHS – DPALS >= 50 Pa or >= 5 mmWc

Analog Value Object:
(Apply Type A/B only)
Present Value can be set from -500 to 0 Pa or -50 to 0 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-02-xxx models
Present Value can be set from -250 to 0 Pa or -25 to 0 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-01-xxx models

DP Low Setpoint Min (Default value is -400 Pa or -40 mmWc for CR3x-02-xxx models)
(Default value is -200 Pa or -20 mmWc for CR3x-01-xxx models)

Property	Default Value	Property Data Type	Access
Object Identifier	AV20 (Analog Value 20)	BACnetObjectIdentifier	Read
Object Name	DP Low Setpoint Min	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPLS-min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object
(Apply Type A/B only)
Present Value can be set from -400 to 400 Pa or -40 to 40 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-02-xxx models
Present Value can be set from -150 to 200 Pa or -15 to 20 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-01-xxx models

DP Low Setpoint Max (Default value is 200 Pa or 20 mmWc for CR3x-02-xxx models)
(Default value is 100 Pa or 10 mmWc for CR3x-01-xxx models)

Property	Default Value	Property Data Type	Access

Object Identifier	AV21 (Analog Value 21)	BACnetObjectIdentifier	Read
Object Name	DP Low Setpoint Max	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPLS-max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: DPLS-max – DPLS-min >= 100 Pa or >= 10 mmWc

Analog Value Object (For Type A/B, Present Value is current value such that DPHS-min <= DPAHS <= DPHS-max)
(For Type C, the rules are descripted in User Menu)

DP Alarm High Setpoint (Default value is 200 Pa or 20 mmWc, resolution is 1 Pa or 0.1 mmWc)

Property	Default Value	Property Data Type	Access
Object Identifier	AV22 (Analog Value 22)	BACnetObjectIdentifier	Read
Object Name	DP Alarm High Setpoint	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPAHS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

If DPAHS is disabled by MSV3 DP Alarm Operation, then the Status Flags and Event State property values change to indicate this object is not used.

Rules are enforced: DPHS-min <= DPAHS <= DPHS-max
DPAHS – DPALS >= 50 Pa or >= 5 mmWc

Analog Value Object
(Apply Type A/B only) Present Value can be set from -400 to 400 Pa or -40 to 40 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-02-xxx models
Present Value can be set from -200 to 150 Pa or -20 to 15 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-01-xxx models

DP High Setpoint Min (Default value is -100 Pa or -10 mmWc for CR3x-02-xxx models)
(Default value is -50 Pa or -5 mmWc for CR3x-01-xxx models)

Property	Default Value	Property Data Type	Access
Object Identifier	AV23 (Analog Value 23)	BACnetObjectIdentifier	Read
Object Name	DP High Setpoint Min	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPHS-min	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read

Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object
(Apply Type A/B only)

Present Value can be set from 0 to 500 Pa or 0 to 50 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-02-xxx models
Present Value can be set from 0 to 250 Pa or 0 to 25 mmWc, resolution is 10 Pa or 1 mmWc for CR3x-01-xxx models

DP High Setpoint Max (Default value is 400 Pa or 40 mmWc for CR3x-02-xxx models)
(Default value is 200 Pa or 20 mmWc for CR3x-01-xxx models)

Property	Default Value	Property Data Type	Access
Object Identifier	AV24 (Analog Value 24)	BACnetObjectIdentifier	Read
Object Name	DP High Setpoint Max	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPHS-max	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Rules are enforced: DPHS-max – DPHS-min >= 50 Pa or >= 5 mmWc

Analog Value Object (For Type A/B, Present Value can be set from 0 to 50 Pa or 0 to 5 mmWc, resolution is 1 Pa or 0.1 mmWc).

For Type C
DP Alarm Hysteresis (Type C) (DPHY)

Dphy 0 to (S/10) PA (Resolution = 1 Pa or 0.1 mmWc) (Default = 5 Pa or 0.5 mmWc)
or
0.0 to (S/10) StA

DP Alarm Hysteresis (Default value is 5 Pa or 0.5 mmWc)

Property	Default Value	Property Data Type	Access
Object Identifier	AV25 (Analog Value 25)	BACnetObjectIdentifier	Read
Object Name	DP Alarm Hysteresis	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPA-HYS	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The DPA-HYS units depend on the DP Units.
Applies to both DPALS and DPAHS.

Analog Value Object (Present Value can be set from 0 to 255 seconds, resolution is 1 second)
DP Alarm On Delay (Default value is 10 seconds)

Property	Default Value	Property Data Type	Access
Object Identifier	AV26 (Analog Value 26)	BACnetObjectIdentifier	Read
Object Name	DP Alarm On Delay	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DPA-OD	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Applies to both DPALS and DPAHS.

Analog Value Object (Present Value can be set from 5 to 255 seconds, resolution is 1 second)
Buzzer Auto Reset Time (Default value is 15 seconds)

Property	Default Value	Property Data Type	Access
Object Identifier	AV27 (Analog Value 27)	BACnetObjectIdentifier	Read
Object Name	Buzzer Auto Reset Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	BUZZ-TIME	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object (Present Value can be set from 0 to 100 %, resolution is 1 %)
Analog Out TEMP Override (Default value is 50 %)

Property	Default Value	Property Data Type	Access
Object Identifier	AV28 (Analog Value 28)	BACnetObjectIdentifier	Read
Object Name	Analog Out TEMP Override	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	AO-TEMP-OR	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	percent (98)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The Analog Output TEMP Override is normally disabled unless enabled by BV13 Analog Output Override. Enable the override first, then set the 0-100 % output signal as required to test the output signal.

Analog Value Object (Present Value can be set from 0 to 100 %, resolution is 1 %)
Analog Out RH Override (Default value is 50 %)

Property	Default Value	Property Data Type	Access
Object Identifier	AV29 (Analog Value 29)	BACnetObjectIdentifier	Read
Object Name	Analog Out RH Override	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	AO-RH-OR	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	percent (98)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The Analog Output RH Override is normally disabled unless enabled by BV13 Analog Output Override. Enable the override first, then set the 0-100 % output signal as required to test the output signal.

Analog Value Object (Present Value can be set from 0 to 100 %, resolution is 1 %)
Analog Out DP Override (Default value is 50 %)

Property	Default Value	Property Data Type	Access
Object Identifier	AV30 (Analog Value 30)	BACnetObjectIdentifier	Read
Object Name	Analog Out DP Override	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	AO-DP-OR	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	percent (98)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The Analog Output DP Override is normally disabled unless enabled by BV13 Analog Output Override. Enable the override first, then set the 0-100 % output signal as required to test the output signal.

Analog Value Object (Present Value can be set from 1 to 255 seconds, resolution is 1 second)
Digital Input Self-reset Time (Default value is 30 seconds)

Property	Default Value	Property Data Type	Access
Object Identifier	AV31 (Analog Value 31)	BACnetObjectIdentifier	Read
Object Name	Digital Input Self-reset Time	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DI-Reset-Time	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	seconds (73)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

Analog Value Object (Present Value can be set from -500 to 0 Pa or -50 to 0 mmWc, resolution is 10 Pa or 1 mmWc))

Property	Default Value	Property Data Type	Access
Object Identifier	AV32 (Analog Value 32)	BACnetObjectIdentifier	Read
Object Name	Differential Pressure Low Range	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DP-Low Range	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The DP low range must be a minimum of 10Pa/1mmWc lower than the DP High Range setting (AV33).

Analog Value Object (Present Value can be set from 0 to 500 Pa or 0 to 50 mmWc, resolution is 10 Pa or 1 mmWc))

Property	Default Value	Property Data Type	Access
Object Identifier	AV33 (Analog Value 33)	BACnetObjectIdentifier	Read
Object Name	Differential Pressure High Range	CharacterString (32)	Read
Object Type	ANALOG_VALUE (2)	BACnetObjectType	Read
Present Value	current reading	Real	Read / Write
Description	DP-High Range	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Units	Pa (53) or mmWc (206)	BACnetEngineeringUnits	Read
Property List		BACnetArray	Read

The DP High range must be a minimum of 10Pa/1mmWc higher than the DP Low Range setting (AV32).

The binary input BACnet object allows reading of the digital input status. Binary input object properties are shown below.

Binary Input Object (Present Value is 1 (ACTIVE) if the DI is activated (pulled to common).
Digital Input (Present Value is 0 (INACTIVE) if the DI is not activated (floating).

Property	Default Value	Property Data Type	Access
Object Identifier	BI1 (Binary Input 1)	BACnetObjectIdentifier	Read
Object Name	Digital Input	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read

Description	Digital Input	CharacterString (32)	Read
Device Type	Indicates On/Off Status of DI	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Digital Input is normally disabled by MSV5 Digital Input Operation. This means that the digital input has no program function but it's status may still be read.

Binary Input Object (Present Value is normally 0, will change to 1 if the low temperature alarm is activated).
TEMP Alarm Low Status (Object flags change if the alarm is disabled in MSV1).

Property	Default Value	Property Data Type	Access
Object Identifier	BI2 (Binary Input 2)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm Low Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	0 = No Alarm, 1 = Alarm	CharacterString (32)	Read
Device Type	Indicates TAL Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary Input Object (Present Value is normally 0, will change to 1 if the high temperature alarm is activated).
TEMP Alarm High Status (Object flags change if the alarm is disabled in MSV1).

Property	Default Value	Property Data Type	Access
Object Identifier	BI3 (Binary Input 3)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm High Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	0 = No Alarm, 1 = Alarm	CharacterString (32)	Read
Device Type	Indicates TAH Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary Input Object (Present Value is normally 0, will change to 1 if the low RH alarm is activated).
RH Alarm Low Status (Object flags change if the alarm is disabled in MSV2).

Property	Default Value	Property Data Type	Access
Object Identifier	BI4 (Binary Input 4)	BACnetObjectIdentifier	Read
Object Name	RH Alarm Low Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	0 = No Alarm, 1 = Alarm	CharacterString (32)	Read
Device Type	Indicates RHAL Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read

Property List		BACnetArray	Read

Binary Input Object (Present Value is normally 0, will change to 1 if the high RH alarm is activated).
RH Alarm High Status (Object flags change if the alarm is disabled in MSV2).

Property	Default Value	Property Data Type	Access
Object Identifier	BI5 (Binary Input 5)	BACnetObjectIdentifier	Read
Object Name	RH Alarm High Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	0 = No Alarm, 1 = Alarm	CharacterString (32)	Read
Device Type	Indicates RHAH Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary Input Object (Present Value is normally 0, will change to 1 if the low DP alarm is activated).
DP Alarm Low Status (Object flags change if the alarm is disabled in MSV3).

Property	Default Value	Property Data Type	Access
Object Identifier	BI6 (Binary Input 6)	BACnetObjectIdentifier	Read
Object Name	DP Alarm Low Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	0 = No Alarm, 1 = Alarm	CharacterString (32)	Read
Device Type	Indicates DPAL Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

Binary Input Object (Present Value is normally 0, will change to 1 if the high DP alarm is activated).
DP Alarm High Status (Object flags change if the alarm is disabled in MSV3).

Property	Default Value	Property Data Type	Access
Object Identifier	BI7 (Binary Input 7)	BACnetObjectIdentifier	Read
Object Name	DP Alarm High Status	CharacterString (32)	Read
Object Type	BINARY_INPUT (3)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read
Description	0 = No Alarm, 1 = Alarm	CharacterString (32)	Read
Device Type	Indicates DPAH Status	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if disabled	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if disabled	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Polarity	Normal (0)	BACnetPolarity	Read
Property List		BACnetArray	Read

The binary value BACnet objects allow configuration of the device. Binary value object properties are shown below.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Celsius. Can be set to 1 (ACTIVE) for Fahrenheit)
TEMP Units

Property	Default Value	Property Data Type	Access
Object Identifier	BV1 (Binary Value 1)	BACnetObjectIdentifier	Read
Object Name	TEMP Units	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Celsius (0) or Fahrenheit (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Pa. Can be set to 1 (ACTIVE) for mmWc)
DP Units

Property	Default Value	Property Data Type	Access
Object Identifier	BV2 (Binary Value 2)	BACnetObjectIdentifier	Read
Object Name	DP Units	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Pa (0) or mmWc (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Normal Operation. Set to 1 (ACTIVE)
DP Auto Zero to initiate an auto zero of the pressure sensor)

Property	Default Value	Property Data Type	Access
Object Identifier	BV3 (Binary Value 3)	BACnetObjectIdentifier	Read
Object Name	DP Auto Zero	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Normal (0) or Do Auto Zero (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if no sensor	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if no sensor	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

This object is disabled for Type C model with remote transmitters

Rules are enforced: Only perform auto zero function if DP is within ± 0 - 20% of range

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Fast. Can be set to 1 (ACTIVE) for Slow)
TEMP Response Time

Property	Default Value	Property Data Type	Access
Object Identifier	BV4 (Binary Value 4)	BACnetObjectIdentifier	Read
Object Name	TEMP Response Time	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Fast (0) or Slow (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

For fast response there is a minimum amount of digital filtering applied to the measurement so that the sensor reacts quickly to changes. Slow response applies a longer period of filtering to the measurement and will slow down the sensor reaction to changes. Fast response = 1 update per second, Slow response = 1 update per 5 seconds.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Fast. Can be set to 1 (ACTIVE) for Slow)
RH Response Time

Property	Default Value	Property Data Type	Access
Object Identifier	BV5 (Binary Value 5)	BACnetObjectIdentifier	Read
Object Name	RH Response Time	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Fast (0) or Slow (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

For fast response there is a minimum amount of digital filtering applied to the measurement so that the sensor reacts quickly to changes. Slow response applies a longer period of filtering to the measurement and will slow down the sensor reaction to changes. Fast response = 1 update per second, Slow response = 1 update per 5 seconds.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Fast. Can be set to 1 (ACTIVE) for Slow)
DP Response Time

Property	Default Value	Property Data Type	Access
Object Identifier	BV6 (Binary Value 6)	BACnetObjectIdentifier	Read
Object Name	DP Response Time	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Fast (0) or Slow (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

For fast response there is a minimum amount of digital filtering applied to the measurement so that the sensor reacts quickly to changes. Slow response applies a longer period of filtering to the measurement and will slow down the sensor reaction to changes. Fast response = 1 update per second, Slow response = 1 update per 5 seconds.

Binary Value Object (Present Value defaults to 1 (ACTIVE) for On. Can be set to 0 (INACTIVE) for Off)
TEMP Display

Property	Default Value	Property Data Type	Access
Object Identifier	BV7 (Binary Value 7)	BACnetObjectIdentifier	Read
Object Name	TEMP Display	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Off (0) or On (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Setting Present Value to 0 disables the display of the TEMP value and also the associated LEDs.

Binary Value Object (Present Value defaults to 1 (ACTIVE) for On. Can be set to 0 (INACTIVE) for Off)
RH Display

Property	Default Value	Property Data Type	Access
Object Identifier	BV8 (Binary Value 8)	BACnetObjectIdentifier	Read
Object Name	RH Display	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Off (0) or On (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Setting Present Value to 0 disables the display of the RH value and also the associated LEDs.

Binary Value Object (Present Value defaults to 1 (ACTIVE) for On. Can be set to 0 (INACTIVE) for Off)
DP Display

Property	Default Value	Property Data Type	Access
Object Identifier	BV9 (Binary Value 9)	BACnetObjectIdentifier	Read
Object Name	DP Display	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Off (0) or On (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Setting Present Value to 0 disables the display of the DP value and also the associated LEDs.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Direct. Can be set to 1 (ACTIVE) for Reverse)
TEMP Out Direction

Property	Default Value	Property Data Type	Access
Object Identifier	BV10 (Binary Value 10)	BACnetObjectIdentifier	Read
Object Name	TEMP Output Direction	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Direct (0) or Reverse (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

When set to Direct (0), the TEMP analog output signal will be either 0-5 Vdc, 0-10 Vdc or 4-20 mA.
When set to Reverse (1), the signal will be reversed to 5-0 Vdc, 10-0 Vdc or 20-4 mA.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Direct. Can be set to 1 (ACTIVE) for Reverse)
RH Out Direction

Property	Default Value	Property Data Type	Access
Object Identifier	BV11 (Binary Value 11)	BACnetObjectIdentifier	Read
Object Name	RH Output Direction	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Direct (0) or Reverse (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

When set to Direct (0), the RH analog output signal will be either 0-5 Vdc, 0-10 Vdc or 4-20 mA.
When set to Reverse (1), the signal will be reversed to 5-0 Vdc, 10-0 Vdc or 20-4 mA.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Direct. Can be set to 1 (ACTIVE) for Reverse)
DP Out Direction

Property	Default Value	Property Data Type	Access
Object Identifier	BV12 (Binary Value 12)	BACnetObjectIdentifier	Read
Object Name	DP Output Direction	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Direct (0) or Reverse (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

When set to Direct (0), the DP analog output signal will be either 0-5 Vdc, 0-10 Vdc or 4-20 mA.
When set to Reverse (1), the signal will be reversed to 5-0 Vdc, 10-0 Vdc or 20-4 mA.

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Normal. Can be set to 1 (ACTIVE) for Override)
Analog Output Override

Property	Default Value	Property Data Type	Access
Object Identifier	BV13 (Binary Value 13)	BACnetObjectIdentifier	Read
Object Name	Analog Output Override	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Normal (0) or Override (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

When set to Normal (0), the analog output signals represent the sensor measured values.
When set to Override (1), the analog output signals are manually controlled by AV28 – AV30 for testing purposes.

Binary Value Object (Present Value defaults to 1 for Manual + Automatic. Can be set to 0 for Manual reset only)
Buzzer Reset

Property	Default Value	Property Data Type	Access
Object Identifier	BV14 (Binary Value 14)	BACnetObjectIdentifier	Read
Object Name	Buzzer Reset	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Manual (0) or Manual + Automatic (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

When set to Manual + Automatic (1), the alarm buzzer can be silenced by removing the alarm condition, pressing the <SILENCE> key or by setting ALARM ACKNOWLEDGE via the network, or it will reset automatically when the BUZZER AUTO RESET TIME EXPIRES.

When set to Manual (0), the alarm buzzer will not reset automatically after a time period.

Binary Value Object (Present Value defaults to 0 for Normal. Writing 1 causes an alarm acknowledge)
Alarm Acknowledge

Property	Default Value	Property Data Type	Access
Object Identifier	BV15 (Binary Value 15)	BACnetObjectIdentifier	Read
Object Name	Alarm Acknowledge	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Normal (0) or Acknowledged (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Writing a 1 to Present Value causes the same reaction as pressing the <SILENCE> key. Present Value resets to 0 once registered.

Binary Value Object (Present Value defaults to 1 for Momentary Self-reset. Set to 0 for Latch operation)
Digital Input Mode

Property	Default Value	Property Data Type	Access
Object Identifier	BV16 (Binary Value 16)	BACnetObjectIdentifier	Read
Object Name	Digital Input Mode	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	Latch (0) or Momentary (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

In latch mode, DIGITAL INPUT STATUS will activate when there is a contact closure on the digital input and it will remain activated until DIGITAL INPUT STATUS is reset manually by writing to the variable.

In momentary self-reset mode, the DIGITAL INPUT STATUS will reset itself after a time period as set by DIGITAL INPUT SELF-RESET TIME between 1-255 seconds.

Binary Value Object (Present Value is normally 0, it changes to 1 if the digital input has been activated)
Digital Input Status

Property	Default Value	Property Data Type	Access
Object Identifier	BV17 (Binary Value 17)	BACnetObjectIdentifier	Read
Object Name	Digital Input Status	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Normal (0) or Activated (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Present Value changes to 1 (ACTIVE) if the digital input has been activated.

The Digital Input Status has two operating modes as set by BV16 (Digital Input Mode). It can be either manually reset by writing 0(INACTIVE) back to BV17 Present Value, or it can be self-resetting after a time period as set by AV31 (Digital Input Self-reset Time).

Binary Value Object (Present Value defaults to 0 for Not Locked, can be set to 1 to Lock the setpoints)
Setpoint Lock

Property	Default Value	Property Data Type	Access
Object Identifier	BV18 (Binary Value 18)	BACnetObjectIdentifier	Read
Object Name	Setpoint Lock	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Not Locked (0) or Locked (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

If Locked, then the alarm setpoint cannot be changed via the User Menu.

Binary Value Object (Present Value defaults to 0 for Not Locked, can be set to 1 to Lock the User Menu)
User Menu Lock

Property	Default Value	Property Data Type	Access
Object Identifier	BV19 (Binary Value 19)	BACnetObjectIdentifier	Read
Object Name	User Menu Lock	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Not Locked (0) or Locked (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

If Locked, then the User Menu cannot be accessed via the <MENU> key.

Binary Value Object (Present Value defaults to 0 for Not Locked, can be set to 1 to Lock the Installer Menu)
Installer Menu Lock

Property	Default Value	Property Data Type	Access
Object Identifier	BV20 (Binary Value 20)	BACnetObjectIdentifier	Read
Object Name	Installer Menu Lock	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Not Locked (0) or Locked (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

If Locked, then the Installer Menu cannot be accessed by holding the <UP> and <DOWN> keys.

Binary Value Object (Present Value defaults to 0 for Low Brightness, can be set to 1 for High Brightness)
Display Brightness

Property	Default Value	Property Data Type	Access
Object Identifier	BV21 (Binary Value 21)	BACnetObjectIdentifier	Read
Object Name	Display Brightness	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Low (0) or High (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary Value Object (Present Value defaults to 1 for 0-50 °C (32-122 °F), can be set to 0 for 0-35 °C (32-95 °F))
TEMP Analog Input Range

Property	Default Value	Property Data Type	Access
Object Identifier	BV22 (Binary Value 22)	BACnetObjectIdentifier	Read
Object Name	TEMP Analog Input Range	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	ACTIVE (1)	BACnetBinaryPV	Read / Write
Description	0-35 C (0) or 0-50 C (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if no sensor	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if no sensor	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Only used for Type C with remote transmitters.

Binary Value Object (Present Value defaults to 0 for mA, can be set to 1 for Voltage)
Analog Input Signal Type

Property	Default Value	Property Data Type	Access
Object Identifier	BV23(Binary Value 23)	BACnetObjectIdentifier	Read
Object Name	Analog Input Signal Type	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	mA (0) or Voltage (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if no sensor	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if no sensor	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Only used for Type C with remote transmitters.

Binary Value Object (Present Value defaults to 0 for 0-5 Vdc, can be set to 1 for 0-10 Vdc)
Analog Input Volt Range

Property	Default Value	Property Data Type	Access
Object Identifier	BV24 (Binary Value 24)	BACnetObjectIdentifier	Read
Object Name	Analog Input Volt Range	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	0-5 Vdc (0) or 0-10 Vdc (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000) or (1100) if no sensor	BACnetStatusFlags	Read
Event State	NORMAL (0) or FAULT (1) if no sensor	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Only used for Type C with remote transmitters.

Binary Value Object (Present Value defaults to 0 for mA, can be set to 1 for Voltage)
Analog Output Signal Type

Property	Default Value	Property Data Type	Access
Object Identifier	BV25 (Binary Value 25)	BACnetObjectIdentifier	Read
Object Name	Analog Output Signal Type	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	mA (0) or Voltage (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary Value Object (Present Value defaults to 0 for 0-5 Vdc, can be set to 1 for 0-10 Vdc)
Analog Output Volt Range

Property	Default Value	Property Data Type	Access
Object Identifier	BV26 (Binary Value 26)	BACnetObjectIdentifier	Read
Object Name	Analog Output Volt Range	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	0-5 Vdc (0) or 0-10 Vdc (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Binary Value Object (Present Value defaults to 0 (INACTIVE) for Normal Operation. Set to 1 (ACTIVE)
Min Max Reset to reset all min max values in AI4 to AI9)

Property	Default Value	Property Data Type	Access
Object Identifier	BV27 (Binary Value 27)	BACnetObjectIdentifier	Read
Object Name	Min Max Reset	CharacterString (32)	Read
Object Type	BINARY_VALUE (5)	BACnetObjectType	Read
Present Value	INACTIVE (0)	BACnetBinaryPV	Read / Write
Description	Normal (0) or Reset (1)	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Property List		BACnetArray	Read

Rules are enforced: All min max values are reset

The multi-state value BACnet objects allow configuration of the device. Multi-state value object properties are shown below.

Multi-state Value Object (Present Value states are shown below)
TEMP Alarm Operation

Property	Default Value	Property Data Type	Access
Object Identifier	MSV1 (Multi-state Value 1)	BACnetObjectIdentifier	Read
Object Name	TEMP Alarm Operation	CharacterString (32)	Read
Object Type	MULTISTATE_VALUE (19)	BACnetObjectType	Read
Present Value	4	Unsigned	Read / Write
Description	1=Low, 2=High, 3=Both, 4=Disable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Number of States	4	Unsigned	Read
Property List		BACnetArray	Read

MSV1 State	Description	Setpoint
1	Low Alarm – Only the TEMP Low Alarm is enabled	TALS
2	High Alarm – Only the TEMP High Alarm is enabled	TAHS
3	Both – Both TEMP Low and High Alarms are enabled	TALS + TAHS
4	Disable – No TEMP Alarm enabled	none

Multi-state Value Object (Present Value states are shown below)
RH Alarm Operation

Property	Default Value	Property Data Type	Access
Object Identifier	MSV2 (Multi-state Value 2)	BACnetObjectIdentifier	Read
Object Name	RH Alarm Operation	CharacterString (32)	Read
Object Type	MULTISTATE_VALUE (19)	BACnetObjectType	Read
Present Value	4	Unsigned	Read / Write
Description	1=Low, 2=High, 3=Both, 4=Disable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Number of States	4	Unsigned	Read
Property List		BACnetArray	Read

MSV2 State	Description	Setpoint
1	Low Alarm – Only the RH Low Alarm is enabled	RHALS
2	High Alarm – Only the RH High Alarm is enabled	RHAHS
3	Both – Both RH Low and High Alarms are enabled	RHALS + RHAHS
4	Disable – No RH Alarm enabled	none

Multi-state Value Object (Present Value states are shown below)
DP Alarm Operation

Property	Default Value	Property Data Type	Access
Object Identifier	MSV3 (Multi-state Value 3)	BACnetObjectIdentifier	Read
Object Name	DP Alarm Operation	CharacterString (32)	Read
Object Type	MULTISTATE_VALUE (19)	BACnetObjectType	Read
Present Value	3	Unsigned	Read / Write
Description	1=Low, 2=High, 3=Both, 4=Disable	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Number of States	4	Unsigned	Read
Property List		BACnetArray	Read

MSV3 State	Description	Setpoint
1	Low Alarm – Only the DP Low Alarm is enabled	DPALS
2	High Alarm – Only the DP High Alarm is enabled	DPAHS
3	Both – Both DP Low and High Alarms are enabled	DPALS + DPAHS
4	Disable – No DP Alarm enabled	none

Multi-state Value Object (Present Value states are shown below)
Buzzer Assignment

Property	Default Value	Property Data Type	Access
Object Identifier	MSV4 (Multi-state Value 4)	BACnetObjectIdentifier	Read
Object Name	Buzzer Assignment	CharacterString (32)	Read
Object Type	MULTISTATE_VALUE (19)	BACnetObjectType	Read
Present Value	3	Unsigned	Read / Write
Description	1=TEMP,2=RH,3=DP,4=Disable,5=All	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Number of States	5	Unsigned	Read
Property List		BACnetArray	Read

MSV4 State	Description
1	TEMP – Buzzer only operates on TEMP alarm
2	RH – Buzzer only operates on RH alarm
3	DP – Buzzer only operates on DP alarm
4	Disable – Buzzer is disabled, does not operate
5	All – Buzzer operates on any TEMP, RH or DP alarm

Multi-state Value Object (Present Value states are shown below)
Digital Input Function

Property	Default Value	Property Data Type	Access
Object Identifier	MSV5 (Multi-state Value 5)	BACnetObjectIdentifier	Read
Object Name	Digital Input Function	CharacterString (32)	Read
Object Type	MULTISTATE_VALUE (19)	BACnetObjectType	Read
Present Value	1	Unsigned	Read / Write
Description	1=Disable, 2=Freeze, 3=Silence	CharacterString (32)	Read
Status Flags	{false, false, false, false} (0000)	BACnetStatusFlags	Read
Event State	NORMAL (0)	BACnetEventState	Read
Out of Service	FALSE (0)	Boolean	Read
Number of States	3	Unsigned	Read
Property List		BACnetArray	Read

MSV5 State	Description
1	Disable – Digital input has no internal program function, status can still be read for external functions
2	Freeze – Door freeze function, freezes device operation if a door open signal is received
3	Silence – Alarm Silence function, operates as a remote silence switch to silence the buzzer

BACnet Protocol Implementation Conformance Statement (PICS)

Date : August 16, 2021
Vendor Name : Greystone Energy Systems
Product Name : Clean Room Sensor
Product Model Number : CRA, CRB, CRC
Application Software Version : 1.0
Firmware Revision : 1.05
BACnet Protocol Revision : 14

Product Description : The Greystone Clean Room Sensor is a smart room sensor with native BACnet MS/TP protocol for network communication. It measures room temperature, relative humidity and differential pressure levels and reports values back to a building automation system (BAS). The device features large LED displays of measured values and multiple alarms.

BACnet Standardized Device Profile (Annex L) : BACnet Application Specific Controller (B-ASC)

BACnet Interoperability Building Blocks Supported (Annex K) : DS-RP-B, DS-RPM-B, DS-WP-B, DM-DDB-B, DM-DOB-B, DM-DCC-B

Segmentation Capability : Not supported

Standard Object Types Supported :

Object Type	Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
Device	No	No	Location, Description, Max_Master, Max_Info_Frames	Object_Identifier, Object_Name, Location, Description, APDU_Timeout, Max_Master, Number_Of_APDU_Retries
Analog Input	No	No	Description, Reliability, Device_Type	
Analog Value	No	No	Description	Present_Value
Binary Input	No	No	Description, Reliability	
Binary Value	No	No	Description, Reliability	Present_Value
Multi-State Value	No	No	Description, Reliability	Present_Value

Data Link Layer Options : MS/TP master (Clause 9)
Baud rates : 9600, 19200, 38400, 57600, 76800, 115200

Device Address Binding : Not supported

Networking Options : None

Character Set Supported : ISO 10646 (UTF-8)

