



**neptronic®**

# **SKG4 Gas Fired Humidifier**

## **BACnet Communication Module User Guide**



**BACnet**

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## Introduction

The SKG4 Gas Fired Humidifier BACnet Communication Module User Guide provides information about using the humidifiers with BACnet communications feature. The BACnet communication protocol for building automation and control networks enables communication between client devices within a network. The humidifier provides a BACnet network interface between BACnet client devices and Neptronic humidifiers. It uses the BACnet Master Slave/Token Passing (MS/TP) protocol and BACnet IP at the BACnet MAC layer.

## Pre-requisites

The BACnet communication user guide assumes that you are familiar with the concepts of BACnet and its terminology.

## Advantages of BACnet

BACnet enabled humidifiers have the following advantages:

- *Quick Message Transmission.* The humidifier uses a synchronous implementation for BACnet messages making it quick and efficient. Each BACnet confirmed service request is answered as quickly as possible without using the **Reply Postponed** frame. The MS/TP implementation is performed within **Tusage\_delay** of 15 minutes to ensure a **Tusage\_timeout** value within 20 minutes.
- *MS/TP Support.* The humidifier supports a Full Master Node state machine for MS/TP. The **Max\_Master** and the instances are configured to the device object through **BACnet WriteProperty** service or via the device's Programming Mode. The MAC address and the MS/TP baud rate setting of 9600, 19200, 38400, and 76800 are also set through the **BACnet Write Property** service or via the device's Programming Mode. In Programming mode, the device is configured through the device's keypad. For more information about the WriteProperty, refer to Table 3 - Object Types Supported.
- *BIBB Support.* The humidifier functions the same way as the B-ASC type profile server and supports the specific BIBB as per their relevant definitions.

|            |            |                |
|------------|------------|----------------|
| ○ DS-RP-B  | ○ DM-DDB-B | ○ DS-COV-B     |
| ○ DS-RPM-B | ○ DM-DOB-B | ○ DS-COVP-B    |
| ○ DS-WP-B  | ○ DM-RD-B  | ○ SCHED-WS-I-B |
| ○ DS-WPM-B | ○ DM-TS-B  |                |
| ○ DM-DCC-B | ○ DM-UTC-B |                |
- *Object Support.* The humidifier supports a fixed list of BACnet visible values, which appear as **Present\_Values** of various BACnet standard object types in addition to a device object. For more information, refer to Table 3 - Object Types Supported.
- *Alarms.* The humidifier supports indication of various alarm conditions through value changes in properties of several objects. However, it does not generate BACnet event notifications.



## BACnet Properties Configuration

To establish communication on the network, and guarantee a unique ID of devices in a BACnet system, the following properties may have to be configured.

**Table 1 - BACnet Properties Configuration**

| Property                  | Default Value      | Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MAC Address               | 001                | <ul style="list-style-type: none"><li>Set to a unique address on the network between 000 and 254.</li><li>The value can be set manually via the menu.</li><li>The values from 128-254 represent MS/TP non-token passing slave devices.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Device Instance           | Auto               | <ul style="list-style-type: none"><li>The humidifier automatically configures its device instance to 153,000 + MAC address.</li><li>The value can be set manually via the menu.</li><li>The value can be set manually through the <b>WriteProperty</b> service to <b>Device Object.Object_Identifier</b>.</li><li>The device's <b>Object_Identifier</b> is a combination of the <b>Device Object_Type</b> (8) and the <b>Device_Instance</b> (0-4194302), therefore its decimal or hexadecimal representation tends to be incomprehensible.</li><li>For example, the <b>Device_Instance</b>=1000 has an equivalent <b>Object_Identifier</b> of 0x020003E8 hexadecimal or 33555432 decimal.</li></ul> |
| Baud Rate                 | 0 = Auto           | <ul style="list-style-type: none"><li>The humidifier configures its baud rate automatically by detecting the network upon connection.</li><li>The value can be set manually from the available values of (0) Auto, 9600, 19200, 38400, and 76800.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Max_Master                | 127                | <ul style="list-style-type: none"><li>Configure <b>Max_Master</b> value to increase network efficiency when there are less than 127 devices on the network.</li><li>The <b>Max_Master</b> value can be changed through the <b>WriteProperty</b> service to <b>Device Object.Max_Master</b>.</li></ul> <p>For more information, refer to the MAC Address and Max_Master section.</p>                                                                                                                                                                                                                                                                                                                  |
| Device Object.Object_Name | Name of the device | <ul style="list-style-type: none"><li>Configure the name of the device through the <b>WriteProperty</b> service to <b>Device Object.Object_Name</b>. For example, SKG4.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



# Configuration Options

The following Configuration options enable you to configure and run the BACnet features of the humidifiers quickly.

## Quick Setup

Configure the humidifier for BACnet communication without programming.

1. Ensure that no other device on the network has a MAC address of 1 (the humidifier's default address).
2. Connect the humidifier to the network and power it up.
3. The humidifier automatically configures the baud rate and device instance allowing BACnet Property Configuration through the Write Property service. See Table 1 - BACnet Properties Configuration.
4. Repeat the steps for each humidifier.

## Manual Setup

Configure the humidifier for BACnet communication using the SKG4 controller, by using the following steps:

1. Press the Enter key.
2. Enter the Integration menu password: **5544**.
3. Select the Network or Communication sub-menus to set appropriate values.
4. Follow the instructions to configure the Device, BACnet Server, BACnet MSTP/IP and so on, manually.
5. Disconnect the power to the humidifier, connect the humidifier to the network, and connect the power again.

### MAC Address and Max\_Master

The MAC address must be unique on the entire MS/TP network. However, having a unique MAC address and a high baud rate does not guarantee efficient operation of the humidifier and other MS/TP units on the MS/TP network. Some MAC address and Max\_Master combinations are more efficient than others. BACnet requires token-passing units to occasionally "poll" for other masters based on the MAC address and Max\_Master.

A poor combination of MAC addresses and Max\_Master can lead to a slower network due to lost time polling for masters that are not present. Unless there are 126 other units on the MS/TP network, the default Max\_Master value of 127 is not the most efficient choice for the humidifier. The Max\_Master default value of 127 was selected to ensure that any master, specifically a BACnet client can be found when the humidifier is initially started.

### Examples of MAC Address and Max\_Master Configurations

The following are some of the examples to indicate the optimum combination of MAC address and Max\_Master configurations to ensure a quick and efficient output.

#### Example 1

- MAC=0. Max\_Master=127
- MAC=1, Max\_Master=127

This configuration is slow and inefficient because every time either unit is required to find another master unit, it has to poll 126 units until it finds the right one to pass the token.

#### Example 2

- MAC=0. Max\_Master=5
- MAC=1 to MAC=4 are not used
- MAC=5, Max\_Master=5

This configuration is better than Example 1 but it is still not optimal. The Max\_Master is set to the most efficient value but the gap between the two MAC addresses is high. Therefore, each unit must poll four units until it finds the right one to pass the token.



#### Example 3

- MAC=0, Max\_Master=1
- MAC=2, Max\_Master=2

This is an incorrect configuration. The MAC=0 will never find MAC=2 because it will never poll for the master MAC address=2.

#### Example 4

- MAC=0, Max\_Master=3
- MAC=1, Max\_Master=3
- MAC=2, Max\_Master=3
- MAC=3, Max\_Master=3

This is an efficient configuration as the units are numbered consecutively and the MAX\_Master is set to the most efficient value. As a general guideline, the most efficient setup for an MS/TP network is one in which the units are consecutively numbered starting at MAC address 0 and having Max\_Master=the maximum MAC address in the system. If consecutive numbering is not possible, then the next most efficient setup is one in which all units have Max\_Master=the maximum MAC address in the system.

## IP Port

For IP communication, a port number of **47808 (0xBAC0)** is used by default. Ensure that the BMS accesses the port with which the humidifier communicates. Generally, in situations with multiple networks, different ports may be used such as 47809 (0xBAC1) or 47810 (0xBAC2) to separate traffic.

## Network Reset

Reset the humidifier via BACnet using the **Reinitialize Device** service. The Reinitialize Device service can be accessed using the following password: **nep**.

The Reinitialize Device service has two types of reset such as:

- *Warm Reset.* The Warm Reset changes the humidifier to its initial state.
- *Cold Reset.* The Cold Reset restarts the humidifier.



## Device Object Properties

The following table lists all the BACnet properties supported for the device object. The W indicates that the property is writable using the BACnet **WriteProperty** service.

**Table 2 - Device Object Properties**

| Property                        | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Writable |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Object_Identifier               | <ul style="list-style-type: none"> <li>Programmable where the instance part of the Object_Identifier is in the range of 0-4194302</li> <li>The device instance must be unique system-wide</li> <li>The default value for the device instance= 153001 (Vendor_Identifier*1000 + MAC)</li> </ul>                                                                                                                                                                                                                                                                | W        |
| Object_Name                     | SKG4, programmable up to 32 Bytes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | W        |
| Description                     | Programmable up to 32 Bytes (default: SKG4 Controller)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | W        |
| Object_Type                     | Device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| System_Status                   | Operational                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |
| Vendor_Identifier               | Always 153                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |
| Vendor_Name                     | Always Neptronic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |
| Model_Name                      | Example, SKG4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| Firmware_Revision               | Currently, 2.00.202012151115                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| Application_Software_Version    | Currently, 2.00.20201215                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| Protocol_Version                | Always 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| Protocol_Revision               | Always 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |
| DataBase_Revision               | Default 0; incremented if Object Name, Object List and/or device ID change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |
| Max_APDU_Length_Accepted        | Always 480                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |
| Segmentation_Supported          | (3) = No Segmentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |
| APDU_Timeout                    | 3,000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | W        |
| Number_of_APDU_Retries          | Always 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| Local_Time                      | 00:00:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | W        |
| Local_Date                      | 01-Jan-2015 (Thu)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | W        |
| Utc_Offset                      | -300 minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | W        |
| Daylight_Savings_Status         | False                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | W        |
| Backup_Failure_Timeout          | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | W        |
| Configuration_Files             | File-1 through File-17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| Last_Restore_Time               | 2015-01-01 (Thu), 00:00:00:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| Backup_And_Restore_State        | IDLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |
| Backup_Preparation_Time         | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |
| Restore_Completion_Time         | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |
| Restore_Preparation_Time        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |
| Protocol_Services_Supported     | <ul style="list-style-type: none"> <li>confirmedCOVNotification</li> <li>subscribeCOV</li> <li>atomicReadFile</li> <li>atomicWriteFile</li> <li>readProperty</li> <li>readPropertyMultiple</li> <li>WriteProperty</li> <li>writePropertyMultiple</li> <li>deviceCommunicationControl</li> <li>reinitializeDevice</li> <li>i-Am</li> <li>i-Have</li> <li>unconfirmedCOVNotification</li> <li>unconfirmedPrivateTransfer</li> <li>timeSynchronization</li> <li>who-Has</li> <li>who-Is</li> <li>utcTimeSynchronization</li> <li>subscribeCOVProperty</li> </ul> |          |
| Protocol_Object_Types_Supported | <ul style="list-style-type: none"> <li>analog-input</li> <li>analog-output</li> <li>analog-value</li> <li>binary-input</li> <li>binary-output</li> <li>binary-value</li> <li>device</li> <li>file</li> <li>group</li> <li>multi-state-input</li> <li>multi-state-output</li> <li>program</li> <li>Schedule</li> <li>multi-state-value</li> <li>characterstring-value</li> <li>date-value</li> <li>datetime-value</li> <li>positive-integer-value</li> <li>time-value</li> </ul>                                                                               |          |
| Object_List                     | 132                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |
| Device_Address_Binding          | Depends on configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| Max_Master                      | Programmable in the range of 1 to 127 (default: 127)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | W        |
| Max_Info_Frames                 | Always 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| Active_COV_Subscription         | Empty by default. COV subscription will be lost on a power cycle.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |



| Property      | Value                                            | Writable |
|---------------|--------------------------------------------------|----------|
| Property_List | List of properties that exist within the object. |          |

## Object Types Supported

The following table lists all the BACnet properties supported for each object type. Most of the properties are locked. The exception is **Present\_Value**, which represents the dynamic operating values of the device, and the Status\_Flag, Event\_State, and Reliability properties, which reflect the availability of the **Present\_Value**. Unless otherwise specified, properties are not changeable.

**Table 3 - Object Types Supported**

| Object Type                                                                                                                                                  | Enabled | Optional Properties Supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Writable Properties                                                                                                                                                                                                                                                                                    | Notes                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Note: Writable properties are different for some objects. Refer to the respective Object Table information to know the writable property for objects.</i> |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                    |
| Analog Input                                                                                                                                                 | ☑       | <ul style="list-style-type: none"> <li>Reliability</li> <li>Description</li> <li>Min_Present_Value</li> <li>Max_Present_Value</li> <li>Resolution</li> <li>COV_Increment</li> </ul>                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Out_of_Service</li> <li>COV_Increment</li> <li>Units</li> </ul>                                                                                                                                                                                                 | If "Out_of_Service" is true, Present_Value becomes a writable property. Refer to Out_of_Service Property section on page 7 for more information.                                                   |
| Analog Value                                                                                                                                                 | ☑       | <ul style="list-style-type: none"> <li>Reliability</li> <li>Description</li> <li>Min_Present_Value</li> <li>Max_Present_Value</li> <li>Resolution</li> <li>COV_Increment</li> <li>Priority_Array</li> <li>Relinquish_Default</li> </ul>                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> <li>COV_Increment</li> <li>Relinquish_Default</li> <li>Units</li> </ul>                                                                                                                                              | Refer to Out_of_Service Property section on page 7 for more information.                                                                                                                           |
| Analog Output                                                                                                                                                | ☑       | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>Min-Pres-Value</li> <li>Max-Pres-Value</li> <li>Resolution</li> <li>COV_Increment</li> </ul>                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Present_Value</li> <li>COV_Increment</li> <li>Out_of_Service</li> <li>Relinquish_Default</li> <li>Units</li> </ul>                                                                                                                                              |                                                                                                                                                                                                    |
| Binary Input                                                                                                                                                 | ☑       | <ul style="list-style-type: none"> <li>Reliability</li> <li>Active_Text</li> <li>Inactive_Text</li> <li>Description</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Out_of_Service</li> <li>Polarity</li> </ul>                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>If "Out_of_Service" is true, Present_Value becomes a writable property. Refer to Out_of_Service Property section on page 7 for more information.</li> </ul> |
| Binary Value                                                                                                                                                 | ☑       | <ul style="list-style-type: none"> <li>Reliability</li> <li>Active_Text</li> <li>Inactive_Text</li> <li>Description</li> <li>Priority_Array</li> <li>Relinquish_Default</li> <li>Minimum_Off_Time</li> <li>Minimum_On_Time</li> </ul>                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> <li>Relinquish_Default</li> <li>Minimum_Off_Time</li> <li>Minimum_On_Time</li> </ul>                                                                                                                                 | Refer to Out_of_Service Property section on page 7 for more information.                                                                                                                           |
| Binary Output                                                                                                                                                | ☑       | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>Inactive-text</li> <li>Active-text</li> <li>Minimum_Off_Time</li> <li>Minimum_On_Time</li> </ul>                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> <li>Polarity</li> <li>Relinquish_Default</li> <li>Minimum_Off_Time</li> <li>Minimum_On_Time</li> </ul>                                                                                                               |                                                                                                                                                                                                    |
| Device                                                                                                                                                       | ☑       | <ul style="list-style-type: none"> <li>Max_Master</li> <li>Max_Info_Frame</li> <li>Description</li> <li>active-COV-subscriptions</li> <li>Local_Time</li> <li>Local_Date</li> <li>UTC_Offset</li> <li>Daylight_Savings_Status</li> <li>Backup_Failure_Timeout</li> <li>Configuration_Files</li> <li>Last_Restore_Time</li> <li>Backup_And_Restore_State</li> <li>Backup_Preparation_Time</li> <li>Restore_Completion_Time</li> <li>Restore_Preparation_Time</li> <li>Location</li> <li>Serial_Number</li> <li>Profile_Name</li> </ul> | <ul style="list-style-type: none"> <li>Object_Identifier</li> <li>Object_Name</li> <li>Max_Master</li> <li>Description</li> <li>Local_Time</li> <li>Local_Date</li> <li>UTC_Offset</li> <li>Daylight_Savings_Status</li> <li>Apdu_Timeout</li> <li>Backup_Failure_Timeout</li> <li>Location</li> </ul> |                                                                                                                                                                                                    |



| Object Type            | Enabled                             | Optional Properties Supported                                                                                                                                                                                                                     | Writable Properties                                                                                                                                                                                                     | Notes                                                                                       |
|------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| File                   | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> <li>Description</li> </ul>                                                                                                                                                                                     | File_Size                                                                                                                                                                                                               | Only 0 is the accepted value to be written to the file size.                                |
| Group                  | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> </ul>                                                                                                                                                                                     |                                                                                                                                                                                                                         |                                                                                             |
| Multi-State Input      | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>State_Text</li> </ul>                                                                                                                                            | <ul style="list-style-type: none"> <li>Out_of_Service</li> </ul>                                                                                                                                                        |                                                                                             |
| Multi-State Output     | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>State_Text</li> </ul>                                                                                                                                            | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> <li>Relinquish_Default</li> </ul>                                                                                                     |                                                                                             |
| Program                | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> </ul>                                                                                                                                                                | <ul style="list-style-type: none"> <li>Program_Change</li> <li>Out_of_Service</li> </ul>                                                                                                                                | Only LOAD and RESTART are supported for program change. Use LOAD to apply the new firmware. |
| Schedule               | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> <li>Description</li> <li>Weekly_Schedule</li> </ul>                                                                                                                                                            | <ul style="list-style-type: none"> <li>Effective_Period</li> <li>Schedule_Default</li> <li>List_of_Object_Property_References</li> <li>Priority_for_Writing</li> <li>Out_of_Service</li> <li>Weekly_Schedule</li> </ul> | If Out_of_Service is True, Present_Value becomes writable.                                  |
| Multi-State Value      | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>States_Text</li> <li>Priority_Array</li> <li>Relinquish_Default</li> </ul>                                                                                       | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Relinquish_Default</li> <li>Out_of_Service</li> </ul>                                                                                                     |                                                                                             |
| CharacterString Value  | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> <li>Description</li> </ul>                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Present_Value</li> </ul>                                                                                                                                                         |                                                                                             |
| Date                   | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>Event_State</li> <li>Out_of_Service</li> </ul>                                                                                                                   | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> </ul>                                                                                                                                 |                                                                                             |
| DateTime               | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>Event_State</li> <li>Out_of_Service</li> </ul>                                                                                                                   | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> </ul>                                                                                                                                 |                                                                                             |
| Positive-Integer Value | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>Event_State</li> <li>Out_of_Service</li> <li>Priority_Array</li> <li>Relinquish_Default</li> <li>Minimum_Present_Value</li> <li>Maximum_Present_Value</li> </ul> | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Units</li> <li>Out_of_Service</li> <li>Relinquish_Default</li> </ul>                                                                                      |                                                                                             |
| Time                   | <input type="checkbox"/>            | <ul style="list-style-type: none"> <li>Description</li> <li>Reliability</li> <li>Event_State</li> <li>Out_of_Service</li> </ul>                                                                                                                   | <ul style="list-style-type: none"> <li>Present_Value</li> <li>Out_of_Service</li> </ul>                                                                                                                                 |                                                                                             |

## Out\_of\_Service Property

Neptronic humidifiers offer the use of the Out\_of\_Service writable property. When the value of this property is set to True, it disconnects the object from the physical input, enabling you to input other values. This is useful for special applications or while troubleshooting. For example, you can ignore the temperature read from a sensor and input the desired temperature value in order to perform specific tests.



**Warning:** If the Out\_of\_Service property is set to **True**, Out\_of\_Service remains true until set to **False**.

## Object Table Information

The SKG4 uses the following BACnet object tables, categorized on the basis of their ID. The type is the BACnet Object type, the instance is the BACnet Object. Together, the type and instance form the **BACnet Object\_Identifier** for an object according to the following C-language algorithm:

- object\_identifier=(unsigned long)((unsigned long)type<<22)+instance

### Analog Input (AI)

**Table 4 - Object Table Information: Analog Input (AI)**

| ID   | Name             | List       | Description                                                          | W?                              | Notes                        |
|------|------------------|------------|----------------------------------------------------------------------|---------------------------------|------------------------------|
| AI.2 | Supply RH Signal | Integrator | Value of the duct or supply high limit humidity analog input signal. | Out_of_Service<br>COV_Increment | 0V to 15V, 0.001V            |
| AI.3 | Room RH Signal   | Integrator | Value of the room humidity analog input signal.                      | Out_of_Service<br>COV_Increment | 0V to 15V, Resolution 1V     |
| AI.4 | Control Signal   | Integrator | Value of the current demand analog input signal.                     | Out_of_Service<br>COV_Increment | 0V to 15V, Resolution 0.001V |

### Analog Output (AO)

**Table 5 - Object Table Information: Analog Value (AV)**

| ID   | Name                         | List       | Description                                | W?                              | Notes                        |
|------|------------------------------|------------|--------------------------------------------|---------------------------------|------------------------------|
| AO.3 | Power Output Feedback Signal | Integrator | Value of the power output feedback signal. | Out_of_Service<br>COV_Increment | 0V to 10V, Resolution 0.001V |

### Analog Value (AV)

**Table 5 - Object Table Information: Analog Value (AV)**

| ID    | Name                             | List       | Description                                                                                                                      | W?                              | Notes                                              |
|-------|----------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------|
| AV.10 | MCU Load                         | Integrator | Value of the current microcontroller load.                                                                                       | Out_of_Service<br>COV_Increment | 0% to 100%, Resolution 1%                          |
| AV.11 | Memory Load                      | Integrator | Value of the current memory load.                                                                                                | Out_of_Service<br>COV_Increment | 0% to 100%, Resolution 1%                          |
| AV.14 | Module 1 Manual Calibration Time | Integrator | Amount of time that has been elapsed since the last manual calibration of the water level sensor of the first humidifier module. | Read Only                       | 0 hours to 2147836.47 hours, Resolution 0.01 hours |

| ID    | Name                         | List       | Description                                                                                                                                                                                                | W?                                               | Notes                                 |
|-------|------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------|
| AV.37 | Water Level Replace Interval | Integrator | Configuration value to define the amount of time the humidifier may run using only the resistive water level probes, if there is an issue with the capacitive probe, before an alarm message is displayed. | Present_Value<br>Out_of_Service<br>COV_Increment | 0 to 7 days, Resolution 1 day         |
| AV.48 | Supply High Limit RH         | Integrator | Value of the duct or supply high limit humidity analog input.                                                                                                                                              | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.49 | Supply High Limit RH Min     | Integrator | Minimum value of the duct or supply high limit humidity analog input.                                                                                                                                      | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.50 | Supply High Limit RH Max     | Integrator | Maximum value of the duct or supply high limit humidity analog input.                                                                                                                                      | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.51 | Supply High Limit RH Bias    | Integrator | Bias value of the duct or supply high limit humidity analog input.                                                                                                                                         | Present_Value<br>Out_of_Service<br>COV_Increment | -10% RH to 10% RH, Resolution 0.1% RH |
| AV.54 | Room RH                      | Integrator | Value of the room humidity reading.                                                                                                                                                                        | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.55 | Room RH Min                  | Integrator | Minimum value of the room humidity analog input.                                                                                                                                                           | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.56 | Room RH Max                  | Integrator | Maximum value of the room humidity analog input.                                                                                                                                                           | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.57 | Room RH Bias                 | Integrator | Bias value of the room humidity analog input.                                                                                                                                                              | Present_Value<br>Out_of_Service<br>COV_Increment | -10% RH to 10% RH, Resolution 0.1% RH |
| AV.60 | Control Input                | Integrator | Value of the current control input reading.                                                                                                                                                                | Present_Value<br>Out_of_Service<br>COV_Increment | 0% to 100%, Resolution 0.1%           |
| AV.61 | Control Min                  | Integrator | Minimum value of the control demand analog input.                                                                                                                                                          | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.62 | Control Max                  | Integrator | Maximum value of the control demand analog input.                                                                                                                                                          | Present_Value<br>Out_of_Service<br>COV_Increment | 0% RH to 100% RH, Resolution 0.1% RH  |
| AV.63 | Control Bias                 | Integrator | Bias value of the control demand analog input.                                                                                                                                                             | Present_Value<br>Out_of_Service<br>COV_Increment | -10% to 10%, Resolution 0.1%          |

| ID    | Name                                      | List       | Description                                                                                          | W?                                                                     | Notes                          |
|-------|-------------------------------------------|------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------|
| AV.67 | Power Output Feedback Bias                | Integrator | Bias value for the power output feedback signal.                                                     | Present_Value<br>Out_of_Service<br>COV_Increment                       | -1V to 1V, Resolution 0.001V   |
| AV.68 | Power Output Feedback Min                 | Integrator | Minimum value of the power output feedback signal.                                                   | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0V to 10V, Resolution 0.001V   |
| AV.69 | Power Output Feedback Max                 | Integrator | Maximum value of the current steam output feedback.                                                  | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0V to 10V, Resolution 0.001V   |
| AV.70 | Power Output Feedback                     | Integrator | Feedback value of the power output analog output.                                                    | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 0.01%   |
| AV.73 | Module 1 Water Level                      | Integrator | Value of the percentage of water remaining in the evaporation chamber.                               | Out_of_Service<br>COV_Increment                                        | 0% to 200%, Resolution 1%      |
| AV.76 | Module 1 Water Probe Low Pos Reading      | Integrator | Displays the low position value of the water level sensor of the first humidifier module.            | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.77 | Module 1 Water Probe High Pos Reading     | Integrator | Displays the high position value of the water level sensor of the first humidifier module.           | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.80 | Module 1 Water Probe Abs Low Pos Reading  | Integrator | Displays the absolute low position value of the water level sensor of the first humidifier module.   | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.81 | Module 1 Water Probe Abs High Pos Reading | Integrator | Displays the absolute high position value of the water level sensor of the first humidifier module.  | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.82 | Module 2 Water Level                      | Integrator | Value of the percentage of water remaining in the evaporation chamber.                               | Out_of_Service<br>COV_Increment                                        | 0% to 120%, Resolution 1%      |
| AV.85 | Module 2 Water Probe Low Pos Reading      | Integrator | Displays the low position value of the water level sensor of the second humidifier module.           | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.86 | Module 2 Water Probe High Pos Reading     | Integrator | Displays the high position value of the water level sensor of the second humidifier module.          | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.89 | Module 2 Water Probe Abs Low Reading      | Integrator | Displays the absolute low position value of the water level sensor of the second humidifier module.  | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.90 | Module 2 Water Probe Abs High Pos Reading | Integrator | Displays the absolute high position value of the water level sensor of the second humidifier module. | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.91 | Module 3 Water Level                      | Integrator | Value of the percentage of water remaining in the evaporation chamber.                               | Out_of_Service<br>COV_Increment                                        | 0% to 120%, Resolution 1%      |
| AV.94 | Module 3 Water Probe Low Pos Reading      | Integrator | Displays the low position value of the water level sensor of the third humidifier module.            | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.95 | Module 3 Water Probe High Pos Reading     | Integrator | Displays the high position value of the water level sensor of the third humidifier module.           | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |
| AV.98 | Module 3 Water Probe Abs Low Pos Reading  | Integrator | Displays the absolute low position value of the water level sensor of the third humidifier module.   | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz |

| ID     | Name                                      | List       | Description                                                                                         | W?                                                                     | Notes                                    |
|--------|-------------------------------------------|------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------|
| AV.99  | Module 3 Water Probe Abs High Pos Reading | Integrator | Displays the absolute high position value of the water level sensor of the third humidifier module. | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz           |
| AV.100 | Module 4 Water Level                      | Integrator | Value of the percentage of water remaining in the evaporation chamber.                              | Out_of_Service<br>COV_Increment                                        | 0% to 200%, Resolution 0.1%              |
| AV.103 | Module 4 Water Probe Low Pos Reading      | Integrator | Displays the low position value of the water level sensor of the fourth humidifier module.          | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz           |
| AV.104 | Module 4 Water Probe High Pos Reading     | Integrator | Displays the high position value of the water level sensor of the first humidifier module.          | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz           |
| AV.107 | Module 4 Water Probe Abs Low Pos Reading  | Integrator | Displays the absolute low position value of the water level sensor of the first humidifier module.  | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz           |
| AV.108 | Module 4 Water Probe Abs High Pos Reading | Integrator | Displays the absolute high position value of the water level sensor of the first humidifier module. | COV_Increment                                                          | 0Hz to 30000Hz, Resolution 1Hz           |
| AV.109 | Room RH Network Reading                   | Integrator | Value of the room relative humidity reading received from the network.                              | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0.00% to 100.00%, Resolution 0.01%       |
| AV.110 | Room RH Setpoint                          | Integrator | Value of the room relative humidity setpoint received from the network.                             | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% RH to 100% RH, Resolution 0.10% RH    |
| AV.111 | Room RH Unoccupied Setpoint               | Integrator | Value of the room relative humidity reading received from the network during no occupancy state.    | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% RH to 100% RH, Resolution 0.10% RH    |
| AV.112 | Room RH Vacant Setpoint                   | Integrator | Value of the room relative humidity reading received from the network during vacancy.               | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% RH to 100% RH, Resolution 0.10% RH    |
| AV.113 | Room Demand Proportional Gain             | Integrator | Value of the room demand proportional gain.                                                         | Present_Value<br>Out_of_Service<br>COV_Increment                       | 1 to 200, Resolution 0.1                 |
| AV.114 | Room Demand Integral Time                 | Integrator | Value of the room demand integral time.                                                             | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 900 seconds, Resolution 0.5 seconds |
| AV.115 | Room Demand Derivative Time               | Integrator | Value of the room demand derivative time.                                                           | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 60 seconds, Resolution 0.1 second   |
| AV.123 | Room Demand                               | Integrator | Value of the humidity demand within the room.                                                       | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 1%                |
| AV.125 | Supply High Limit Network Reading         | Integrator | Value of the supply high limit reading received from the network.                                   | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0.00% to 100.00%, Resolution 0.01%       |

| ID     | Name                                | List       | Description                                                                                    | W?                                                                     | Notes                                                                         |
|--------|-------------------------------------|------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| AV.126 | Supply High Limit Setpoint          | Integrator | Value of the supply high limit setpoint received from the network.                             | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% RH to 100% RH, Resolution 0.10% RH                                         |
| AV.129 | Supply High Limit Proportional Gain | Integrator | Value of the supply high limit demand proportional gain.                                       | Present_Value<br>Out_of_Service<br>COV_Increment                       | 1 to 200, Resolution 0.1                                                      |
| AV.130 | Supply High Limit Integral Time     | Integrator | Value of the supply high limit demand integral time.                                           | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 900 seconds, Resolution 0.5 seconds                                      |
| AV.131 | Supply High Limit Derivative Time   | Integrator | Value of the supply high limit demand derivative time.                                         | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 60 seconds, Resolution 0.1 seconds                                       |
| AV.139 | Supply High Limit Demand            | Integrator | Supply high limit humidity demand value.                                                       | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 1%                                                     |
| AV.141 | Humidity Control Network Demand     | Integrator | Value of the humidity control demand received from the network.                                | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0.00% to 100.00%, Resolution 0.1%                                             |
| AV.142 | Humidity Control Network High Limit | Integrator | Value of the humidity control high limit received from the network.                            | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0.00% to 100.00%, Resolution 0.01%                                            |
| AV.146 | Humidity Demand                     | Integrator | Value of the current humidity demand.                                                          | Out_of_Service<br>COV_Increment<br>Relinquish_Default                  | 0% to 100%, Resolution 1%                                                     |
| AV.148 | System Power Output                 | Integrator | Displays the measured power output of the system as a percentage of the total power.           | Out_of_Service<br>COV_Increment                                        | 0% to 100%, Resolution 1%                                                     |
| AV.150 | Module 1 Chimney Temp               | Integrator | Value of the flue gas temperature value of the first humidifier module.                        | Present_Value<br>Out_of_Service<br>COV_Increment                       | 32.00°F to 500.00°F or 0.00°C to max: 260.00°C<br>Resolution 0.18°F or 0.10°C |
| AV.151 | Module 1 Water Temp                 | Integrator | Value of temperature of water in the evaporation chamber of the first humidifier module.       | Out_of_Service<br>COV_Increment<br>Units                               | 32°F to 257°F or 0°C to 125°C<br>Resolution 0.018°F or 0.01°C                 |
| AV.152 | Module 1 Water Frequency            | Integrator | Value of the input frequency of the water level sensor of the first humidifier module.         | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0Hz to 30000Hz, Resolution 1Hz                                                |
| AV.154 | Module 1 Ambient Temp               | Integrator | Value of the temperature inside of the weather proof enclosure of the first humidifier module. | Present_Value<br>Out_of_Service<br>COV_Increment                       | -40.00°F to 212.00°F or -40.00°C to 100.00°C<br>Resolution 0.18°F or 0.10°C   |

| ID     | Name                      | List       | Description                                                                                                        | W?                                                                     | Notes                                                                         |
|--------|---------------------------|------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| AV.155 | Module 1 Fan Feedback     | Integrator | Value from the burner fan feedback of the first humidifier module,                                                 | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 2000 Hz, Resolution 1 Hz                                                 |
| AV.156 | Module 1 Fan PWM          | Integrator | Value of the PWM control signal from the burner fan of the first humidifier module.                                | Out_of_Service<br>COV_Increment<br>Relinquish_Default                  | 0% to 100%, Resolution 0.10%                                                  |
| AV.158 | Module 1 Run Time         | Integrator | Value of the total runtime of the first humidifier module.                                                         | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours, Resolution 0.01 hours                        |
| AV.159 | Module 1 Service On Time  | Integrator | Value of the operating time of the first humidifier module, since the last servicing.                              | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours, Resolution 0.01 hours                        |
| AV.160 | Module 1 Service Run Time | Integrator | Value of the runtime of the first humidifier module, since the last servicing.                                     | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0.00 hours to 21474836.47 hours, Resolution 0.01 hours                        |
| AV.161 | Module 1 On Time          | Integrator | Value of the total operating time for the first humidifier module                                                  | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours, Resolution 0.01 hours                        |
| AV.162 | Module 1 Demand           | Integrator | Value of the measured humidity demand of the first humidifier module.                                              | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 0.01%                                                  |
| AV.166 | Module 1 Max Steam Output | Integrator | Configuration value of the maximum steam output of the first modulating humidifier relative to its total capacity. | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% to 100%, Resolution 5.00%                                                  |
| AV.170 | Module 2 Chimney Temp     | Integrator | Value of the flue gas temperature value of the second humidifier module.                                           | Present_Value<br>Out_of_Service<br>COV_Increment                       | 32.00°F to 500.00°F or 0.00°C to max: 260.00°C<br>Resolution 0.18°F or 0.10°C |
| AV.171 | Module 2 Water Temp       | Integrator | Value of temperature of water in the evaporation chamber of the second humidifier module.                          | Out_of_Service<br>COV_Increment<br>Units                               | 32°F to 257°F or 0°C to 125°C<br>Resolution 0.018°F or 0.01°C                 |
| AV.172 | Module 2 Water Frequency  | Integrator | Value of the input frequency of the water level sensor of the second humidifier module.                            | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0Hz to 30000Hz, Resolution 1Hz                                                |
| AV.174 | Module 2 Ambient Temp     | Integrator | Value of the temperature inside of the weather proof enclosure of the second humidifier module.                    | Present_Value<br>Out_of_Service<br>COV_Increment                       | -40.00°F to 212.00°F or -40.00°C to 100.00°C<br>Resolution 0.18°F or 0.10°C   |
| AV.175 | Module 2 Fan Feedback     | Integrator | Value from the burner fan feedback of the second humidifier module,                                                | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 2000 Hz, Resolution 1 Hz                                                 |
| AV.176 | Module 2 Fan PWM          | Integrator | Value of the PWM control signal from the burner fan of the second humidifier module.                               | Out_of_Service<br>COV_Increment<br>Relinquish_Default                  | 0% to 100%, Resolution 0.10%                                                  |

| ID     | Name                      | List       | Description                                                                                                         | W?                                                                     | Notes                                                                         |
|--------|---------------------------|------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| AV.178 | Module 2 Run Time         | Integrator | Value of the total runtime of the second humidifier module.                                                         | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.179 | Module 2 Service On Time  | Integrator | Value of the operating time of the second humidifier module, since the last servicing.                              | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.180 | Module 2 Service Run Time | Integrator | Value of the runtime of the second humidifier module, since the last servicing.                                     | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.181 | Module 2 On Time          | Integrator | Value of the total operating time for the second humidifier module                                                  | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.182 | Module 2 Demand           | Integrator | Value of the measured humidity demand of the second humidifier module.                                              | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 0.01%                                                  |
| AV.186 | Module 2 Max Steam Output | Integrator | Configuration value of the maximum steam output of the second modulating humidifier relative to its total capacity. | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% to 100%, Resolution 5.00%                                                  |
| AV.190 | Module 3 Chimney Temp     | Integrator | Value of the flue gas temperature value of the third humidifier module.                                             | Present_Value<br>Out_of_Service<br>COV_Increment                       | 32.00°F to 500.00°F or 0.00°C to max: 260.00°C<br>Resolution 0.18°F or 0.10°C |
| AV.191 | Module 3 Water Temp       | Integrator | Value of temperature of water in the evaporation chamber of the third humidifier module.                            | Out_of_Service<br>COV_Increment<br>Units                               | 32°F to 257°F or 0°C to 125°C<br>Resolution 0.018°F or 0.01°C                 |
| AV.192 | Module 3 Water Frequency  | Integrator | Value of the input frequency of the water level sensor of the third humidifier module.                              | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0Hz to 30000Hz, Resolution 1Hz                                                |
| AV.194 | Module 3 Ambient Temp     | Integrator | Value of the temperature inside of the weather proof enclosure of the third humidifier module.                      | Present_Value<br>Out_of_Service<br>COV_Increment                       | -40.00°F to 212.00°F or -40.00°C to 100.00°C<br>Resolution 0.18°F or 0.10°C   |
| AV.195 | Module 3 Fan Feedback     | Integrator | Value from the burner fan feedback of the third humidifier module.                                                  | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 2000 Hz, Resolution 1 Hz                                                 |
| AV.196 | Module 3 Fan PWM          | Integrator | Value of the PWM control signal from the burner fan of the third humidifier module.                                 | Out_of_Service<br>COV_Increment<br>Relinquish_Default                  | 0% to 100%, Resolution 0.10%                                                  |
| AV.198 | Module 3 Run Time         | Integrator | Value of the total runtime of the third humidifier module.                                                          | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.199 | Module 3 Service On Time  | Integrator | Value of the operating time of the third humidifier module, since the last servicing.                               | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |

| ID     | Name                      | List       | Description                                                                                                        | W?                                                                     | Notes                                                                         |
|--------|---------------------------|------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| AV.200 | Module 3 Service Run Time | Integrator | Value of the runtime of the third humidifier module, since the last servicing.                                     | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.201 | Module 3 On Time          | Integrator | Value of the total operating time for the third humidifier module                                                  | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.202 | Module 3 Demand           | Integrator | Value of the measured humidity demand of the third humidifier module.                                              | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 0.01%                                                  |
| AV.206 | Module 3 Max Steam Output | Integrator | Configuration value of the maximum steam output of the third modulating humidifier relative to its total capacity. | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% to 100%, Resolution 5.00%                                                  |
| AV.210 | Module 4 Chimney Temp     | Integrator | Value of the flue gas temperature value of the fourth humidifier module.                                           | Present_Value<br>Out_of_Service<br>COV_Increment                       | 32.00°F to 500.00°F or 0.00°C to max: 260.00°C<br>Resolution 0.18°F or 0.10°C |
| AV.211 | Module 4 Water Temp       | Integrator | Value of temperature of water in the evaporation chamber of the fourth humidifier module.                          | Out_of_Service<br>COV_Increment<br>Units                               | 32°F to 257°F or 0°C to 125°C<br>Resolution 0.018°F or 0.01°C                 |
| AV.212 | Module 4 Water Frequency  | Integrator | Value of the input frequency of the water level sensor of the fourth humidifier module.                            | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0Hz to 30000Hz, Resolution 1Hz                                                |
| AV.214 | Module 4 Ambient Temp     | Integrator | Value of the temperature inside of the weather proof enclosure of the fourth humidifier module.                    | Present_Value<br>Out_of_Service<br>COV_Increment                       | -40.00°F to 212.00°F or -40.00°C to 100.00°C<br>Resolution 0.18°F or 0.10°C   |
| AV.215 | Module 4 Fan Feedback     | Integrator | Value from the burner fan feedback of the fourth humidifier module,                                                | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 2000 Hz, Resolution 1 Hz                                                 |
| AV.216 | Module 4 Fan PWM          | Integrator | Value of the PWM control signal from the burner fan of the fourth humidifier module.                               | Out_of_Service<br>COV_Increment<br>Relinquish_Default                  | 0% to 100%, Resolution 0.10%                                                  |
| AV.218 | Module 4 Run Time         | Integrator | Value of the total runtime of the fourth humidifier module.                                                        | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.219 | Module 4 Service On Time  | Integrator | Value of the operating time of the fourth humidifier module, since the last servicing.                             | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.220 | Module 4 Service Run Time | Integrator | Value of the runtime of the fourth humidifier module, since the last servicing.                                    | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |
| AV.221 | Module 4 On Time          | Integrator | Value of the total operating time for the fourth humidifier module                                                 | Out_of_Service<br>COV_Increment                                        | 0.00 hours to 21474836.47 hours,<br>Resolution 0.01 hours                     |

| ID     | Name                             | List       | Description                                                                                                                                                          | W?                                                                     | Notes                                               |
|--------|----------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------|
| AV.222 | Module 4 Demand                  | Integrator | Value of the measured humidity demand of the fourth humidifier module.                                                                                               | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default | 0% to 100%, Resolution 0.01%                        |
| AV.226 | Module 4 Max Steam Output        | Integrator | Configuration value of the maximum steam output of the fourth modulating humidifier relative to its total capacity.                                                  | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% to 100%, Resolution 5.00%                        |
| AV.231 | Boiler Blowdown Rate             | Integrator | Configuration value of the rate of boiler blowdown or water dilution in order to minimize water impurities.                                                          | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% to 100%, Resolution 1%                           |
| AV.234 | Boiler Drain Interval            | Integrator | Configuration value to define the drain cycle.                                                                                                                       | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 24 hours, Resolution 1 hour                    |
| AV.235 | Boiler Idle Temperature Setpoint | Integrator | Configuration value of the idle temperature setpoint for the evaporation chamber when there is no demand.                                                            | Present_Value<br>Out_of_Service<br>COV_Increment<br>Units              | 32°F to 140°F or 0°C to 60°C, Resolution 2°F or 1°C |
| AV.236 | Boiler Idle Time Drain           | Integrator | Configuration value of the amount of time the humidifier can remain in standby mode until an automatic drain cycle is performed.                                     | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0 to 72 hours, Resolution 1 hour                    |
| AV.241 | Boiler Service Interval          | Integrator | Configuration value to define the time of operation before the humidifier calls for servicing.                                                                       | Present_Value<br>Out_of_Service<br>COV_Increment                       | 1000 to 3000 hours, Resolution 100 hours            |
| AV.248 | Network Timeout                  | Integrator | Configuration value to define the amount of time the humidifier may attempt to connect to the BACnet network before it stops operating due to a communication error. | Present_Value<br>Out_of_Service<br>COV_Increment                       | 1 to 900 seconds, Resolution 1 second               |
| AV.254 | Boiler Idle Tank Rinse Interval  | Integrator | Configuration value to define amount of time the humidifier stays in "Idle" or "Off" mode, before the evaporation chamber undergoes an automatic rinse cycle.        | Present_Value<br>Out_of_Service<br>COV_Increment                       | 1 to 7 days, Resolution 1 day                       |
| AV.255 | Boiler Minimum Steam Output      | Integrator | Configuration value of the minimum steam production demand value, below which no steam will be produced                                                              | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% to 25%, Resolution 1%                            |
| AV.256 | Boiler Drain Volume              | Integrator | Configuration value to define the volume of water that is drained from the chamber, relative to the total capacity of the chamber.                                   | Present_Value<br>Out_of_Service<br>COV_Increment                       | 25% to 100%, Resolution 5%                          |
| AV.270 | Humidity Demand Low Dead Band    | Integrator | Value of the lower limit deadband for the humidity demand.                                                                                                           | Present_Value<br>Out_of_Service<br>COV_Increment                       | 0% RH to 100%, Resolution 0.01%                     |
| AV.273 | Module 1 Ignition Count          | Integrator | Number of times that the first humidifier module has completed an ignition cycle.                                                                                    | Present_Value<br>Out_of_Service                                        | 0 to 214748364, Resolution 1                        |

| ID     | Name                              | List       | Description                                                                                                                                                                                       | W?                                                                              | Notes                                                                           |
|--------|-----------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| AV.274 | Module 2 Ignition Count           | Integrator | Number of times that the second humidifier module has completed an ignition cycle                                                                                                                 | Present_Value<br>Out_of_Service                                                 | 0 to 214748364, Resolution 1                                                    |
| AV.275 | Module 3 Ignition Count           | Integrator | Number of times that the third humidifier module has completed an ignition cycle                                                                                                                  | Present_Value<br>Out_of_Service                                                 | 0 to 214748364, Resolution 1                                                    |
| AV.276 | Module 4 Ignition Count           | Integrator | Number of times that the fourth humidifier module has completed an ignition cycle                                                                                                                 | Present_Value<br>Out_of_Service                                                 | 0 to 214748364, Resolution 1                                                    |
| AV.281 | HRL Temperature                   | Integrator | Value of the room temperature measured by the HRL24 controller.                                                                                                                                   | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default<br>Units | -40°F to 500°F or -40°C to 260°C<br>Resolution 0.18°F or 0.10°C                 |
| AV.282 | HRL Humidity                      | Integrator | Value of the room humidity measured by the HRL24 controller.                                                                                                                                      | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default<br>Units | 0% RH to 100% RH, Resolution 0.1% RH                                            |
| AV.285 | Runtime                           | Integrator | The number of seconds that the system has been powered on. This value is reset every time the system is shut off.                                                                                 | Present_Value<br>Out_of_Service<br>COV_Increment<br>Relinquish_Default<br>Units | 0 to 999999999 seconds, Resolution 1 second                                     |
| AV.291 | Room Demand Proportional Band     | Integrator | Value of the room demand proportional band.                                                                                                                                                       | Present_Value<br>Out_of_Service<br>COV_Increment                                | 1% to 100%, Resolution 0.1%                                                     |
| AV.303 | Module 1 Water Temperature Offset | Integrator | Configuration value to set the temperature offset for the first evaporation chamber water temperature value, in order to adjust the reading of the temperature sensor to the proper temperature.  | Present_Value<br>Out_of_Service<br>COV_Increment                                | -18.00°F to 18.00°F or -10.00°C to max: 10.00°C<br>Resolution 0.018°F or 0.01°C |
| AV.304 | Module 2 Water Temperature Offset | Integrator | Configuration value to set the temperature offset for the second evaporation chamber water temperature value, in order to adjust the reading of the temperature sensor to the proper temperature. | Present_Value<br>Out_of_Service<br>COV_Increment                                | -18.00°F to 18.00°F or -10.00°C to max: 10.00°C<br>Resolution 0.018°F or 0.01°C |
| AV.305 | Module 3 Water Temperature Offset | Integrator | Configuration value to set the temperature offset for the third evaporation chamber water temperature value, in order to adjust the reading of the temperature sensor to the proper temperature.  | Present_Value<br>Out_of_Service<br>COV_Increment                                | -18.00°F to 18.00°F or -10.00°C to max: 10.00°C<br>Resolution 0.018°F or 0.01°C |
| AV.306 | Module 4 Water Temperature Offset | Integrator | Configuration value to set the temperature offset for the fourth evaporation chamber water temperature value, in order to adjust the reading of the temperature sensor to the proper temperature. | Present_Value<br>Out_of_Service<br>COV_Increment                                | -18.00°F to 18.00°F or -10.00°C to max: 10.00°C<br>Resolution 0.018°F or 0.01°C |
| AV.309 | Modbus TCP IP Keep Alive Time Out | Integrator | Configuration value to define the amount of time the communication to the Modbus TCP/IP server stays open before connection is cut out, when no signal is received from the device.               | Present_Value<br>Out_of_Service<br>COV_Increment                                | 1 to 1440 minutes, Resolution 1 minute                                          |

| ID     | Name                             | List       | Description                                                                                                                       | W?        | Notes                                        |
|--------|----------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------|
| AV.323 | Module 2 Manual Calibration Time | Integrator | Amount of time that has been elapsed since the last manual calibration of the water level sensor of the second humidifier module. | Read Only | 0 to 21474836.47 hours, Resolution 0.01 hour |
| AV.324 | Module 3 Manual Calibration Time | Integrator | Amount of time that has been elapsed since the last manual calibration of the water level sensor of the third humidifier module.  | Read Only | 0 to 21474836.47 hours, Resolution 0.01 hour |
| AV.325 | Module 4 Manual Calibration Time | Integrator | Amount of time that has been elapsed since the last manual calibration of the water level sensor of the fourth humidifier module. | Read Only | 0 to 21474836.47 hours, Resolution 0.01 hour |

## Binary Input (BI)

**Table 5 - Object Table Information: Binary Input (BI)**

| ID    | Name                   | List       | Description                                                                                                                                                        | W?                         | Notes                  |
|-------|------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------|
| BI.1  | Water Leak Detection   | Integrator | Displays whether a water leak has been detected.                                                                                                                   | Out_of_Service<br>Polarity | 0 = OK<br>1 = Leak     |
| BI.5  | Binary External Demand | Integrator | Displays whether there is currently a humidity demand, when an On/Off humidifier is used.                                                                          | Out_of_Service<br>Polarity | 0 = 0%<br>1 = 100%     |
| BI.6  | Interlock              | Integrator | Displays the status of the interlock. If the switch is Open, it indicates that the humidifier is stopped as a result of the interlock safety being open.           | Out_of_Service<br>Polarity | 0 = Closed<br>1 = Open |
| BI.7  | Supply High Limit      | Integrator | Displays the status of the high limit contact. If the switch is Open, it indicates that the humidity level has exceeded the setpoint on the high limit humidistat. | Out_of_Service<br>Polarity | 0 = Closed<br>1 = Open |
| BI.8  | Air Flow               | Integrator | Displays the status of the airflow switch. If the switch is Open, it indicates that the airflow is not detected by the air pressure switch.                        | Out_of_Service<br>Polarity | 0 = Closed<br>1 = Open |
| BI.9  | RS485 Interface        | Integrator | Displays whether the RS485 interface is available or not.                                                                                                          | Out_of_Service<br>Polarity | 0 = No<br>1 = Yes      |
| BI.10 | Ethernet Interface     | Integrator | Displays whether the Ethernet interface is available or not.                                                                                                       | Out_of_Service<br>Polarity | 0 = No<br>1 = Yes      |

## Binary Output (BO)

**Table 6 - Object Table Information: Binary Output (BO)**

| ID   | Name                  | List       | Description                                 | W?                                                                                                       | Notes             |
|------|-----------------------|------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------|
| BO.1 | Service Warning Relay | Integrator | Status value for the service warning relay. | Present_Value<br>Out_of_Service<br>Polarity<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On |
| BO.2 | Alarm Warning Relay   | Integrator | Status value for the alarm warning relay.   | Present_Value<br>Out_of_Service<br>Polarity<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On |
| BO.5 | Alarm LED             | Integrator | Status value for the alarm LED.             | Present_Value<br>Out_of_Service<br>Polarity<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On |
| BO.6 | Power LED             | Integrator | Status value for the power LED.             | Present_Value<br>Out_of_Service<br>Polarity<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On |
| BO.7 | Buzzer                | Integrator | Status value for the buzzer.                | Present_Value<br>Out_of_Service<br>Polarity<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On |

## Binary Value (BV)

**Table 7 - Object Table Information: Binary Value (BV)**

| ID    | Name                           | List       | Description                                                                                                                                                                                 | W?                                                                                           | Notes                      |
|-------|--------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| BV.2  | Alarm Buzzer                   | Integrator | Configuration value that enables or disables the alarm buzzer sound when there is a system warning.                                                                                         | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Normal<br>1 = Disabled |
| BV.33 | Module 1 Burner Inlet Pressure | Integrator | Status value of the burner inlet air pressure switch of the first humidifier module.                                                                                                        | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Normal<br>1 = Blocked  |
| BV.34 | Module 1 Water Level Low       | Integrator | Status value for the resistive low water level sensor of the first humidifier module.                                                                                                       | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.35 | Module 1 Water Level High      | Integrator | Status value for the resistive high water level sensor of the first humidifier module.                                                                                                      | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.36 | Module 1 Foam Sensor           | Integrator | Displays whether foam has been detected within the first evaporation chamber. If Foam is displayed, it indicates that the Anti-Foaming Energy Conservation (AFEC) system has detected foam. | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = NoFoam<br>1 = Foam     |
| BV.39 | Module 1 Gas Valve             | Integrator | Status value of the gas valve of the first humidifier module.                                                                                                                               | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Off<br>1 = On          |
| BV.40 | Module 1 Tank Water Valve      | Integrator | Status value of the evaporation chamber water supply valve of the first humidifier module.                                                                                                  | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.41 | Module 1 Water Level Valve     | Integrator | Status value of the water level sensor supply valve of the first humidifier module.                                                                                                         | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.42 | Module 1 Drain Cooler Valve    | Integrator | Status value of the internal drain cooler valve of the first humidifier module.                                                                                                             | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.43 | Module 1 Drain Pump            | Integrator | Status value of the drain pump of the first humidifier module.                                                                                                                              | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |

| ID    | Name                           | List       | Description                                                                                                                                                                                  | W?                                                                                           | Notes                      |
|-------|--------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| BV.45 | Module 1 Ignition Control      | Integrator | Status value of the ignition control module of the first humidifier module.                                                                                                                  | Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                  | 0 = Off<br>1 = On          |
| BV.47 | Module 1 Alarm LED             | Integrator | Status value for the alarm LED of the first humidifier module.                                                                                                                               | Present_Value<br>Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.48 | Module 2 Burner Inlet Pressure | Integrator | Status value of the burner inlet air pressure switch of the second humidifier module.                                                                                                        | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Normal<br>1 = Blocked  |
| BV.49 | Module 2 Water Level Low       | Integrator | Status value for the resistive low water level sensor of the second humidifier module.                                                                                                       | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.50 | Module 2 Water Level High      | Integrator | Status value for the resistive high water level sensor of the second humidifier module.                                                                                                      | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.51 | Module 2 Foam Sensor           | Integrator | Displays whether foam has been detected within the second evaporation chamber. If Foam is displayed, it indicates that the Anti-Foaming Energy Conservation (AFEC) system has detected foam. | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = NoFoam<br>1 = Foam     |
| BV.54 | Module 2 Gas Valve             | Integrator | Status value of the gas valve of the second humidifier module.                                                                                                                               | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Off<br>1 = On          |
| BV.55 | Module 2 Tank Water Valve      | Integrator | Status value of the evaporation chamber water supply valve of the second humidifier module.                                                                                                  | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.56 | Module 2 Water Level Valve     | Integrator | Status value of the water level sensor supply valve of the second humidifier module.                                                                                                         | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.57 | Module 2 Drain Cooler Valve    | Integrator | Status value of the internal drain cooler valve of the second humidifier module.                                                                                                             | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |

| ID    | Name                           | List       | Description                                                                                                                                                                                 | W?                                                                                           | Notes                      |
|-------|--------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| BV.58 | Module 2 Drain Pump            | Integrator | Status value of the drain pump of the second humidifier module.                                                                                                                             | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.60 | Module 2 Ignition Control      | Integrator | Status value of the ignition control module of the second humidifier module.                                                                                                                | Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                  | 0 = Off<br>1 = On          |
| BV.62 | Module 2 Alarm LED             | Integrator | Status value for the alarm LED of the second humidifier module.                                                                                                                             | Present_Value<br>Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.63 | Module 3 Burner Inlet Pressure | Integrator | Status value of the burner inlet air pressure switch of the third humidifier module.                                                                                                        | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Normal<br>1 = Blocked  |
| BV.64 | Module 3 Water Level Low       | Integrator | Status value for the resistive low water level sensor of the third humidifier module.                                                                                                       | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.65 | Module 3 Water Level High      | Integrator | Status value for the resistive high water level sensor of the third humidifier module.                                                                                                      | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.66 | Module 3 Foam Sensor           | Integrator | Displays whether foam has been detected within the third evaporation chamber. If Foam is displayed, it indicates that the Anti-Foaming Energy Conservation (AFEC) system has detected foam. | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = NoFoam<br>1= Foam      |
| BV.69 | Module 3 Gas Valve             | Integrator | Status value of the gas valve of the third humidifier module.                                                                                                                               | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Off<br>1 = On          |
| BV.70 | Module 3 Tank Water Valve      | Integrator | Status value of the evaporation chamber water supply valve of the third humidifier module.                                                                                                  | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.71 | Module 3 Water Level Valve     | Integrator | Status value of the water level sensor supply valve of the third humidifier module.                                                                                                         | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |

| ID    | Name                           | List       | Description                                                                                                                                                                                  | W?                                                                                           | Notes                      |
|-------|--------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| BV.72 | Module 3 Drain Cooler Valve    | Integrator | Status value of the internal drain cooler valve of the third humidifier module.                                                                                                              | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.73 | Module 3 Drain Pump            | Integrator | Status value of the drain pump of the third humidifier module.                                                                                                                               | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.75 | Module 3 Ignition Control      | Integrator | Status value of the ignition control module of the third humidifier module.                                                                                                                  | Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                  | 0 = Off<br>1 = On          |
| BV.77 | Module 3 Alarm LED             | Integrator | Status value for the alarm LED of the third humidifier module.                                                                                                                               | Present_Value<br>Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |
| BV.78 | Module 4 Burner Inlet Pressure | Integrator | Status value of the burner inlet air pressure switch of the third humidifier module.                                                                                                         | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Normal<br>1 = Blocked  |
| BV.79 | Module 4 Water Level Low       | Integrator | Status value for the resistive low water level sensor of the fourth humidifier module.                                                                                                       | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.80 | Module 4 Water Level High      | Integrator | Status value for the resistive high water level sensor of the fourth humidifier module.                                                                                                      | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Inactive<br>1 = Active |
| BV.81 | Module 4 Foam Sensor           | Integrator | Displays whether foam has been detected within the fourth evaporation chamber. If Foam is displayed, it indicates that the Anti-Foaming Energy Conservation (AFEC) system has detected foam. | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = NoFoam<br>1 = Foam     |
| BV.84 | Module 4 Gas Valve             | Integrator | Status value of the gas valve of the fourth humidifier module.                                                                                                                               | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Off<br>1 = On          |
| BV.85 | Module 4 Tank Water Valve      | Integrator | Status value of the evaporation chamber water supply valve of the fourth humidifier module.                                                                                                  | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On          |

| ID     | Name                        | List       | Description                                                                                                                                                                                          | W?                                                                                           | Notes                          |
|--------|-----------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------------|
| BV.86  | Module 4 Water Level Valve  | Integrator | Status value of the water level sensor supply valve of the fourth humidifier module.                                                                                                                 | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On              |
| BV.87  | Module 4 Drain Cooler Valve | Integrator | Status value of the internal drain cooler valve of the fourth humidifier module.                                                                                                                     | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On              |
| BV.88  | Module 4 Drain Pump         | Integrator | Status value of the drain pump of the fourth humidifier module.                                                                                                                                      | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On              |
| BV.90  | Module 4 Ignition Control   | Integrator | Status value of the ignition control module of the fourth humidifier module.                                                                                                                         | Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                  | 0 = Off<br>1 = On              |
| BV.92  | Module 4 Alarm LED          | Integrator | Status value for the alarm LED of the fourth humidifier module.                                                                                                                                      | Present_Value<br>Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On              |
| BV.94  | Boiler Service Operation    | Integrator | Select whether to enable the humidifier to continue producing steam, even when it is due for servicing. When set to Allowed, the humidifier continues operating even when a service alarm is active. | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Not Allowed<br>1 = Allowed |
| BV.95  | Module 1 Foam State         | Integrator | Displays whether the first humidifier module has currently detected foam or not. If foam has been detected, the humidifier will perform a drain cycle.                                               | Read Only                                                                                    | 0 = Ok<br>1 = Detected         |
| BV.97  | Module 1 Service Due        | Integrator | Status value that indicates whether the first humidifier module is due for servicing.                                                                                                                | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Off<br>1 = Module1         |
| BV.98  | Module 2 Service Due        | Integrator | Status value that indicates whether the second humidifier module is due for servicing.                                                                                                               | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Off<br>1 = Module2         |
| BV.99  | Module 3 Service Due        | Integrator | Status value that indicates whether the third humidifier module is due for servicing.                                                                                                                | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Off<br>1 = Module3         |
| BV.100 | Module 4 Service Due        | Integrator | Status value that indicates whether the fourth humidifier module is due for servicing.                                                                                                               | Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                                        | 0 = Off<br>1 = Module4         |

| ID     | Name                      | List       | Description                                                                                                                                                                                                                                                          | W?                                                                                           | Notes                   |
|--------|---------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------|
| BV.104 | Network Control State     | Integrator | Indicates the state of the control communication between the device and the BACnet network.                                                                                                                                                                          | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = Normal<br>1 = Fault |
| BV.105 | Module 2 Foam State       | Integrator | Displays whether the second humidifier module has currently detected foam or not. If foam has been detected, the humidifier will perform a drain cycle.                                                                                                              | Read Only                                                                                    | 0 = Ok<br>1 = Detected  |
| BV.106 | Module 3 Foam State       | Integrator | Displays whether the third humidifier module has currently detected foam or not. If foam has been detected, the humidifier will perform a drain cycle.                                                                                                               | Read Only                                                                                    | 0 = Ok<br>1 = Detected  |
| BV.107 | Module 4 Foam State       | Integrator | Displays whether the fourth humidifier module has currently detected foam or not. If foam has been detected, the humidifier will perform a drain cycle.                                                                                                              | Read Only                                                                                    | 0 = Ok<br>1 = Detected  |
| BV.109 | HRL Lock Setpoint         | Integrator | Select whether the setpoint obtained from the HRL24 controller can be modified.                                                                                                                                                                                      | Present_Value<br>Relinquish_Default<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Unlock<br>1 = Lock  |
| BV.111 | Module 1 Drain Valve      | Integrator | Status value of the normally open drain valve of the first humidifier module.                                                                                                                                                                                        | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = On<br>1 = Off       |
| BV.112 | Module 2 Drain Valve      | Integrator | Status value of the normally open drain valve of the second humidifier module.                                                                                                                                                                                       | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = On<br>1 = Off       |
| BV.113 | Module 3 Drain Valve      | Integrator | Status value for the normally open drain valve of the third humidifier module.                                                                                                                                                                                       | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = On<br>1 = Off       |
| BV.114 | Module 4 Drain Valve      | Integrator | Status value for the normally open drain valve fourth humidifier module.                                                                                                                                                                                             | Present_Value<br>Out_of_Service<br>Relinquish_Default<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = On<br>1 = Off       |
| BV.119 | Inhibit Resistive Probe 1 | Integrator | Select whether to disable the resistive water level sensor probes or not for the first humidifier module. When performing a manual calibration procedure for the water level sensor or when using the ultrapure humidifier option, this setting must be set to Yes.  | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = No<br>1 = Yes       |
| BV.120 | Inhibit Resistive Probe 2 | Integrator | Select whether to disable the resistive water level sensor probes or not for the second humidifier module. When performing a manual calibration procedure for the water level sensor or when using the ultrapure humidifier option, this setting must be set to Yes. | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time                       | 0 = No<br>1 = Yes       |

| ID     | Name                                    | List       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                  | W?                                                                     | Notes                  |
|--------|-----------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------|
| BV.121 | Inhibit Resistive Probe 3               | Integrator | Select whether to disable the resistive water level sensor probes or not for the third humidifier module. When performing a manual calibration procedure for the water level sensor or when using the ultrapure humidifier option, this setting must be set to Yes.                                                                                                                                                                          | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = No<br>1 = Yes      |
| BV.122 | Inhibit Resistive Probe 4               | Integrator | Select whether to disable the resistive water level sensor probes or not for the fourth humidifier module. When performing a manual calibration procedure for the water level sensor or when using the ultrapure humidifier option, this setting must be set to Yes.                                                                                                                                                                         | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = No<br>1 = Yes      |
| BV.129 | SMTP SSL                                | Integrator | Select whether to use a secure socket layer encrypt the communication between the device and the email server or to use the default socket. If turned to <i>On</i> , SMTP Port value must be set to 587 and <i>SMTP Username</i> and <i>SMTP Password</i> settings must be filled out. If turned to <i>Off</i> , use SMTP Port 25 to use server without login account or SMTP Port 587 if login details for email account have been entered. | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On      |
| BV.130 | SMTP Port                               | Integrator | Select the port number to be used for email transfer. If set to 25, server to server email transfer is enabled (can only be used if SMTP SSL is set to <i>Off</i> ). If set to 587, client to server email transfer is enabled.                                                                                                                                                                                                              | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = 25<br>1 = 587      |
| BV.131 | Notify Alarm                            | Integrator | Select whether to get notified of all humidifier alarm messages by email.                                                                                                                                                                                                                                                                                                                                                                    | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On      |
| BV.132 | Notify Warning                          | Integrator | Select whether to get notified of all humidifier warning messages by email.                                                                                                                                                                                                                                                                                                                                                                  | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On      |
| BV.133 | Notify App Msg                          | Integrator | Select whether to get notified of all humidifier event messages by email.                                                                                                                                                                                                                                                                                                                                                                    | Present_Value<br>Out_of_Service<br>Minimum_Off_Time<br>Minimum_On_Time | 0 = Off<br>1 = On      |
| BV.143 | Module 1 Manual Water Calibration State | Integrator | Status value to indicate that the water level sensor must be manually calibrated.                                                                                                                                                                                                                                                                                                                                                            | Read Only                                                              | 0 = Ok<br>1 = Required |
| BV.144 | Module 2 Manual Water Calibration State | Integrator | Status value to indicate that the water level sensor must be manually calibrated.                                                                                                                                                                                                                                                                                                                                                            | Read Only                                                              | 0 = Ok<br>1 = Required |
| BV.145 | Module 3 Manual Water Calibration State | Integrator | Status value to indicate that the water level sensor must be manually calibrated.                                                                                                                                                                                                                                                                                                                                                            | Read Only                                                              | 0 = Ok<br>1 = Required |
| BV.146 | Module 4 Manual Water Calibration State | Integrator | Status value to indicate that the water level sensor must be manually calibrated.                                                                                                                                                                                                                                                                                                                                                            | Read Only                                                              | 0 = OK<br>1 = Required |

## Character String Value (CV)

**Table 8 - Object Table Information: Character String Value (CV)**

| ID    | Name                   | List       | Description                                                                        | W?            | Notes |
|-------|------------------------|------------|------------------------------------------------------------------------------------|---------------|-------|
| CV.10 | HMIOverwrite           | Integrator | Overwrite the value displayed on the local display menu.                           | Present_Value | -     |
| CV.21 | SMTP Server IP Address | Integrator | Configure the server IP address for the email account.                             | Present_Value | -     |
| CV.22 | SMTP Mail From         | Integrator | Set the email address that will be sending the humidifier notification messages.   | Present_Value | -     |
| CV.24 | SMTP Mail To           | Integrator | Set the email address that will be receiving the humidifier notification messages. | Present_Value | -     |
| CV.26 | SMTP Username          | Integrator | Set the login username for the email account.                                      | Present_Value | -     |
| CV.27 | SMTP Password          | Integrator | Set the login password for the email account.                                      | Present_Value | -     |
| CV.38 | EthernetMacAdd         | Integrator | Value of the MAC address of the Ethernet interface.                                | Present_Value | -     |

## Multi State Value (MSV)

**Table 9 - Object Table Information: Multi State Value (MSV)**

| ID     | Name                             | List       | Description                                                                                                                                                         | W?                              | Notes                                                                                                        |
|--------|----------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------|
| MSV.9  | BACnet Server List Mode          | Integrator | Configuration value to select the category of BACnet objects to display.                                                                                            | Present_Value<br>Out_of_Service | 1 = Integrator<br>2 = Advanced<br>3 = Factory                                                                |
| MSV.10 | BACnet Server Units              | Integrator | Configuration value to select the display units for the BACnet server.                                                                                              | Present_Value<br>Out_of_Service | 1 = Metric<br>2 = Imperial                                                                                   |
| MSV.26 | Supply RH Signal Type            | Integrator | Configuration value to select the signal type for the duct or supply high limit humidity analog input.                                                              | Present_Value<br>Out_of_Service | 1 = 0-10Vdc<br>2 = 2-10Vdc<br>3 = 4-20mA<br>4 = 0-20mA                                                       |
| MSV.27 | Room RH Signal Type              | Integrator | Configuration value to select the signal type for the room humidity analog input.                                                                                   | Present_Value<br>Out_of_Service | 1 = 0-10Vdc<br>2 = 2-10Vdc<br>3 = 4-20mA<br>4 = 0-20mA                                                       |
| MSV.28 | Control Signal Type              | Integrator | Configuration value to select the signal type for the control demand analog input.                                                                                  | Present_Value<br>Out_of_Service | 1 = 0-10Vdc<br>2 = 2-10mA<br>3 = 4-30mA<br>4 = 0-20mA                                                        |
| MSV.33 | Control Profile                  | Integrator | Configuration value to select a preconfigured control mode profile for the modulating humidity demand. Select the Custom option to configure individual settings.   | Present_Value<br>Out_of_Service | 1 = ExternAnalog<br>2 = ExternNetwork<br>3 = InternAnalog<br>4 = InternNetwork<br>5 = HRL<br>6 = Custom      |
| MSV.34 | Modulating High Limit Profile    | Integrator | Configuration value to select a preconfigured control mode profile for the modulating high limit demand. Select the Custom option to configure individual settings. | Present_Value<br>Out_of_Service | 1 = Disabled<br>2 = ExternAnalog<br>3 = ExternNetwork<br>4 = InternAnalog<br>5 = InternNetwork<br>6 = Custom |
| MSV.37 | Occupancy State                  | Integrator | Displays the current occupancy state.                                                                                                                               | Out_of_Service                  | 1 = Occupied<br>2 = Unoccupied<br>3 = Vacant<br>4 = Off                                                      |
| MSV.38 | Room RH Source                   | Integrator | Configuration value to select the reading source for the room demand.                                                                                               | Present_Value<br>Out_of_Service | 1 = None<br>2 = RoomRH<br>3 = Network                                                                        |
| MSV.39 | Room RH Setpoint Source          | Integrator | Configuration value to select the room demand setpoint source.                                                                                                      | Present_Value<br>Out_of_Service | 1 = None<br>2 = Internal<br>3 = ControllInput                                                                |
| MSV.43 | Supply High Limit Reading Source | Integrator | Configuration value to select the reading source for the supply high limit demand.                                                                                  | Present_Value<br>Out_of_Service | 1 = None<br>2 = SupplyHLRH<br>3 = Network                                                                    |

| ID     | Name                               | List       | Description                                                                                                                                                                                                                                           | W?                              | Notes                                                                                                                                            |
|--------|------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| MSV.44 | Supply High Limit Setpoint Source  | Integrator | Configuration value to select the supply high limit demand setpoint source.                                                                                                                                                                           | Present_Value<br>Out_of_Service | 1 = None<br>2 = Internal<br>3 = ControllInput                                                                                                    |
| MSV.48 | Humidity Control Demand Source     | Integrator | Configuration value to select the humidity control demand source.                                                                                                                                                                                     | Present_Value<br>Out_of_Service | 1 = None<br>2 = ControllInput<br>3 = RoomDemand<br>4 = Network                                                                                   |
| MSV.49 | Humidity Control High Limit Source | Integrator | Configuration value to select the humidity control high limit source.                                                                                                                                                                                 | Present_Value<br>Out_of_Service | 1 = None<br>2 = ControllInput<br>3 = SupplyHLDemand<br>4 = Network                                                                               |
| MSV.56 | Humidity Control Cutout State      | Integrator | Displays the current state of the safety control circuit and whether the circuit has been disconnected due to a safety switch.                                                                                                                        | Out_of_Service                  | 1 = Off<br>2 = Normal<br>3 = LowLimit<br>4 = HighLimit<br>5 = AirFlow<br>6 = Interlock                                                           |
| MSV.60 | System Power State                 | Integrator | Displays whether the system is powered on or off.                                                                                                                                                                                                     | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                |
| MSV.61 | System Request                     | Integrator | Select whether to perform one of the following actions for the system: reset service counters, initiate a drain cycle, reset warning alarms, fill the evaporation chamber, calibrate the water level sensor or perform an air purge.                  | Present_Value<br>Out_of_Service | 1 = None<br>2 = Reset Alarms<br>3 = Drain<br>4 = Reset Counters<br>5 = Filling<br>6 = WaterCalib<br>7 = PurgeAir                                 |
| MSV.63 | Module 1 State                     | Integrator | Displays the current state of operation of the first humidifier module.                                                                                                                                                                               | Out_of_Service                  | 1 = Off<br>2 = Idle<br>3 = LineRinse<br>4 = TankRinse<br>5 = Filling<br>6 = Draining<br>7 = Heating<br>8 = Boiling<br>9 = Alarm<br>10 = PurgeAir |
| MSV.64 | Module 1 Request                   | Integrator | Select whether to perform one of the following actions for the first humidifier module: reset service counters, initiate a drain cycle, reset warning alarms, fill the evaporation chamber, calibrate the water level sensor or perform an air purge. | Present_Value<br>Out_of_Service | 1 = None<br>2 = Reset Alarms<br>3 = Drain<br>4 = Reset Counters<br>5 = Filling<br>6 = WaterCalib<br>7 = PurgeAir                                 |

| ID     | Name             | List       | Description                                                                                                                                                                                                                                            | W?                              | Notes                                                                                                                                                                                                                                                                                                                                  |
|--------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MSV.65 | Module 1 Alarm   | Integrator | Displays the current status of the first humidifier's alarm.                                                                                                                                                                                           | Out_of_Service                  | 1 = Normal<br>2 = FailedPump<br>3 = FillTimeout<br>4 = Blocked Piping<br>5 = HeatTimeout<br>6 = Overheat<br>7 = WaterLeak<br>8 = Service<br>9 = Foaming<br>10 = BurnerLocked<br>11 = FanDefect<br>12 = FailedComm<br>13 = ChimTempHi<br>14 = RefillTimeout<br>15 = FanBlocked<br>16 = SystBlck<br>17 = TankBlocked<br>18 = RefillDelay |
| MSV.66 | Module 2 State   | Integrator | Displays the current state of operation of the second humidifier module.                                                                                                                                                                               | Out_of_Service                  | 1 = Off<br>2 = Idle<br>3 = LineRinse<br>4 = TankRinse<br>5 = Filling<br>6 = Draining<br>7 = Heating<br>8 = Boiling<br>9 = Alarm<br>10 = PurgeAir                                                                                                                                                                                       |
| MSV.67 | Module 2 Request | Integrator | Select whether to perform one of the following actions for the second humidifier module: reset service counters, initiate a drain cycle, reset warning alarms, fill the evaporation chamber, calibrate the water level sensor or perform an air purge. | Present_Value<br>Out_of_Service | 1 = None<br>2 = Reset Alarms<br>3 = Drain<br>4 = Reset Counters<br>5 = Filling<br>6 = WaterCalib<br>7 = PurgeAir                                                                                                                                                                                                                       |

| ID     | Name             | List       | Description                                                                                                                                                                                                                                           | W?                              | Notes                                                                                                                                                                                                                                                                                                                                  |
|--------|------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MSV.68 | Module 2 Alarm   | Integrator | Displays the current status of the second humidifier's alarm.                                                                                                                                                                                         | Out_of_Service                  | 1 = Normal<br>2 = FailedPump<br>3 = FillTimeout<br>4 = Blocked Piping<br>5 = HeatTimeout<br>6 = Overheat<br>7 = WaterLeak<br>8 = Service<br>9 = Foaming<br>10 = BurnerLocked<br>11 = FanDefect<br>12 = FailedComm<br>13 = ChimTempHi<br>14 = RefillTimeout<br>15 = FanBlocked<br>16 = SystBlck<br>17 = TankBlocked<br>18 = RefillDelay |
| MSV.69 | Module 3 State   | Integrator | Displays the current state of operation of the third humidifier module.                                                                                                                                                                               | Out_of_Service                  | 1 = Off<br>2 = Idle<br>3 = LineRinse<br>4 = TankRinse<br>5 = Filling<br>6 = Draining<br>7 = Heating<br>8 = Boiling<br>9 = Alarm<br>10 = PurgeAir                                                                                                                                                                                       |
| MSV.70 | Module 3 Request | Integrator | Select whether to perform one of the following actions for the third humidifier module: reset service counters, initiate a drain cycle, reset warning alarms, fill the evaporation chamber, calibrate the water level sensor or perform an air purge. | Present_Value<br>Out_of_Service | 1 = None<br>2 = Reset Alarms<br>3 = Drain<br>4 = Reset Counters<br>5 = Filling<br>6 = WaterCalib<br>7 = PurgeAir                                                                                                                                                                                                                       |

| ID     | Name             | List       | Description                                                                                                                                                                                                                                            | W?                              | Notes                                                                                                                                                                                                                                                                                                                                  |
|--------|------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MSV.71 | Module 3 Alarm   | Integrator | Displays the current status of the third humidifier's alarm.                                                                                                                                                                                           | Out_of_Service                  | 1 = Normal<br>2 = FailedPump<br>3 = FillTimeout<br>4 = Blocked Piping<br>5 = HeatTimeout<br>6 = Overheat<br>7 = WaterLeak<br>8 = Service<br>9 = Foaming<br>10 = BurnerLocked<br>11 = FanDefect<br>12 = FailedComm<br>13 = ChimTempHi<br>14 = RefillTimeout<br>15 = FanBlocked<br>16 = SystBlck<br>17 = TankBlocked<br>18 = RefillDelay |
| MSV.72 | Module 4 State   | Integrator | Displays the current state of operation of the fourth humidifier module.                                                                                                                                                                               | Out_of_Service                  | 1 = Off<br>2 = Idle<br>3 = LineRinse<br>4 = TankRinse<br>5 = Filling<br>6 = Draining<br>7 = Heating<br>8 = Boiling<br>9 = Alarm<br>10 = PurgeAir                                                                                                                                                                                       |
| MSV.73 | Module 4 Request | Integrator | Select whether to perform one of the following actions for the fourth humidifier module: reset service counters, initiate a drain cycle, reset warning alarms, fill the evaporation chamber, calibrate the water level sensor or perform an air purge. | Present_Value<br>Out_of_Service | 1 = None<br>2 = Reset Alarms<br>3 = Drain<br>4 = Reset Counters<br>5 = Filling<br>6 = WaterCalib<br>7 = PurgeAir                                                                                                                                                                                                                       |

| ID      | Name                       | List       | Description                                                                                                                                                                                                                                                                                                                 | W?                              | Notes                                                                                                                                                                                                                                                                                                                                  |
|---------|----------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MSV.74  | Module 4 Alarm             | Integrator | Displays the current status of the fourth humidifier's alarm.                                                                                                                                                                                                                                                               | Out_of_Service                  | 1 = Normal<br>2 = FailedPump<br>3 = FillTimeout<br>4 = Blocked Piping<br>5 = HeatTimeout<br>6 = Overheat<br>7 = WaterLeak<br>8 = Service<br>9 = Foaming<br>10 = BurnerLocked<br>11 = FanDefect<br>12 = FailedComm<br>13 = ChimTempHi<br>14 = RefillTimeout<br>15 = FanBlocked<br>16 = SystBick<br>17 = TankBlocked<br>18 = RefillDelay |
| MSV.77  | Boiler Fill Mode           | Integrator | Configuration value to select the water filling method for the fill valve:<br>When set to OneShot, water will continuously flow.<br>When set to Pulsed, water will flow in short bursts.                                                                                                                                    | Present_Value<br>Out_of_Service | 1 = OneShot<br>2 = Pulsed                                                                                                                                                                                                                                                                                                              |
| MSV.79  | Boiler Idle Tank Rinse Off | Integrator | Configuration value to define whether to enable automatic rinse cycles while the humidifier is turned off and remains inactive. To select the amount of time the humidifier remains inactive before a rinse cycle is performed, configure the value of the <i>Boiler Idle Tank Rinse Interval</i> setting.                  | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                                                                                                                                                                                                      |
| MSV.80  | Boiler Idle Tank Rinse On  | Integrator | Configuration value to define whether to enable automatic rinse cycles while the humidifier is turned on and remains in "Idle" or stand-by mode. To select the amount of time the humidifier remains inactive before a rinse cycle is performed, configure the value of the <i>Boiler Idle Tank Rinse Interval</i> setting. | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                                                                                                                                                                                                      |
| MSV.93  | Water Probe 1 Auto Calib   | Integrator | Configuration value to select whether to enable or disable the automatic calibration of the water level sensor of the first humidifier module.                                                                                                                                                                              | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                                                                                                                                                                                                      |
| MSV.94  | Water Probe 2 Auto Calib   | Integrator | Configuration value to select whether to enable or disable the automatic calibration of the water level sensor of the second humidifier module.                                                                                                                                                                             | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                                                                                                                                                                                                      |
| MSV.95  | Water Probe 3 Auto Calib   | Integrator | Configuration value to select whether to enable or disable the automatic calibration of the water level sensor of the third humidifier module.                                                                                                                                                                              | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                                                                                                                                                                                                      |
| MSV.96  | Water Probe 4 Auto Calib   | Integrator | Configuration value to select whether to enable or disable the automatic calibration of the water level sensor of the fourth humidifier module.                                                                                                                                                                             | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                                                                                                                                                                                                                                                                                                      |
| MSV.99  | System Mode                | Integrator | Configuration value to set under which system operation mode the different modules will operate.                                                                                                                                                                                                                            | Present_Value<br>Out_of_Service | 1 = Parallel<br>2 = Sequential<br>3 = Hybrid                                                                                                                                                                                                                                                                                           |
| MSV.104 | BACnet Server Language     | Integrator | Value of the BACnet server language.                                                                                                                                                                                                                                                                                        | Present_Value<br>Out_of_Service | 1 = English<br>2 = French<br>3 = Spanish                                                                                                                                                                                                                                                                                               |

| ID      | Name                               | List       | Description                                                                                                                                                                                                                          | W?                              | Notes                                                   |
|---------|------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------|
| MSV.115 | Boiler Startup Tank Rinse          | Integrator | Configuration value to define whether to perform an automatic rinse cycle upon each start-up of the humidifier.                                                                                                                      | Present_Value<br>Out_of_Service | 1 = Off<br>2 = On                                       |
| MSV.116 | Module 1 Water Level Probe Warning | Integrator | Displays whether there is currently a warning message associated with the water level sensor for the first humidifier module, in order to indicate that there is a calibration error or a drifting error with the capacitive probe.  | Read Only                       | 1 = Ok<br>2 = Calib<br>3 = Replace                      |
| MSV.117 | Module 2 Water Level Probe Warning | Integrator | Displays whether there is currently a warning message associated with the water level sensor for the second humidifier module, in order to indicate that there is a calibration error or a drifting error with the capacitive probe. | Read Only                       | 1 = Ok<br>2 = Calib<br>3 = Replace                      |
| MSV.118 | Module 3 Water Level Probe Warning | Integrator | Displays whether there is currently a warning message associated with the water level sensor for the third humidifier module, in order to indicate that there is a calibration error or a drifting error with the capacitive probe.  | Read Only                       | 1 = Ok<br>2 = Calib<br>3 = Replace                      |
| MSV.119 | Module 4 Water Level Probe Warning | Integrator | Displays whether there is currently a warning message associated with the water level sensor for the fourth humidifier module, in order to indicate that there is a calibration error or a drifting error with the capacitive probe. | Read Only                       | 1 = Ok<br>2 = Calib<br>3 = Replace                      |
| MSV.121 | Water Level 1 Probe Failure        | Integrator | Displays which one of the water level sensor's probes is currently not functioning properly for the first humidifier module.                                                                                                         | Read Only                       | 1 = None<br>2 = Capacitive<br>3 = Resistive<br>4 = Both |
| MSV.122 | Water Level 2 Probe Failure        | Integrator | Displays which one of the water level sensor's probes is currently not functioning properly for the second humidifier module.                                                                                                        | Read Only                       | 1 = None<br>2 = Capacitive<br>3 = Resistive<br>4 = Both |
| MSV.123 | Water Level 3 Probe Failure        | Integrator | Displays which one of the water level sensor's probes is currently not functioning properly for the third humidifier module.                                                                                                         | Read Only                       | 1 = None<br>2 = Capacitive<br>3 = Resistive<br>4 = Both |
| MSV.124 | Water Level 4 Probe Failure        | Integrator | Displays which one of the water level sensor's probes is currently not functioning properly for the fourth humidifier module.                                                                                                        | Read Only                       | 1 = None<br>2 = Capacitive<br>3 = Resistive<br>4 = Both |
| MSV.125 | Module 1 Bacnet Units              | Integrator | Displays the BACnet units for module 1.                                                                                                                                                                                              | Read Only                       | 0 = Metric<br>1 = Imperial                              |
| MSV.126 | Module 2 Bacnet Units              | Integrator | Displays the BACnet units for module 2.                                                                                                                                                                                              | Read Only                       | 0 = Metric<br>1 = Imperial                              |
| NSV.127 | Module 3 Bacnet Units              | Integrator | Displays the BACnet units for module 3.                                                                                                                                                                                              | Read Only                       | 0 = Metric<br>1 = Imperial                              |
| MSV.128 | Module 4 Bacnet Units              | Integrator | Displays the BACnet units for module 4.                                                                                                                                                                                              | Read Only                       | 0 = Metric<br>1 = Imperial                              |
| MSV.129 | Module 1 Water Level Probe Alarm   | Integrator | Displays whether there is currently an alarm message to indicate that the water level sensor is defective and must be replaced or must be calibrated for the first humidifier module.                                                | Read Only                       | 0 = Ok<br>1 = Defect<br>2 = NoCalib                     |

| ID      | Name                             | List       | Description                                                                                                                                                                            | W?        | Notes                               |
|---------|----------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------|
| MSV.130 | Module 2 Water Level Probe Alarm | Integrator | Displays whether there is currently an alarm message to indicate that the water level sensor is defective and must be replaced or must be calibrated for the second humidifier module. | Read Only | 0 = Ok<br>1 = Defect<br>2 = NoCalib |
| MSV.131 | Module 3 Water Level Probe Alarm | Integrator | Displays whether there is currently an alarm message to indicate that the water level sensor is defective and must be replaced or must be calibrated for the third humidifier module.  | Read Only | 0 = Ok<br>1 = Defect<br>2 = NoCalib |
| MSV.132 | Module 4 Water Level Probe Alarm | Integrator | Displays whether there is currently an alarm message to indicate that the water level sensor is defective and must be replaced or must be calibrated for the fourth humidifier module. | Read Only | 0 = Ok<br>1 = Defect<br>2 = NoCalib |

## Other

**Table 10 - Object Table Information: Other**

| ID     | Name                                 | List       | Description                           | W?                               | Notes                                                        |
|--------|--------------------------------------|------------|---------------------------------------|----------------------------------|--------------------------------------------------------------|
| PGM.1  | NSDF Core Program                    | Advanced   | NSDF Core Program.                    | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.2  | BACnet Server Program                | Advanced   | BACnet Server Program.                | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.3  | LCD_Display Program                  | Advanced   | LCD_Display Program.                  | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.4  | Modbus Server Program                | Advanced   | Modbus Server Program.                | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.5  | RMHI Program                         | Advanced   | RHMI Program.                         | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.6  | SKG Program                          | Advanced   | SKG Program.                          | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.7  | Universal Humidifier Manager Program | Advanced   | Universal Humidifier Manager Program. | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.8  | Universal User Control Program       | Advanced   | Universal User Control Program.       | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.9  | Web Server Program                   | Advanced   | Web Server Program.                   | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.10 | Water Level Probe Program            | Advanced   | Water Level Probe Program.            | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| PGM.15 | Database Program                     | Advanced   | Database Program.                     | Program_Change<br>Out_of_Service | Program Change, only LOAD (1) and RESTART (4) are supported. |
| FIL.2  | UpdatePackageFile                    | Advanced   | Update Package file.                  | File_Size                        | File size is accepted for 0 value only                       |
| FIL.4  | SysLogAlarm                          | Integrator | System Log Alarm.                     | File_Size                        | File size is accepted for 0 value only                       |

| ID     | Name                      | List       | Description                                                                                                                                                                | W?                                                                                                                                          | Notes                                  |
|--------|---------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| FIL.9  | USB System Log File       | Integrator | USB System Log file.                                                                                                                                                       | File_Size                                                                                                                                   | File size is accepted for 0 value only |
| FIL.10 | USB System Alarm Log File | Integrator | USB System Alarm Log file.                                                                                                                                                 | File_Size                                                                                                                                   | File size is accepted for 0 value only |
| FIL.16 | System Log File           | Integrator | System Log file.                                                                                                                                                           | File_Size                                                                                                                                   | File size is accepted for 0 value only |
| SCH.1  | Occupancy Schedule        | Integrator | Weekly occupancy schedule to specify which occupancy state is active during specific periods of day. Create a customized occupancy schedule with up to six events per day. | Effective_Period<br>Schedule_Default<br>List_of_Object_Property_<br>References<br>Priority_for_Writing<br>Out_of_Service<br>Weekly_Schedule | Monday to Sunday, Event 1 to Event 6   |
| SCH.2  | Drain Schedule            | Integrator | Customized draining schedule with up to six events per day.                                                                                                                | Effective_Period<br>Schedule_Default<br>List_of_Object_Property_<br>References<br>Priority_for_Writing<br>Out_of_Service<br>Weekly_Schedule | Monday to Sunday, Event 1 to Event 6   |

[illegible]



**neptronic®**

400 Lebeau blvd, Montreal, Qc, H4N 1R6, Canada

[www.neptronic.com](http://www.neptronic.com)

Toll free in North America: 1-800-361-2308

Tel.: (514) 333-1433

Fax: (514) 333-3163

Customer service fax: (514) 333-1091

Monday to Friday: 8:00am to 5:00pm (Eastern time)