

# Direct Digital Controls (DDC)

APPLICATION GUIDE

## DDC Application Guide for Paragon HVAC Series

### Introduction

This guide will provide a brief overview of how to control and monitor key aspects of a Paragon HVAC Unit when using a third party Building Management System (BMS). It will cover controlling the unit using occupancy, controlling the blower speed, heating, cooling, dehumidification setpoints, controlling the outdoor air damper, and monitoring heating and cooling capacity usage. Also, information on which factory settings and control points are important for each unit feature and what control point values correspond to different modes of operation will be covered.

### Using Schedule to Allow BMS Control

**Point 5** allows a BMS to control the unit easily via controlling occupancy. For this method to work correctly, Scheduling must be enabled (**Point 216**). The schedule only needs to be enabled once. It does not need to be regularly switched on/off. The internal schedule must also be set to unoccupied at all hours (**Points 46-87** must be set to 1440). An input of occupancy will always override one of an unoccupied input, so setting the internal schedule to unoccupied allows the BMS full control over when the unit is in an occupied mode via **Point 5**. If any of the internal schedule points are set to something other than 1440, using **Point 5** to turn occupancy on and off in those times will not work and the schedule must be adjusted on-site. To manually set the schedule time slots to unoccupied while on-site, follow the **Scheduling** instructions.

### Scheduling

To set a schedule on the HMI (**Figure 1**), you must first enable scheduling: **Factory Settings > Occupied Scheduling > On**

Set your sensor temperature set points for occupied and unoccupied schedules: **User Settings > Temp Set Points > (Varies)**

Once scheduling is enabled, and the temperature set points are configured, you may enter your scheduled days and times: **User Settings > Scheduling**

#### Schedule A Default

- Monday - Friday  
8:00AM to 6:00PM
- Saturday and Sunday  
Unocc

#### Schedule B Default

- Monday - Friday  
Unocc
- Saturday and Sunday  
Unocc

#### Schedule C Default

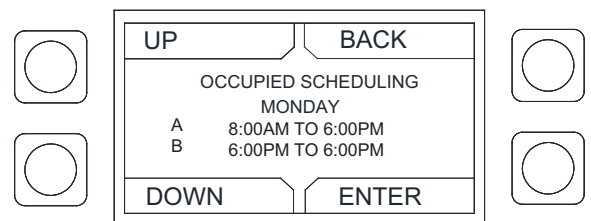
- Monday - Friday  
Unocc
- Saturday and Sunday  
Unocc

To adjust the settings, highlight the parameter and press **ENTER**.

- The first parameter to be highlighted will be the day. Press **UP** or **DOWN** to select the day an occupied time schedule is required.
- Press **ENTER** to continue to set a start time. Press **UP** or **DOWN** to set start time.
- Press **ENTER** to set an end time. Press **UP** or **DOWN** to set end time.

The system will run between these days, time, and desired temperature settings. When in the UNOCCUPIED setting, the system will run at the unoccupied temperature setting.

Figure 1 - Scheduling Screen



**PLEASE REFER TO THE PRODUCT OPERATION, INSTALLATION, AND MAINTENANCE MANUAL FOR COMPLETE DETAILS ON UNIT OPERATION.**

## Controlling Blower Speed

**Points 223** and **224** allow you to determine how the blower is controlled in each occupancy mode. The values that correspond to each mode are as follows:

**Off = 0, Auto = 1, On = 2**

In blower off mode, the blower will run only when the unit interlock pin is powered. If set to Auto, the blower will only run when there is a call for heating or cooling. If set to On, as long as the fan button is enabled, the blower will run regardless of whether the building needs heating or cooling.

**Points 88-91** allow you to set the speed of the blower, with separate points for VFD and ECM motors and occupied and unoccupied hours.

The speed of the motor set by **Points 88-91** above must be within the max and minimum speed setpoints found in **Points 228-235**. Once again, there are a separate set of points for VFDs and ECM motors and occupied and unoccupied hours.

## Heating/Cooling/Dehumidification Setpoints

Units can activate based on intake and/or space temperature. This is controlled with the “Activate Based On” setting found in **Points 221-222**. The values that correspond to each mode are as follows:

**0 = Intake, 1 = Space, 2 = Both, 3 = Either, 4 = Stat**

For intake-based activation **Points 6-7** and **16-17** determine the intake setpoints for heating and cooling for occupied and unoccupied hours. These points are not used if Activate Based On is set to Space. Heating Type must also be set to a heating configuration for the heating points to be relevant.

Likewise, **Points 8-9** and **18-19** determine the space setpoints for heating and cooling for unoccupied and occupied hours. These points are not used if Activate Based On is set to Intake. Again, Heating Type must also be set to a heating configuration for the heating points to be relevant.

When active, units can target either a discharge temperature or space temperature. This is controlled by the Tempering Mode setting (**Points 217-220**). The values that correspond to each mode are as follows:

**0 = Discharge, 1 = Space, 2 = BAS, 3 = DDC**

If Tempering Mode is set to Space, **Points 10-11** and **14-15** control the minimum and maximum discharge temperature in heating for occupied and unoccupied times. The unit then has the ability to vary the temperature within this range to meet the space setpoint. **Points 20-21** and **24-25** do the same for discharge cooling.

If tempering mode is set to discharge, **Points 12-13** and **22-23** control the heating and cooling discharge setpoints for occupied and unoccupied hours.

Units with reheat have the ability to precisely control humidity in addition to temperature. Reheat will activate based on the same “Activate Based On” setting used to control heating and cooling. Just as with temperature, when active, units can target either a discharge humidity or space humidity, which is controlled by the Tempering mode discussed above (**Points 217-220**).

Humidity can be controlled via Relative Humidity or Dewpoint setpoints as selected by the Reheat Mode. **Points 34-39** control the intake, space, and discharge RH setpoints for occupied and unoccupied hours and **Points 40-45** control the same for dewpoint. Which set of these points to use is determined by whether RH or DP is selected as your Reheat Mode. To change one’s Reheat Mode one must go to **Factory Settings > Cooling Config > Reheat Config > Reheat Mode** and select the appropriate mode.

The Intake SPs serve as activation setpoints if Activate Based On is set to Intake. The Discharge SPs serve as target setpoints if Tempering Mode is set to Discharge. The Space SP can function as activation setpoints if Activate Based On is set to Space or Either and/or target setpoints if Tempering Mode is set to Space.

## Outdoor Air Damper Control

**Point 225** determines the mixing box mode, with the following possible modes:

**0 = Off, 1 = Manual, 2 = Position, 3 = OAPercent, 4 = AnalogCtrl, 5 = PS, 6 = 100% OA**

If the mixing box mode is set to outdoor air percentage, **Points 92-93** are used to set the outdoor air percentage for occupied and unoccupied times and **Points 236-239** are used to set the minimum and maximum allowable outdoor air percentages that **Points 92-93** must remain within the set value.

If the mixing box mode is set to manual, **Points 102-103** are used to set the mixing box damper voltage for occupied and unoccupied times and **Points 240-243** are used to set the minimum and maximum allowable voltages that **Points 102-103** must remain within the set value.

## Monitoring of Heating and Cooling Capacity Usage

**Point 139** determines unit status:

**Idle = 0, Blower = 1, Heating = 2, Cooling = 3**

**Points 178-179** show how open the gas heat valve(s) are on gas heat units. Note that the gas valve is also fully open when the unit isn't heating, so a reading of 10V can mean the unit is either in High Fire or not in heating mode. **Point 181** shows the heating usage for electric heat units.

## Network

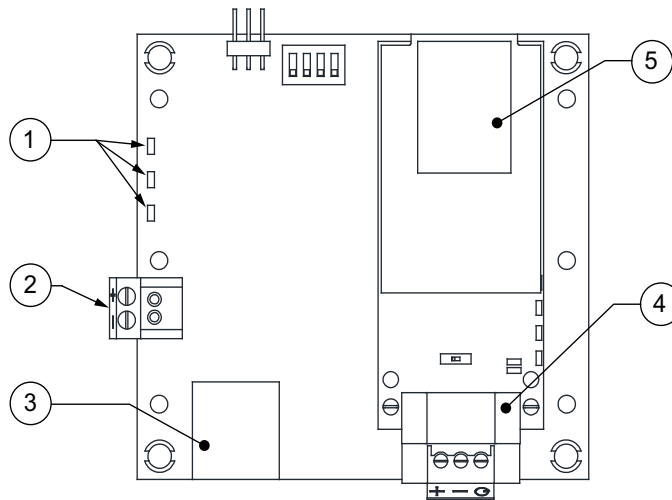
**NOTE: The board will reboot when altering certain factory settings.**

### BACnet

BACnet IP or BACnet MS/TP (**Figure 2**) compatibility can be implemented with this package through a Processor, which is a BTL listed embedded Gateway configured to give a Building Management System access to monitor and/or control a list of BACnet objects. The Processor is mounted and factory pre-wired inside the Electrical Control Panel (ECP). Field connections to the Building Management System (BMS) are shown on wiring schematics.

The Processor is preconfigured at the factory to use the field protocol of the Building Management System in the specific jobsite. BACnet objects can only be accessed through the specified port and protocol.

**Figure 2 - BACnet**



1. Status LEDs
  - Green - Data Out
  - Yellow - Data In
  - Red - Power On
2. Power Supply 24V AC/DC
3. Cat 5 Cable to MUA Board.
4. Field RS485 Connection for BACnet MS/TP
5. Field Ethernet Connection for BACnet IP

## Device Instance, MAC Address, Baud Rate

Some applications may require that the Protoceptor have a specific Device Instance, the default device instance is 50,000. To change the Device Instance, you must access the Web Configurator by connecting a computer to the Ethernet port of the Protoceptor. The computer used must be assigned a static IP address of 192.168.1.xxx and a subnet mask of 255.255.255.0.

To access the Web Configurator, type the IP address of the Protoceptor in the URL of any web browser. The default IP address of the Protoceptor is 192.168.1.24. Once the landing page has loaded, if required, log in using “admin” for the username and password. If the default “admin” password does not work, the gateway should have a printed password on the module’s Ethernet port.

Go to the main configuration page, select “Configure” from the left-hand menu. Select “Profile Configuration,” the following window shown in **Figure 3** should appear.

The MAC address and Baud Rate, used by BACnet MTSP, are editable. The MAC address default is 127, and the Baud Rate default is 38400.

If any changes are made, **click on the submit button for each individual change**. Each individual change will require the system to restart.

**Figure 3 - Configuration Parameters Page**

| Configuration Parameters |  |  |
|--------------------------|--|--|
| Parameter Name           | Parameter Description  | Value  |
| bac_device_id            | <b>BACnet Device Instance</b><br>This sets the BACnet device instance.<br>(1 - 4194303)          | <input type="text" value="50177"/> <input type="button" value="Submit"/> |
| bac_mac_addr             | <b>BACnet MSTP Mac Address</b><br>This sets the BACnet MSTP MAC address.<br>(1 - 127)            | <input type="text" value="7"/> <input type="button" value="Submit"/>     |
| bac_baud_rate            | <b>BACnet MSTP Baud Rate</b><br>This sets the BACnet MSTP baud rate.<br>(9600/19200/38400/76800) | <input type="text" value="76800"/> <input type="button" value="Submit"/> |
| bac_max_master           | <b>BACnet MSTP Max Master</b><br>This sets the BACnet MSTP max master.<br>(1 - 127)              | <input type="text" value="127"/> <input type="button" value="Submit"/>   |

## Changing the IP Address

Some BACnet IP applications may require changing the IP address of the Protoceessor. To change the IP address, go to the internal server by typing the default IP address of the Protoceessor, 192.168.1.24, in the URL field of any web browser. The computer used must have a static IP address of 192.168.1.xxx. The window shown in **Figure 4** appears. Click on the “Diagnostics and Debugging” button in the lower right corner.

Click on “Setup” from the left-hand side menu and select “Network Settings.” The window shown in **Figure 4** will appear. You can now modify the IP address to whatever is required in the application. Once the IP address has been modified, click on “Update IP Settings.”

**Figure 4 - Network Settings Page**

The screenshot displays the SMC (Sierra Monitor) Network Settings page. The interface includes a navigation menu on the left, a main content area for network settings, and a footer with utility buttons.

**Navigation Menu:**

- Navigation
  - CN0861 CaptiveAire v1.00a
    - About
    - Setup
      - File Transfer
      - Network Settings**
      - Passwords
    - View
    - User Messages

**Network Settings Page:**

**IP Settings**

**Note:** Updated settings only take effect after a System Restart. If the IP Address is changed you will need to direct your browser to the new IP Address after the System Restart.

|                      |  |
|----------------------|--|
| N1 IP Address        | <input type="text" value="192.168.1.24"/>  |
| N1 Netmask           | <input type="text" value="255.255.255.0"/> |
| N1 DHCP Client State | <input type="checkbox" value="DISABLED"/>  |
| N1 DHCP Server State | <input type="checkbox" value="DISABLED"/>  |
| Default Gateway      | <input type="text" value="192.168.1.1"/>   |
| Domain Name Server1  | <input type="text" value="0.0.0.0"/>       |
| Domain Name Server2  | <input type="text" value="0.0.0.0"/>       |

**MAC Address**

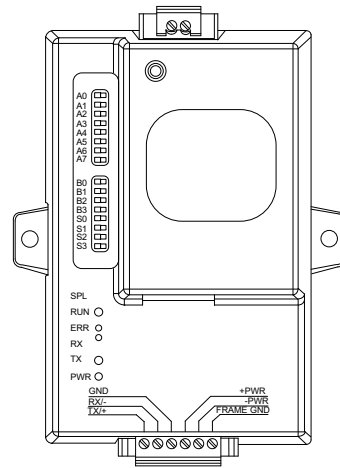
N1 MAC Address: 00:50:4E:10:07:27

**Footer:** Home | Help (F1) | Contact Us |

## LonWorks

LonWorks compatibility (**Figure 5**) can be implemented on control packages through the ProtoNode, a LonMark certified external Gateway configured to give a Building Management System access to monitor and/or control a list of Network Variables. The ProtoNode is mounted and factory pre-wired inside the Electrical Control Panel. Refer to schematics connections to the Building Management System are shown.

**Figure 5 - LonWorks**



## Commissioning on a LonWorks Network

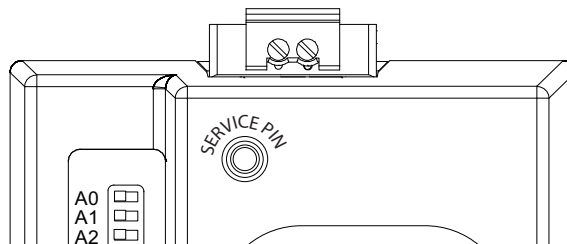
During the commissioning process by the LonWorks administrator (using a LonWorks Network Management Tool), the user will be prompted to hit the Service Pin in the ProtoNode. This pin is located in the front face, and it can be pressed by inserting a small screwdriver and tilting it towards the LonWorks Port. Refer to **Figure 6** for location of the “Service Pin.”

If an XIF file is required, it can be obtained by following these steps:

1. Set your computer's static IP address to 192.168.1.xxx with a subnet mask of 255.255.255.0.
2. Run a Cat 5 connection from the ProtoNode's Ethernet port to your computer.
3. On any web browser's URL field, type 192.168.1.24/fserver.xif.

The web browser should automatically download the fserver.xif file or let you save it on your computer. Save it as fserver.xif.

**Figure 6 - LonWorks Service Pin**



**NOTE: Insert Small Screwdriver.  
Tilt Toward LonWorks Port To  
Activate Service Pin.**

# DDC Control Points (BACnet)

Refer to DDC Notes for more information.

| Name                        | ID | Object Type       | Lon SNVT Name                         | Function        | Modbus         | Description  |
|-----------------------------|----|-------------------|---------------------------------------|-----------------|----------------|--|
| DDCHeatCommand (1)          | 1  | Binary Value (BV) | nviDDCHeat/nvoDDCHeat                 | Control/Monitor | 10000, Holding | Heating command. Requires heat tempering mode = DDC  |
| DDCCoolCommand (1)          | 2  | BV                | nviDDCCool1/nvoDDCCool                | Control/Monitor | 10001, Holding | Cooling command. Requires heat tempering mode = DDC  |
| DDCBlowerCommand (1)        | 3  | BV                | nviDDCBlow/nvoDDCBlow                 | Control/Monitor | 10004, Holding | Blower command. Requires both heat and cool tempering mode = DDC                                     |
| DDCModulation (1)           | 4  | Analog Value (AV) | nviDDCModHeat/nvoDDCModHeat           | Control/Monitor | 10005, Holding | Heat modulation signal, 0-10V. 0V = low fire and 10V = high fire. Requires heat tempering mode = DDC |
| DDCOccupiedOverride (4)     | 5  | BV                | nviDDCOccOvrnd/nvoDDCOccOvrnd         | Control/Monitor | 10006, Holding | Occupied override command, requires SchedulingEnabled = ON (1)                                       |
| IntakeHeatOccSP (3)         | 6  | AV                | nviInHeatOccSP/nvoInHeatOccSP         | Control/Monitor | 16000, Holding | Intake Heating Occupied Setpoint   |
| IntakeHeatUnoccSP (3)       | 7  | AV                | nviInHeatUnoccSP/nvoInHeatUnoccSP     | Control/Monitor | 16001, Holding | Intake Heating Unoccupied Setpoint   |
| SpaceHeatOccSP (3)          | 8  | AV                | nviSpHeatOccSP/nvoSpHeatOccSP         | Control/Monitor | 16002, Holding | Space Heating Occupied Setpoint  |
| SpaceHeatUnoccSP (3)        | 9  | AV                | nviSpHeatUnoccSP/nvoSpHeatUnoccSP     | Control/Monitor | 16003, Holding | Space Heating Unoccupied Setpoint  |
| MinDischargeHeatOccSP (3)   | 10 | AV                | nviMinDHeatOccSP/nvoMinDHeatOccSP     | Control/Monitor | 16004, Holding | Min Discharge Heating when occupied, relevant only if heat tempering mode = space                    |
| MinDischargeHeatUnoccSP (3) | 11 | AV                | nviMinDHeatUnoccSP/nvoMinDHeatUnoccSP | Control/Monitor | 16005, Holding | Min Discharge Heating when unoccupied, relevant only if heat tempering mode = space                  |
| DischargeHeatOccSP (3)      | 12 | AV                | nviDisHeatOccSP/nvoDisHeatOccSP       | Control/Monitor | 16006, Holding | Discharge heating setpoint when occupied, requires heat tempering mode = discharge                   |
| DischargeHeatUnoccSP (3)    | 13 | AV                | nviDisHeatUnoccSP/nvoDisHeatUnoccSP   | Control/Monitor | 16007, Holding | Discharge heating setpoint when unoccupied, requires heat tempering mode = discharge                 |
| MaxDischargeHeatOccSP (3)   | 14 | AV                | nviMaxDHeatOccSP/nvoMaxDHeatOccSP     | Control/Monitor | 16008, Holding | Max Discharge Heating when occupied, relevant only if heat tempering mode = space                    |
| MaxDischargeHeatUnoccSP (3) | 15 | AV                | nviMaxDHeatUnoccSP/nvoMaxDHeatUnoccSP | Control/Monitor | 16009, Holding | Max Discharge Heating when unoccupied, relevant only if heat tempering mode = space                  |
| IntakeCoolOccSP (3)         | 16 | AV                | nviInCoolOccSP/nvoInCoolOccSP         | Control/Monitor | 16010, Holding | Intake Cooling Occupied Setpoint   |
| IntakeCoolUnoccSP (3)       | 17 | AV                | nviInCoolUnoccSP/nvoInCoolUnoccSP     | Control/Monitor | 16011, Holding | Intake Cooling Unoccupied Setpoint   |
| SpaceCoolOccSP (3)          | 18 | AV                | nviSpCoolOccSP/nvoSpCoolOccSP         | Control/Monitor | 16012, Holding | Space Cooling Occupied Setpoint  |
| SpaceCoolUnoccSP (3)        | 19 | AV                | nviSpCoolUnoccSP/nvoSpCoolUnoccSP     | Control/Monitor | 16013, Holding | Space Cooling Unoccupied Setpoint  |
| MinDischargeCoolOccSP (3)   | 20 | AV                | nviMinDCoolOccSP/nvoMinDCoolOccSP     | Control/Monitor | 16014, Holding | Min Discharge Cooling setpoint when occupied, relevant only if cool tempering mode = space           |
| MinDischargeCoolUnoccSP (3) | 21 | AV                | nviMinDCoolUnoccSP/nvoMinDCoolUnoccSP | Control/Monitor | 16015, Holding | Min Discharge Cooling setpoint when unoccupied, relevant only if cool tempering mode = space         |
| DischargeCoolOccSP (3)      | 22 | AV                | nviDisCoolOccSP/nvoDisCoolOccSP       | Control/Monitor | 16016, Holding | Discharge Cooling setpoint when occupied, relevant only if cool tempering mode = discharge           |
| DischargeCoolUnoccSP (3)    | 23 | AV                | nviDisCoolUnoccSP/nvoDisCoolUnoccSP   | Control/Monitor | 16017, Holding | Discharge Cooling setpoint when unoccupied, relevant only if cool tempering mode = discharge         |
| MaxDischargeCoolOccSP (3)   | 24 | AV                | nviMaxDCoolOccSP/nvoMaxDCoolOccSP     | Control/Monitor | 16018, Holding | Max Discharge Cooling setpoint when occupied, relevant only if cool tempering mode = space           |
| MaxDischargeCoolUnoccSP (3) | 25 | AV                | nviMaxDCoolUnoccSP/nvoMaxDCoolUnoccSP | Control/Monitor | 16019, Holding | Max Discharge Cooling setpoint when unoccupied, relevant only if cool tempering mode = space         |
| RoomOverrideOccSP (3)       | 26 | AV                | nviRoomOvOccSP/nvoRoomOvOccSP         | Control/Monitor | 16020, Holding | Room Override Occupied Setpoint  |
| RoomOverrideUnoccSP (3)     | 27 | AV                | nviRoomOvUnoccSP/nvoRoomOvUnoccSP     | Control/Monitor | 16021, Holding | Room Override Unoccupied Setpoint  |
| FirestatIntakeSP (3)        | 28 | AV                | nviFireIntakeSP/nvoFireIntakeSP       | Control/Monitor | 16022, Holding | Firestat Intake Setpoint   |
| FirestatDischargeSP (3)     | 29 | AV                | nviFireDischSP/nvoFireDischSP         | Control/Monitor | 16023, Holding | Firestat Discharge Setpoint  |
| FreezeStatSP (3)            | 30 | AV                | nviFreezeSP/nvoFreezeSP               | Control/Monitor | 16024, Holding | FreezeStat Setpoint  |
| OverheatDischargeSP (3)     | 31 | AV                | nviOheatDisSP/nvoOheatDisSP           | Control/Monitor | 16025, Holding | Overheat Discharge Setpoint  |
| CabinetHeatSP (3)           | 32 | AV                | nviCabHeatSP/nvoCabHeatSP             | Control/Monitor | 16026, Holding | Cabinet Heat Setpoint  |
| FurnaceDrainHeatSP (3)      | 33 | AV                | nviFDrainHeatSP/nvoFDrainHeatSP       | Control/Monitor | 16027, Holding | Furnace Drain Heat Setpoint  |
| IntakeRhOccSP (3)           | 34 | AV                | nviInRhOccSP/nvoInRhOccSP             | Control/Monitor | 16028, Holding | Intake Relative Humidity Occupied Setpoint   |
| IntakeRhUnoccSP (3)         | 35 | AV                | nviInRhUnoccSP/nvoInRhUnoccSP         | Control/Monitor | 16029, Holding | Intake Relative Humidity Unoccupied Setpoint   |
| SpaceRhOccSP (3)            | 36 | AV                | nviSpRhOccSP/nvoSpRhOccSP             | Control/Monitor | 16030, Holding | Space Relative Humidity Occupied Setpoint  |
| SpaceRhUnoccSP (3)          | 37 | AV                | nviSpRhUnoccSP/nvoSpRhUnoccSP         | Control/Monitor | 16031, Holding | Space Relative Humidity Unoccupied Setpoint  |
| DischargeRhOccSP (3)        | 38 | AV                | nviDisRhOccSP/nvoDisRhOccSP           | Control/Monitor | 16032, Holding | Discharge Relative Humidity Occupied Setpoint  |
| DischargeRhUnoccSP (3)      | 39 | AV                | nviDisRhUnoccSP/nvoDisRhUnoccSP       | Control/Monitor | 16033, Holding | Discharge Relative Humidity Unoccupied Setpoint  |
| IntakeDpOccSP (3)           | 40 | AV                | nviInDpOccSP/nvoInDpOccSP             | Control/Monitor | 16034, Holding | Intake Dewpoint Occupied Setpoint  |
| IntakeDpUnoccSP (3)         | 41 | AV                | nviInDpUnoccSP/nvoInDpUnoccSP         | Control/Monitor | 16035, Holding | Intake Dewpoint Unoccupied Setpoint  |
| SpaceDpOccSP (3)            | 42 | AV                | nviSpDpOccSP/nvoSpDpOccSP             | Control/Monitor | 16036, Holding | Space Dewpoint Occupied Setpoint   |
| SpaceDpUnoccSP (3)          | 43 | AV                | nviSpDpUnoccSP/nvoSpDpUnoccSP         | Control/Monitor | 16037, Holding | Space Dewpoint Unoccupied Setpoint   |
| DischargeDpOccSP (3)        | 44 | AV                | nviDisDpOccSP/nvoDisDpOccSP           | Control/Monitor | 16038, Holding | Discharge Dewpoint Occupied Setpoint   |
| DischargeDpUnoccSP (3)      | 45 | AV                | nviDisDpUnoccSP/nvoDisDpUnoccSP       | Control/Monitor | 16039, Holding | Discharge Dewpoint Unoccupied Setpoint   |
| ScheduleSundayAStart (4)    | 46 | AV                | nviSundayAStart/nvoSundayAStart       | Control/Monitor | 16040, Holding | Daily schedule start/end time in minutes   |
| ScheduleSundayAEnd (4)      | 47 | AV                | nviSundayAEnd/nvoSundayAEnd           | Control/Monitor | 16041, Holding | Daily schedule start/end time in minutes   |
| ScheduleSundayBStart (4)    | 48 | AV                | nviSundayBStart/nvoSundayBStart       | Control/Monitor | 16042, Holding | Daily schedule start/end time in minutes   |
| ScheduleSundayBEnd (4)      | 49 | AV                | nviSundayBEnd/nvoSundayBEnd           | Control/Monitor | 16043, Holding | Daily schedule start/end time in minutes   |
| ScheduleSundayCStart (4)    | 50 | AV                | nviSundayCStart/nvoSundayCStart       | Control/Monitor | 16044, Holding | Daily schedule start/end time in minutes   |
| ScheduleSundayCEnd (4)      | 51 | AV                | nviSundayCEnd/nvoSundayCEnd           | Control/Monitor | 16045, Holding | Daily schedule start/end time in minutes   |
| ScheduleMondayAStart (4)    | 52 | AV                | nviMondayAStart/nvoMondayAStart       | Control/Monitor | 16046, Holding | Daily schedule start/end time in minutes   |
| ScheduleMondayAEnd (4)      | 53 | AV                | nviMondayAEnd/nvoMondayAEnd           | Control/Monitor | 16047, Holding | Daily schedule start/end time in minutes   |
| ScheduleMondayBStart (4)    | 54 | AV                | nviMondayBStart/nvoMondayBStart       | Control/Monitor | 16048, Holding | Daily schedule start/end time in minutes   |
| ScheduleMondayBEnd (4)      | 55 | AV                | nviMondayBEnd/nvoMondayBEnd           | Control/Monitor | 16049, Holding | Daily schedule start/end time in minutes   |
| ScheduleMondayCStart (4)    | 56 | AV                | nviMondayCStart/nvoMondayCStart       | Control/Monitor | 16050, Holding | Daily schedule start/end time in minutes   |
| ScheduleMondayCEnd (4)      | 57 | AV                | nviMondayCEnd/nvoMondayCEnd           | Control/Monitor | 16051, Holding | Daily schedule start/end time in minutes   |
| ScheduleTuesdayAStart (4)   | 58 | AV                | nviTuesdayAStart/nvoTuesdayAStart     | Control/Monitor | 16052, Holding | Daily schedule start/end time in minutes   |
| ScheduleTuesdayAEnd (4)     | 59 | AV                | nviTuesdayAEnd/nvoTuesdayAEnd         | Control/Monitor | 16053, Holding | Daily schedule start/end time in minutes   |
| ScheduleTuesdayBStart (4)   | 60 | AV                | nviTuesdayBStart/nvoTuesdayBStart     | Control/Monitor | 16054, Holding | Daily schedule start/end time in minutes   |
| ScheduleTuesdayBEnd (4)     | 61 | AV                | nviTuesdayBEnd/nvoTuesdayBEnd         | Control/Monitor | 16055, Holding | Daily schedule start/end time in minutes   |
| ScheduleTuesdayCStart (4)   | 62 | AV                | nviTuesdayCStart/nvoTuesdayCStart     | Control/Monitor | 16056, Holding | Daily schedule start/end time in minutes   |
| ScheduleTuesdayCEnd (4)     | 63 | AV                | nviTuesdayCEnd/nvoTuesdayCEnd         | Control/Monitor | 16057, Holding | Daily schedule start/end time in minutes   |



| Name                          | ID  | Object Type | Lon SNVT Name                           | Function        | Modbus         | Description  |
|-------------------------------|-----|-------------|---|-----------------|----------------|--|
| ScheduleWednesdayASStart (4)  | 64  | AV          | nviWedASStart/nvoWedASStart             | Control/Monitor | 16058, Holding | Daily schedule start/end time in minutes   |
| ScheduleWednesdayAEnd (4)     | 65  | AV          | nviWedAEnd/nvoWedAEnd                   | Control/Monitor | 16059, Holding | Daily schedule start/end time in minutes   |
| ScheduleWednesdayBStart (4)   | 66  | AV          | nviWedBStart/nvoWedBStart               | Control/Monitor | 16060, Holding | Daily schedule start/end time in minutes   |
| ScheduleWednesdayBEnd (4)     | 67  | AV          | nviWedBEnd/nvoWedBEnd                   | Control/Monitor | 16061, Holding | Daily schedule start/end time in minutes   |
| ScheduleWednesdayCStart (4)   | 68  | AV          | nviWedCStart/nvoWedCStart               | Control/Monitor | 16062, Holding | Daily schedule start/end time in minutes   |
| ScheduleWednesdayCEnd (4)     | 69  | AV          | nviWedCEnd/nvoWedCEnd                   | Control/Monitor | 16063, Holding | Daily schedule start/end time in minutes   |
| ScheduleThursdayASStart (4)   | 70  | AV          | nviThursASStart/nvoThursASStart         | Control/Monitor | 16064, Holding | Daily schedule start/end time in minutes   |
| ScheduleThursdayAEnd (4)      | 71  | AV          | nviThursAEnd/nvoThursAEnd               | Control/Monitor | 16065, Holding | Daily schedule start/end time in minutes   |
| ScheduleThursdayBStart (4)    | 72  | AV          | nviThursBStart/nvoThursBStart           | Control/Monitor | 16066, Holding | Daily schedule start/end time in minutes   |
| ScheduleThursdayBEnd (4)      | 73  | AV          | nviThursBEnd/nvoThursBEnd               | Control/Monitor | 16067, Holding | Daily schedule start/end time in minutes   |
| ScheduleThursdayCStart (4)    | 74  | AV          | nviThursCStart/nvoThursCStart           | Control/Monitor | 16068, Holding | Daily schedule start/end time in minutes   |
| ScheduleThursdayCEnd (4)      | 75  | AV          | nviThursCEnd/nvoThursCEnd               | Control/Monitor | 16069, Holding | Daily schedule start/end time in minutes   |
| ScheduleFridayASStart (4)     | 76  | AV          | nviFridayASStart/nvoFridayASStart       | Control/Monitor | 16070, Holding | Daily schedule start/end time in minutes   |
| ScheduleFridayAEnd (4)        | 77  | AV          | nviFridayAEnd/nvoFridayAEnd             | Control/Monitor | 16071, Holding | Daily schedule start/end time in minutes   |
| ScheduleFridayBStart (4)      | 78  | AV          | nviFridayBStart/nvoFridayBStart         | Control/Monitor | 16072, Holding | Daily schedule start/end time in minutes   |
| ScheduleFridayBEnd (4)        | 79  | AV          | nviFridayBEnd/nvoFridayBEnd             | Control/Monitor | 16073, Holding | Daily schedule start/end time in minutes   |
| ScheduleFridayCStart (4)      | 80  | AV          | nviFridayCStart/nvoFridayCStart         | Control/Monitor | 16074, Holding | Daily schedule start/end time in minutes   |
| ScheduleFridayCEnd (4)        | 81  | AV          | nviFridayCEnd/nvoFridayCEnd             | Control/Monitor | 16075, Holding | Daily schedule start/end time in minutes   |
| ScheduleSaturdayASStart (4)   | 82  | AV          | nviSatASStart/nvoSatASStart             | Control/Monitor | 16076, Holding | Daily schedule start/end time in minutes   |
| ScheduleSaturdayAEnd (4)      | 83  | AV          | nviSatAEnd/nvoSatAEnd                   | Control/Monitor | 16077, Holding | Daily schedule start/end time in minutes   |
| ScheduleSaturdayBStart (4)    | 84  | AV          | nviSatBStart/nvoSatBStart               | Control/Monitor | 16078, Holding | Daily schedule start/end time in minutes   |
| ScheduleSaturdayBEnd (4)      | 85  | AV          | nviSatBEnd/nvoSatBEnd                   | Control/Monitor | 16079, Holding | Daily schedule start/end time in minutes   |
| ScheduleSaturdayCStart (4)    | 86  | AV          | nviSatCStart/nvoSatCStart               | Control/Monitor | 16080, Holding | Daily schedule start/end time in minutes   |
| ScheduleSaturdayCEnd (4)      | 87  | AV          | nviSatCEnd/nvoSatCEnd                   | Control/Monitor | 16081, Holding | Daily schedule start/end time in minutes   |
| BlowerManualFreqOcc (2)       | 88  | AV          | nviBlowManFreqOcc/nvoBlowManFreqOcc     | Control/Monitor | 16082, Holding | VFD frequency when occupied, requires blower control = VFD manual                                      |
| BlowerManualFreqUnocc (2)     | 89  | AV          | nviBlowManFreqUn/nvoBlowManFreqUn       | Control/Monitor | 16083, Holding | VFD frequency when unoccupied, requires blower control = VFD manual                                    |
| BlowerManualPwmRateOcc (2)    | 90  | AV          | nviBlowManPwmOcc/nvoBlowManPwmOcc       | Control/Monitor | 16084, Holding | ECM speed when occupied, requires blower control = ECM manual  |
| BlowerManualPwmRateUnocc (2)  | 91  | AV          | nviBlowManPwmUn/nvoBlowManPwmUn         | Control/Monitor | 16085, Holding | ECM speed when unoccupied, requires blower control = ECM manual  |
| MixingBoxManualOAOcc (2)      | 92  | AV          | nviMixBoxManOAOcc/nvoMixBoxManOAOcc     | Control/Monitor | 16087, Holding | Mixing Box Outdoor Air Percent during occupied times, requires mixing box mode = outdoor air percent   |
| MixingBoxManualOAUnocc (2)    | 93  | AV          | nviMixBoxManOAUn/nvoMixBoxManOAUn       | Control/Monitor | 16088, Holding | Mixing Box Outdoor Air Percent during unoccupied times, requires mixing box mode = outdoor air percent |
| EconomizerTempSPOcc (2)       | 94  | AV          | nviEcoTempSPOcc/nvoEcoTempSPOcc         | Control/Monitor | 16095, Holding | Economizer Temperature Setpoint Occupied   |
| EconomizerTempSPUnocc (2)     | 95  | AV          | nviEcoTempSPUnocc/nvoEcoTempSPUnocc     | Control/Monitor | 16096, Holding | Economizer Temperature Setpoint Unoccupied   |
| EconomizerTempBandOcc (2)     | 96  | AV          | nviEcoTempBandOcc/nvoEcoTempBandOcc     | Control/Monitor | 16097, Holding | Economizer Temperature Band Setpoint Occupied  |
| EconomizerTempBandUnocc (2)   | 97  | AV          | nviEcoTempBandUnocc/nvoEcoTempBandUnocc | Control/Monitor | 16098, Holding | Economizer Temperature Band Setpoint Unoccupied  |
| EconomizerTotalBandOcc (2)    | 98  | AV          | nviEcoTotBandOcc/nvoEcoTotBandOcc       | Control/Monitor | 16099, Holding | Economizer Temperature Total Band Setpoint Occupied  |
| EconomizerTotalBandUnocc (2)  | 99  | AV          | nviEcoTotBandUnocc/nvoEcoTotBandUnocc   | Control/Monitor | 16100, Holding | Economizer Temperature Total Band Setpoint Unoccupied  |
| EconomizerRhSPOcc (2)         | 100 | AV          | nviEcoRhSPOcc/nvoEcoRhSPOcc             | Control/Monitor | 16101, Holding | Economizer Relative Humidity Setpoint Occupied   |
| EconomizerRhSPUnocc (2)       | 101 | AV          | nviEcoRhSPUnocc/nvoEcoRhSPUnocc         | Control/Monitor | 16102, Holding | Economizer Relative Humidity Setpoint Unoccupied   |
| MixingBoxManualVoltsOcc (2)   | 102 | AV          | nviMixBoxManVOcc/nvoMixBoxManVOcc       | Control/Monitor | 16106, Holding | Mixing Box damper voltage during occupied times, requires mixing box mode = manual                     |
| MixingBoxManualVoltsUnocc (2) | 103 | AV          | nviMixBoxManVUn/nvoMixBoxManVUn         | Control/Monitor | 16107, Holding | Mixing Box damper voltage during unoccupied times, requires mixing box mode = manual                   |
| BlowerPsSplLowOcc (2)         | 104 | AV          | nviBlowPsSplLowOcc/nvoBlowPsSplLowOcc   | Control/Monitor | 16108, Holding | Blower Low Static Pressure Setting Occupied  |
| BlowerPsSplLowUnocc (2)       | 105 | AV          | nviBlowPsSplLowUn/nvoBlowPsSplLowUn     | Control/Monitor | 16109, Holding | Blower Low Static Pressure Setting Unoccupied  |
| BlowerPsSpHighOcc (2)         | 106 | AV          | nviBlowPsSpHighOcc/nvoBlowPsSpHighOcc   | Control/Monitor | 16110, Holding | Blower High Static Pressure Setting Occupied   |
| BlowerPsSpHighUnocc (2)       | 107 | AV          | nviBlowPsSpHighUn/nvoBlowPsSpHighUn     | Control/Monitor | 16111, Holding | Blower High Static Pressure Setting Unoccupied   |
| DryModeDischTempSPOcc (3)     | 108 | AV          | nviDMDisTSPOcc/nvoDMDisTSPOcc           | Control/Monitor | 16112, Holding | Dry Mode Discharge Occupied Setpoint   |
| DryModeDischTempSPUnocc (3)   | 109 | AV          | nviDMDisTSPUn/nvoDMDisTSPUn             | Control/Monitor | 16113, Holding | Dry Mode Discharge Unoccupied Setpoint   |
| OaResetLowTempSp (3)          | 110 | AV          | nviOaRLTempSp/nvoOaRLTempSp             | Control/Monitor | 16114, Holding | Outdoor Air Reset Low Temperature Setpoint   |
| OaResetHighTempSp (3)         | 111 | AV          | nviOaRHTempSp/nvoOaRHTempSp             | Control/Monitor | 16115, Holding | Outdoor Air Reset High Temperature Setpoint  |
| OaResetHeatDischTempSp (3)    | 112 | AV          | nviOaRHeatDTSP/nvoOaRHeatDTSP           | Control/Monitor | 16116, Holding | Outdoor Air Reset Heat Discharge Temperature Setpoint  |
| OaResetCoolDischTempSp (3)    | 113 | AV          | nviOaRCoolDTSP/nvoOaRCoolDTSP           | Control/Monitor | 16136, Holding | Outdoor Air Reset Cool Discharge Temperature Setpoint  |
| OaResetHeatSpaceTempSp (3)    | 114 | AV          | nviOaRHeatSTSP/nvoOaRHeatSTSP           | Control/Monitor | 16119, Holding | Outdoor Air Reset Heat Space Temperature Setpoint  |
| OaResetCoolSpaceTempSp (3)    | 115 | AV          | nviOaRCoolSTSP/nvoOaRCoolSTSP           | Control/Monitor | 16118, Holding | Outdoor Air Reset Cool Space Temperature Setpoint  |
| CO2SensorPpmMin (5)           | 116 | AV          | nviCo2PpmMin/nvoCo2PpmMin               | Control/Monitor | 16120, Holding | CO2 PPM level at 0V  |
| CO2SensorPpmMax (5)           | 117 | AV          | nviCo2PpmMax/nvoCo2PpmMax               | Control/Monitor | 16121, Holding | CO2 PPM level at 10V   |
| CO2ThresholdLimitOcc (5)      | 118 | AV          | nviCO2LimitOcc/nvoCO2LimitOcc           | Control/Monitor | 16122, Holding | CO2 sensor threshold limit for the fan/damper to operate when occupied                                 |
| CO2ThresholdLimitUnocc (5)    | 119 | AV          | nviCO2LimitUn/nvoCO2LimitUn             | Control/Monitor | 16141, Holding | CO2 sensor threshold limit for the fan/damper to operate when unoccupied                               |
| DynamicSpDiff (3)             | 120 | AV          | nviDynSpDiff/nvoDynSpDiff               | Control/Monitor | 16123, Holding | Dynamic Setpoint Differential  |
| DynamicSpOffset (3)           | 121 | AV          | nviDynSpOffset/nvoDynSpOffset           | Control/Monitor | 16124, Holding | Dynamic Setpoint Differential Offset   |
| DynamicSpHeatOa (3)           | 122 | AV          | nviDynSpHeatOa/nvoDynSpHeatOa           | Control/Monitor | 16125, Holding | Dynamic Setpoint Heat Outdoor Air  |
| DynamicSpCoolOa (3)           | 123 | AV          | nviDynSpCoolOa/nvoDynSpCoolOa           | Control/Monitor | 16126, Holding | Dynamic Setpoint Cool Outdoor Air  |
| ErWheelSpeed (2)              | 124 | AV          | nviErWheelSpeed/nvoErWheelSpeed         | Control/Monitor | 16127, Holding | Energy Wheel Speed Setting   |
| ErvExhaustFanSpeedOcc (2)     | 125 | AV          | nviErvEFSpeedOcc/nvoErvEFSpeedOcc       | Control/Monitor | 16128, Holding | Energy Wheel Exhaust Fan Speed Occupied  |
| ErvExhaustFanSpeedUnocc (2)   | 126 | AV          | nviErvEFSpeedUn/nvoErvEFSpeedUn         | Control/Monitor | 16129, Holding | Energy Wheel Exhaust Fan Speed Unoccupied  |
| ErvExhaustLowPsSpOcc (2)      | 127 | AV          | nviErvExLPSpOcc/nvoErvExLPSpOcc         | Control/Monitor | 16130, Holding | Energy Wheel Exhaust Low Pressure Setpoint Occupied  |
| ErvExhaustLowPsSpUnocc (2)    | 128 | AV          | nviErvExLPSpUn/nvoErvExLPSpUn           | Control/Monitor | 16131, Holding | Energy Wheel Exhaust Low Pressure Setpoint Unoccupied  |
| ErvExhaustHighPsSpOcc (2)     | 129 | AV          | nviErvExHPSpOcc/nvoErvExHPSpOcc         | Control/Monitor | 16132, Holding | Energy Wheel Exhaust High Pressure Setpoint Occupied   |
| ErvExhaustHighPsSpUnocc (2)   | 130 | AV          | nviErvExHPSpUn/nvoErvExHPSpUn           | Control/Monitor | 16133, Holding | Energy Wheel Exhaust High Pressure Setpoint Unoccupied   |

| Name                            | ID  | Object Type       | Lon SNVT Name                     | Function        | Modbus         | Description  |
|---------------------------------|-----|-------------------|-----------------------------------|-----------------|----------------|--|
| CO2OverrideHighLimitOcc (2)     | 131 | AV                | nviCO2OrHighOcc/nvoCO2OrHighOcc   | Control/Monitor | 16134, Holding | CO2 high limit setting at which fan/damper will operate occupied                 |
| CO2OverrideLowLimitOcc (2)      | 132 | AV                | nviCO2OrLowOcc/nvoCO2OrLowOcc     | Control/Monitor | 16135, Holding | CO2 low limit setting at which fan/damper will operate occupied                  |
| CO2OverrideHighLimitUnocc (2)   | 133 | AV                | nviCO2OrHighUn/nvoCO2OrHighUn     | Control/Monitor | 16143, Holding | CO2 high limit setting at which fan/damper will operate unoccupied               |
| CO2OverrideLowLimitUnocc (2)    | 134 | AV                | nviCO2OrLowUn/nvoCO2OrLowUn       | Control/Monitor | 16142, Holding | CO2 low limit setting at which fan/damper will operate unoccupied                |
| DryModeOASP (3)                 | 135 | AV                | nviDryModeOASP/nvoDryModeOASP     | Control/Monitor | 16137, Holding | Dry Mode Outdoor Air Setpoint  |
| DryModeCoolSP (3)               | 136 | AV                | nviDryModeCoolSP/nvoDryModeCoolSP | Control/Monitor | 16138, Holding | Dry Mode Cool Setpoint   |
| PoweredExhaustManVoltsOcc (2)   | 137 | AV                | nviEFManPwMOcc/nvoEFManPwMOcc     | Control/Monitor | 16139, Holding | Powered Exhaust PWM Setpoint Occupied  |
| PoweredExhaustManVoltsUnocc (2) | 138 | AV                | nviEFManPwMUnocc/nvoEFManPwMUnocc | Control/Monitor | 16140, Holding | Powered Exhaust PWM Setpoint Unoccupied  |
| UnitStatus (5)                  | 139 | Analog Input (AI) | nvoCurrentState                   | Monitor Only    | 2083, Input    | HVAC State (Idle = 0, Blower = 1, Heating = 2, Cooling = 3)                      |
| CurrentOccupiedStatus (5)       | 140 | AI                | nvoOccStatus                      | Monitor Only    | 2140, Input    | Occupancy status, occupied = 1, unoccupied = 0                                   |
| AverageSpaceTemp (5)            | 141 | AI                | nvoAvgSpaceTemp                   | Monitor Only    | 2144, Input    | Average Space Temperature  |
| BlowerFrequency (5)             | 142 | AI                | nvoBlowVDFreq                     | Monitor Only    | 2146, Input    | Blower VFD Frequency   |
| BlowerCurrent (5)               | 143 | AI                | nvoBlowVFDamps                    | Monitor Only    | 2150, Input    | Blower VFD Current   |
| BlowerPower (5)                 | 144 | AI                | nvoBlowVFDpower                   | Monitor Only    | 2152, Input    | Blower VFD Power   |
| AverageRh (5)                   | 145 | AI                | nvoAvgRh                          | Monitor Only    | 2190, Input    | Average space relative humidity  |
| OutdoorTemp (5)                 | 146 | AI                | nvoOutdoorTemp                    | Monitor Only    | 9057, Holding  | Outdoor Temperature  |
| ReturnTemp (5)                  | 147 | AI                | nvoReturnTemp                     | Monitor Only    | 9058, Holding  | Return Temperature   |
| DischargeTemp (5)               | 148 | AI                | nvoDischargeTemp                  | Monitor Only    | 9059, Holding  | Discharge Temperature  |
| IntakeTemp (5)                  | 149 | AI                | nvoIntakeTemp                     | Monitor Only    | 9060, Holding  | Intake Temperature   |
| SpaceTemp (5)                   | 150 | AI                | nvoSpaceTemp                      | Monitor Only    | 9061, Holding  | Space Temperature (thermistor)   |
| Hmi1Temp (5)                    | 151 | AI                | nvoHmi1Temp                       | Monitor Only    | 9063, Holding  | Unit HMI temperature   |
| Hmi2Temp (5)                    | 152 | AI                | nvoHmi2Temp                       | Monitor Only    | 9064, Holding  | Remote HMI 1 Temperature   |
| Hmi3Temp (5)                    | 153 | AI                | nvoHmi3Temp                       | Monitor Only    | 9065, Holding  | Remote HMI 2 Temperature   |
| Hmi4Temp (5)                    | 154 | AI                | nvoHmi4Temp                       | Monitor Only    | 9066, Holding  | Remote HMI 3 Temperature   |
| Hmi5Temp (5)                    | 155 | AI                | nvoHmi5Temp                       | Monitor Only    | 9067, Holding  | Remote HMI 4 Temperature   |
| SuctionLineTemp (5)             | 156 | AI                | nvoSucLineTemp                    | Monitor Only    | 9069, Holding  | Suction Line Temperature   |
| LiquidLineTemp (5)              | 157 | AI                | nvoLiqLineTemp                    | Monitor Only    | 9070, Holding  | Liquid Line Temperature  |
| EvapInDoorCoilTemp (5)          | 158 | AI                | nvoEvapCoilTemp                   | Monitor Only    | 9071, Holding  | Evaporator Coil Temperature  |
| CondOutdoorCoilTemp (5)         | 159 | AI                | nvoOutCoilTemp                    | Monitor Only    | 9072, Holding  | Condenser Coil Temperature   |
| CompressorDischargeTemp (5)     | 160 | AI                | nvoCompDisTemp                    | Monitor Only    | 9073, Holding  | Compressor Discharge Temperature   |
| IntakeRh (5)                    | 161 | AI                | nvoIntakeRh                       | Monitor Only    | 9078, Holding  | Intake Sensor Relative Humidity  |
| SpaceRh (5)                     | 162 | AI                | nvoSpaceRh                        | Monitor Only    | 9079, Holding  | Space Sensor Relative Humidity   |
| OutdoorRh (5)                   | 163 | AI                | nvoOutdoorRh                      | Monitor Only    | 1048, Holding  | Outdoor Sensor Relative Humidity   |
| DischargeRh (5)                 | 164 | AI                | nvoDischargeRh                    | Monitor Only    | 9090, Holding  | Discharge Sensor Relative Humidity   |
| ReturnRh (5)                    | 165 | AI                | nvoReturnRh                       | Monitor Only    | 9091, Holding  | Return Sensor Relative Humidity  |
| SuctionLinePs (5)               | 166 | AI                | nvoSucLinePs                      | Monitor Only    | 9092, Holding  | Suction Line Pressure  |
| DischargeLinePs (5)             | 167 | AI                | nvoDisLinePs                      | Monitor Only    | 9093, Holding  | Discharge Line Pressure  |
| LiquidLinePs (5)                | 168 | AI                | nvoLiqLinePs                      | Monitor Only    | 9094, Holding  | Liquid Line Pressure   |
| Hmi1Rh (5)                      | 169 | AI                | nvoHmi1Rh                         | Monitor Only    | 9097, Holding  | Unit HMI Relative Humidity   |
| Hmi2Rh (5)                      | 170 | AI                | nvoHmi2Rh                         | Monitor Only    | 9098, Holding  | Remote HMI 1 Relative Humidity   |
| Hmi3Rh (5)                      | 171 | AI                | nvoHmi3Rh                         | Monitor Only    | 9099, Holding  | Remote HMI 2 Relative Humidity   |
| Hmi4Rh (5)                      | 172 | AI                | nvoHmi4Rh                         | Monitor Only    | 9100, Holding  | Remote HMI 3 Relative Humidity   |
| Hmi5Rh (5)                      | 173 | AI                | nvoHmi5Rh                         | Monitor Only    | 9101, Holding  | Remote HMI 4 Relative Humidity   |
| SupplyPwmRate (5)               | 174 | AI                | nvoSupplyPwm                      | Monitor Only    | 1039, Holding  | PWM Signal to Supply Fan   |
| ExhaustPwmRate (5)              | 175 | AI                | nvoExhaustPwm                     | Monitor Only    | 1040, Holding  | PWM Signal to Exhaust Fan  |
| CondFan1PwmRate (5)             | 176 | AI                | nvoCond1PwmRate                   | Monitor Only    | 1041, Holding  | PWM Signal to set #1 of Condensing Fans  |
| CondFan2PwmRate (5)             | 177 | AI                | nvoCond2PwmRate                   | Monitor Only    | 1042, Holding  | PWM Signal to set #2 of Condensing Fans  |
| ModulatingGasValve1Output (5)   | 178 | AI                | nvoMGV1Output                     | Monitor Only    | 1046, Holding  | Controller output to the modulating gas valve #1. 0V = Low Fire, 10V = High Fire |
| ModulatingGasValve2Output (5)   | 179 | AI                | nvoMGV2Output                     | Monitor Only    | 1047, Holding  | Controller output to the modulating gas valve #2. 0V = Low Fire, 10V = High Fire |
| AdjustableDamperOutput (5)      | 180 | AI                | nvoDampOutput                     | Monitor Only    | 9085, Holding  | Output Voltage to Damper   |
| ElectricHeaterOutput (5)        | 181 | AI                | nvoElecHeatOut                    | Monitor Only    | 1051, Holding  | Output Voltage to Electric Heater  |
| OilBoostActiveFlag (5)          | 182 | Binary Input (BI) | nvoOilBoostON                     | Monitor Only    | 4000, Input    | 0 = Oil Boost Not Active, 1 = Oil Boost Active                                   |
| ReheatActiveFlag (5)            | 183 | BI                | nvoReheatON                       | Monitor Only    | 4001, Input    | 0 = Reheat Not Active, 1 = Reheat Active   |
| DefrostActiveFlag (5)           | 184 | BI                | nvoDefrostON                      | Monitor Only    | 4002, Input    | 0 = Defrost Not Active, 1 = Defrost Active                                       |
| PumpdownOffActiveFlag (5)       | 185 | BI                | nvoPumpOFFOn                      | Monitor Only    | 4003, Input    | 0 = Pumpdown Off Not Active, 1 = Pumpdown Off Active                             |
| PumpdownOnActiveFlag (5)        | 186 | BI                | nvoPumpONon                       | Monitor Only    | 4004, Input    | 0 = Pumpdown On Not Active, 1 = Pumpdown On Active                               |
| ReheatValvePosition (5)         | 187 | AI                | nvoReheatPos                      | Monitor Only    | 4028, Input    | Percentage of the Reheat Valve's Position  |
| EevValvePosition (5)            | 188 | AI                | nvoEevValvePos                    | Monitor Only    | 4029, Input    | Percentage of the EEV Valve's Position   |
| IntakeDpActual (5)              | 189 | AI                | nvoInDpActual                     | Monitor Only    | 4030, Input    | Actual Intake Dew Point Reading  |
| SpaceDpActual (5)               | 190 | AI                | nvoSpDpActual                     | Monitor Only    | 4032, Input    | Actual Space Dew Point Reading   |
| CompressorPower (5)             | 191 | AI                | nvoCompPower                      | Monitor Only    | 4062, Input    | Compressor Power Reading   |
| CompressorFrequency (5)         | 192 | AI                | nvoCompFreq                       | Monitor Only    | 4064, Input    | Compressor Frequency Reading   |
| CompressorCurrent (5)           | 193 | AI                | nvoCompAmps                       | Monitor Only    | 4066, Input    | Compressor Current Reading   |
| ERVExhaustAirRh (5)             | 194 | AI                | nvoERVExhRh                       | Monitor Only    | 4077, Input    | ERV Exhaust Air Relative Humidity  |
| ERVWheelSupplyPsInches (5)      | 195 | AI                | nvoERVSplyPs                      | Monitor Only    | 4078, Input    | ERV Wheel Supply Pressure Differential   |
| ERVWheelExhPsInches (5)         | 196 | AI                | nvoERVExhPs                       | Monitor Only    | 4081, Input    | ERV Wheel Exhaust Pressure Differential  |
| ERVExhCtrlVolts (5)             | 197 | AI                | nvoERVExhVolts                    | Monitor Only    | 4082, Input    | 0-10 Volt ERV Exhaust Speed Control  |
| ERVExhAirTemp (5)               | 198 | AI                | nvoERVExhTemp                     | Monitor Only    | 4083, Input    | ERV Exhaust Air Temperature  |

| Name                           | ID  | Object Type | Lon SNVT Name                         | Function        | Modbus         | Description  |
|--------------------------------|-----|-------------|---------------------------------------|-----------------|----------------|--|
| ERVOutsideAirRh (5)            | 199 | AI          | nvoERVOARh                            | Monitor Only    | 4084, Input    | ERV Outside Air Relative Humidity  |
| ERVOutsideAirTemp (5)          | 200 | AI          | nvoERVOATemp                          | Monitor Only    | 4085, Input    | ERV Outside Air Temperature  |
| ERVExhBlowerDutyCycle (5)      | 201 | AI          | nvoERVExhDuty                         | Monitor Only    | 4087, Input    | PWM Signal to Exhaust Fan ECM  |
| ERVExhBlowerPwmEnable (5)      | 202 | BI          | nvoERVExhPwmEn                        | Monitor Only    | 4088, Input    | 0 = Disable, 1 = Enable  |
| ERVWheelDutyCycle (5)          | 203 | AI          | nvoERVWheelDuty                       | Monitor Only    | 4089, Input    | PWM Signal to ERV Wheel ECM  |
| ERVWheelPwmEnable (5)          | 204 | BI          | nvoERVWheelPwmEn                      | Monitor Only    | 4090, Input    | 0 = Disable, 1 = Enable  |
| ERVState (5)                   | 205 | AI          | nvoERVState                           | Monitor Only    | 4113, Input    | 0 = Idle, 5 = Defrost, 6 = Clean, 7 = Test, 8 = Stop   |
| ERVAppliedWheelSpeed (5)       | 206 | AI          | nvoERVAppWSpeed                       | Monitor Only    | 4114, Input    | Desired Energy Wheel Fan Speed   |
| ERVAppliedExhFanSpeed (5)      | 207 | AI          | nvoERVAppEFSpeed                      | Monitor Only    | 4115, Input    | Desired ERV Exhaust Fan Speed  |
| Subcool (5)                    | 208 | AI          | nvoSubcool                            | Monitor Only    | 4132, Input    | Subcool Readings   |
| Superheat (5)                  | 209 | AI          | nvoSuperheat                          | Monitor Only    | 4133, Input    | Superheat Readings   |
| ActiveFault1 (5)               | 210 | AI          | nvoActiveFault0                       | Monitor Only    | 30501, Input   | Active Fault Code (see fault code table)   |
| ActiveFault2 (5)               | 211 | AI          | nvoActiveFault1                       | Monitor Only    | 30502, Input   | Active Fault Code (see fault code table)   |
| ActiveFault3 (5)               | 212 | AI          | nvoActiveFault2                       | Monitor Only    | 30503, Input   | Active Fault Code (see fault code table)   |
| ActiveFault4 (5)               | 213 | AI          | nvoActiveFault3                       | Monitor Only    | 30504, Input   | Active Fault Code (see fault code table)   |
| ActiveFault5 (5)               | 214 | AI          | nvoActiveFault4                       | Monitor Only    | 30505, Input   | Active Fault Code (see fault code table)   |
| ActiveFault6 (5)               | 215 | AI          | nvoActiveFault5                       | Monitor Only    | 30506, Input   | Active Fault Code (see fault code table)   |
| SchedulingEnabledFlag (4)      | 216 | BV          | nviSchedEnabled/nvoSchedEnabled       | Control/Monitor | 15016, Holding | Enable scheduling. Not an occupancy command. Refer to ID 5 "DDCOccupiedOverride" to toggle between occupied/unoccupied |
| HeatTemperModeOcc (2)          | 217 | AV          | nviHeatModeOcc/nvoHeatModeOcc         | Control/Monitor | 15055, Holding | Heat tempering mode during occupied time   |
| HeatTemperModeUnocc (2)        | 218 | AV          | nviHeatModeUnocc/nvoHeatModeUnocc     | Control/Monitor | 15056, Holding | Heat tempering mode during unoccupied time   |
| CoolTemperModeOcc (2)          | 219 | AV          | nviCoolModeOcc/nvoCoolModeOcc         | Control/Monitor | 15057, Holding | Cool tempering mode during occupied time   |
| CoolTemperModeUnocc (2)        | 220 | AV          | nviCoolModeUnocc/nvoCoolModeUnocc     | Control/Monitor | 15058, Holding | Cool tempering mode during unoccupied time   |
| ActivateOnOcc (2)              | 221 | AV          | nviActivateOcc/nvoActivateOcc         | Control/Monitor | 15059, Holding | "Activate based on" during occupied time   |
| ActivateOnUnocc (2)            | 222 | AV          | nviActivateUnocc/nvoActivateUnocc     | Control/Monitor | 15060, Holding | "Activate based on" during unoccupied time   |
| BlowerModeOcc (2)              | 223 | AV          | nviBlowModeOcc/nvoBlowModeOcc         | Control/Monitor | 15074, Holding | Blower mode during occupied times  |
| BlowerModeUnocc (2)            | 224 | AV          | nviBlowModeUnocc/nvoBlowModeUnocc     | Control/Monitor | 15075, Holding | Blower mode during unoccupied times  |
| MixingBoxMode (2)              | 225 | AV          | nviMBMode/nvoMBMode                   | Control/Monitor | 15089, Holding | Mixing Box mode selection  |
| ReheatDPAdjOcc (2)             | 226 | AV          | nviDPAdjOcc/nvoDPAdjOcc               | Control/Monitor | 15154, Holding | Reheat Dew Point adjust setpoint value when occupied   |
| ReheatDPAdjUnocc (2)           | 227 | AV          | nviDPAdjUnocc/nvoDPAdjUnocc           | Control/Monitor | 15155, Holding | Reheat Dew Point adjust setpoint value when unoccupied   |
| BlowerVfdMinFreqOcc (2)        | 228 | AV          | nviVFDMinFreqOcc/nvoVFDMinFreqOcc     | Control/Monitor | 15078, Holding | Min blower VFD Frequency when occupied   |
| BlowerVfdMinFreqUnocc (2)      | 229 | AV          | nviVFDMinFreqUnocc/nvoVFDMinFreqUnocc | Control/Monitor | 15079, Holding | Min blower VFD Frequency when unoccupied   |
| BlowerVfdMaxFreqOcc (2)        | 230 | AV          | nviVFDMaxFreqOcc/nvoVFDMaxFreqOcc     | Control/Monitor | 15080, Holding | Max blower VFD Frequency when occupied   |
| BlowerVfdMaxFreqUnocc (2)      | 231 | AV          | nviVFDMaxFreqUnocc/nvoVFDMaxFreqUnocc | Control/Monitor | 15081, Holding | Max blower VFD Frequency when unoccupied   |
| BlowerPwmMinRateOcc (2)        | 232 | AV          | nviPWMMinOcc/nvoPWMMinOcc             | Control/Monitor | 15082, Holding | Min blower ECM speed when occupied   |
| BlowerPwmMinRateUnocc (2)      | 233 | AV          | nviPWMMinUnocc/nvoPWMMinUnocc         | Control/Monitor | 15083, Holding | Min blower ECM speed when unoccupied   |
| BlowerPwmMaxRateOcc (2)        | 234 | AV          | nviPWMMaxOcc/nvoPWMMaxOcc             | Control/Monitor | 15084, Holding | Max blower ECM speed when occupied   |
| BlowerPwmMaxRateUnocc (2)      | 235 | AV          | nviPWMMaxUnocc/nvoPWMMaxUnocc         | Control/Monitor | 15085, Holding | Max blower ECM speed when unoccupied   |
| MixingBoxMinOAPercentOcc (2)   | 236 | AV          | nviMBMinOAPerOcc/nvoMBMinOAPerOcc     | Control/Monitor | 15092, Holding | Min occupied outdoor air percent when mixing box mode = outdoor air percent  |
| MixingBoxMinOAPercentUnocc (2) | 237 | AV          | nviMBMinOAPerUn/nvoMBMinOAPerUn       | Control/Monitor | 15093, Holding | Min unoccupied outdoor air percent when mixing box mode = outdoor air percent  |
| MixingBoxMaxOAPercentOcc (2)   | 238 | AV          | nviMBMaxOAPerOcc/nvoMBMaxOAPerOcc     | Control/Monitor | 15094, Holding | Max occupied outdoor air percent when mixing box mode = outdoor air percent  |
| MixingBoxMaxOAPercentUnocc (2) | 239 | AV          | nviMBMaxOAPerUn/nvoMBMaxOAPerUn       | Control/Monitor | 15095, Holding | Max unoccupied outdoor air percent when mixing box mode = outdoor air percent  |
| MixingBoxMinVoltsOcc (2)       | 240 | AV          | nviMBMinVoltsOcc/nvoMBMinVoltsOcc     | Control/Monitor | 15222, Holding | Max unoccupied mixing box voltage when mixing box mode = manual  |
| MixingBoxMinVoltsUnocc (2)     | 241 | AV          | nviMBMinVoltsUn/nvoMBMinVoltsUn       | Control/Monitor | 15223, Holding | Min unoccupied mixing box voltage when mixing box mode = manual  |
| MixingBoxMaxVoltsOcc (2)       | 242 | AV          | nviMBMaxVoltsOcc/nvoMBMaxVoltsOcc     | Control/Monitor | 15224, Holding | Max occupied mixing box voltage when mixing box mode = manual  |
| MixingBoxMaxVoltsUnocc (2)     | 243 | AV          | nviMBMaxVoltsUn/nvoMBMaxVoltsUn       | Control/Monitor | 15225, Holding | Max unoccupied mixing box voltage when mixing box mode = manual  |
| CFMReading (5)                 | 244 | AI          | nvoCFMReading                         | Read Only       | 2207, Input    | Fan CFM Reading  |
| PressureSensor1 (5)            | 245 | AI          | nvoPsSens1                            | Read Only       | 2224, Input    | Duct Static Pressure   |
| CO2Reading                     | 246 | AI          | nvoCO2Read                            | Read Only       | 2234, Input    | CO2 Reading in PPM   |
| ExternalSpaceTempEnable        | 247 | BV          | nvoExSpTempEn                         | Control/Monitor | 15534, Holding | Enable network space temperature   |
| ExternalSpaceTempValue         | 248 | AV          | nvoExSpTemp                           | Control/Monitor | 5207, Holding  | Network space temperature value, 1 decimal   |
| Stg2CompressorPower            | 249 | AI          | nvoCompPower2                         | Read Only       | 4174, Input    | Stage 2 Compressor Power Reading   |
| Stg2CompressorFrequency        | 250 | AI          | nvoCompFreq2                          | Read Only       | 4176, Input    | Stage 2 Compressor Frequency Reading   |
| Stg2CompressorCurrent          | 251 | AI          | nvoCompAmps2                          | Read Only       | 4178, Input    | Stage 2 Compressor Current Reading   |
| Stg3CompressorPower            | 252 | AI          | nvoCompPower3                         | Read Only       | 4195, Input    | Stage 3 Compressor Power Reading   |
| Stg3CompressorFrequency        | 253 | AI          | nvoCompFreq3                          | Read Only       | 4197, Input    | Stage 3 Compressor Frequency Reading   |
| Stg3CompressorCurrent          | 254 | AI          | nvoCompAmps3                          | Read Only       | 4199, Input    | Stage 3 Compressor Current Reading   |
| Stg2OilBoostActiveFlag         | 255 | BI          | nvoOilBoostON2                        | Read Only       | 4299, Input    | Stage 2: 0 = Oil Boost Not Active, 1 = Oil Boost Active  |
| Stg2ReheatActiveFlag           | 256 | BI          | nvoReheatON2                          | Read Only       | 4300, Input    | Stage 2: 0 = Reheat Not Active, 1 = Reheat Active  |
| Stg2DefrostActiveFlag          | 257 | BI          | nvoDefrostON2                         | Read Only       | 4301, Input    | Stage 2: 0 = Defrost Not Active, 1 = Defrost Active  |
| Stg2PumpdownOffActiveFlag      | 258 | BI          | nvoPumpOFFOn2                         | Read Only       | 4302, Input    | Stage 2: 0 = Pumpdown Off Not Active, 1 = Pumpdown Off Active  |
| Stg2PumpdownOnActiveFlag       | 259 | BI          | nvoPumpONOn2                          | Read Only       | 4303, Input    | Stage 2: 0 = Pumpdown On Not Active, 1 = Pumpdown On Active  |
| Stg2ReheatValvePosition        | 260 | AI          | nvoReheatPos2                         | Read Only       | 4268, Input    | Stage 2 Percentage of the Reheat Valve's Position  |
| Stg2EevValvePosition           | 261 | AI          | nvoEevValvePos2                       | Read Only       | 4269, Input    | Stage 2 Percentage of the EEV Valve's Position   |
| Stg3OilBoostActiveFlag         | 262 | BI          | nvoOilBoostON3                        | Read Only       | 4315, Input    | Stage 3: 0 = Oil Boost Not Active, 1 = Oil Boost Active  |
| Stg3ReheatActiveFlag           | 263 | AI          | nvoReheatON3                          | Read Only       | 4316, Input    | Stage 3: 0 = Reheat Not Active, 1 = Reheat Active  |
| Stg3DefrostActiveFlag          | 264 | AI          | nvoDefrostON3                         | Read Only       | 4317, Input    | Stage 3: 0 = Defrost Not Active, 1 = Defrost Active  |
| Stg3PumpdownOffActiveFlag      | 265 | AI          | nvoPumpOFFOn3                         | Read Only       | 4318, Input    | Stage 3: 0 = Pumpdown Off Not Active, 1 = Pumpdown Off Active  |
| Stg3PumpdownOnActiveFlag       | 266 | BI          | nvoPumpONOn3                          | Read Only       | 4319, Input    | Stage 3: 0 = Pumpdown On Not Active, 1 = Pumpdown On Active  |

| Name                    | ID  | Object Type | Lon SNVT Name                     | Function        | Modbus         | Description  |
|-------------------------|-----|-------------|-----------------------------------|-----------------|----------------|--|
| Stg3ReheatValvePosition | 267 | AI          | nvoReheatPos3                     | Read Only       | 4275, Input    | Stage 3 Percentage of the Reheat Valve's Position                                  |
| Stg3EevValvePosition    | 268 | AI          | nvoEevValvePos3                   | Read Only       | 4276, Input    | Stage 3 Percentage of the EEV Valve's Position                                     |
| ExternalSpaceRhEnable   | 269 | BV          | nviExSpaceRhEn/nvoExSpaceRhEn     | Control/Monitor | 15940, Holding | 0 = Disable, 1 = Enable  |
| ExternalSpaceRh         | 270 | AV          | nviExSpaceRh                      | Control/Monitor | 5222, Holding  | Virtual Relative Humidity Input  |
| PressureSensor2         | 271 | AI          | nvoPsSens2                        | Control/Monitor | 2236, Input    | Building Static Pressure   |
| StaticOaPsLowOcc        | 272 | AV          | nviStatOaPsLoOcc/nvoStatOaPsLoOcc | Control/Monitor | 16208, Holding | Space Static Pressure Low Setpoint when occupied for Outdoor Air Damper control    |
| StaticOaPsLowUnocc      | 273 | AV          | nviStatOaPsLoUn/nvoStatOaPsLoUn   | Control/Monitor | 16209, Holding | Space Static Pressure Low Setpoint when unoccupied for Outdoor Air Damper control  |
| StaticOaPsHighOcc       | 274 | AV          | nviStatOaPsHiOcc/nvoStatOaPsHiOcc | Control/Monitor | 16210, Holding | Space Static Pressure High Setpoint when occupied for Outdoor Air Damper control   |
| StaticOaPsLowUnocc      | 275 | AV          | nviStatOaPsHiUn/nvoStatOaPsHiUn   | Control/Monitor | 16211, Holding | Space Static Pressure High Setpoint when unoccupied for Outdoor Air Damper control |
| StaticPePsLowOcc        | 276 | AV          | nviStatPePsLoOcc/nvoStatPePsLoOcc | Control/Monitor | 5212, Holding  | PS based Powered Exhaust control low set point when occupied                       |
| StaticPePsLowUnocc      | 277 | AV          | nviStatPePsLoUn/nvoStatPePsLoUn   | Control/Monitor | 5213, Holding  | PS based Powered Exhaust control low set point when unoccupied                     |
| StaticPePsHighOcc       | 278 | AV          | nviStatPePsHiOcc/nvoStatPePsHiOcc | Control/Monitor | 5214, Holding  | PS based Powered Exhaust control high set point when occupied                      |
| StaticPePsHighUnocc     | 279 | AV          | nviStatPePsHiUn/nvoStatPePsHiUn   | Control/Monitor | 5215, Holding  | PS based Powered Exhaust control high set point when unoccupied                    |
| StatCtrlBlower          | 280 | BV          | nviStatCtrlBlow/nvoStatCtrlBlow   | Control/Monitor | 17000, Holding | Virtual 'call for blower' for Activate On Stat (0 = Off, 1 = On)                   |
| StatCtrlHeat            | 281 | BV          | nviStatCtrlHeat/nvoStatCtrlHeat   | Control/Monitor | 17001, Holding | Virtual 'call for heat' for Activate On Stat (0 = Off, 1 = On)                     |
| StatCtrlCool            | 282 | BV          | nviStatCtrlCool/nvoStatCtrlCool   | Control/Monitor | 17002, Holding | Virtual 'call for cool' for Activate On Stat (0 = Off, 1 = On)                     |
| StatCtrlDehumid         | 283 | BV          | nviStatCtrlDehum/nvoStatCtrlDehum | Control/Monitor | 17003, Holding | Virtual 'call for dehumidification' for Activate On Stat (0 = Off, 1 = ON)         |
| CfmKFactor              | 284 | AV          | nviCfmKFactor/nvoCfmKFactor       | Control/Monitor | 17004, Holding | Set K factor for airflow calculations  |
| Hmi1TempOffset          | 285 | AV          | nviHmi1TempOff/nvoHmi1TempOff     | Control/Monitor | 15697, Holding | Manual temperature offset (degrees) for HMI 1                                      |
| Hmi2TempOffset          | 286 | AV          | nviHmi2TempOff/nvoHmi2TempOff     | Control/Monitor | 15698, Holding | Manual temperature offset (degrees) for HMI 2                                      |
| Hmi3TempOffset          | 287 | AV          | nviHmi3TempOff/nvoHmi3TempOff     | Control/Monitor | 15699, Holding | Manual temperature offset (degrees) for HMI 3                                      |
| Hmi4TempOffset          | 288 | AV          | nviHmi4TempOff/nvoHmi4TempOff     | Control/Monitor | 15700, Holding | Manual temperature offset (degrees) for HMI 4                                      |
| Hmi1RhOffset            | 289 | AV          | nviHmi1RhOff/nvoHmi1RhOff         | Control/Monitor | 15702, Holding | Manual relative humidity offset (percent) for HMI 1                                |
| Hmi2RhOffset            | 290 | AV          | nviHmi2RhOff/nvoHmi2RhOff         | Control/Monitor | 15703, Holding | Manual relative humidity offset (percent) for HMI 2                                |
| Hmi3RhOffset            | 291 | AV          | nviHmi3RhOff/nvoHmi3RhOff         | Control/Monitor | 15704, Holding | Manual relative humidity offset (percent) for HMI 3                                |
| Hmi4RhOffset            | 292 | AV          | nviHmi4RhOff/nvoHmi4RhOff         | Control/Monitor | 15705, Holding | Manual relative humidity offset (percent) for HMI 4                                |
| ReturnAsSpace           | 293 | AV          | nviReturnAsSpace/nvoReturnAsSpace | Control/Monitor | 15037, Holding | Use Return temperature as Space temperature (0 = Off, 1 = ON)                      |

## DDC Faults

Refer to the **Troubleshooting** section of the **OIM** for more information.

| Code | Description              |
|------|--------------------------|
| 0    | None                     |
| 1    | FireDetect               |
| 2    | SmokeDetect              |
| 3    | SupplyOverload           |
| 4    | ExhaustOverload          |
| 5    | MasterRomCrc             |
| 6    | AuxRomCrc                |
| 7    | FlameProving             |
| 8    | IntakeFirestat           |
| 9    | DischargeFirestat        |
| 10   | Freezestat               |
| 11   | Overheat                 |
| 12   | HighTempLimit            |
| 13   | FireEyeAlarm             |
| 14   | GasHighPs                |
| 15   | GasLowPs                 |
| 16   | AuxGasHighPs             |
| 17   | AuxGasLowPs              |
| 18   | CoAlarm                  |
| 19   | EvapWaterPs              |
| 20   | EvapFloat                |
| 21   | DxFloat                  |
| 22   | FurnaceFloat             |
| 23   | BlowerVfdMbComm          |
| 24   | DoorInterlock            |
| 25   | ScrollDxVfdMbComm        |
| 26   | MuaToAuxMbComm           |
| 27   | IntakeDamperEnd          |
| 28   | DischargeDamperEnd       |
| 29   | BlowerAirProving         |
| 30   | CloggedFilter            |
| 31   | MissingSensorIntake      |
| 32   | BrokenSensorIntake       |
| 33   | MissingSensorDischarge   |
| 34   | BrokenSensorDischarge    |
| 35   | MissingSensorSpace       |
| 36   | BrokenSensorSpace        |
| 37   | MissingSensorOutsideAir  |
| 38   | BrokenSensorOutsideAir   |
| 39   | MissingSensorReturn      |
| 40   | BrokenSensorReturn       |
| 41   | MissingSensorSuctionLine |
| 42   | BrokenSensorSuctionLine  |
| 43   | MissingSensorIndoorCoil  |
| 44   | BrokenSensorIndoorCoil   |
| 45   | MissingSensorOutdoorCoil |
| 46   | BrokenSensorOutdoorCoil  |
| 47   | MissingSensorDxDischarge |
| 48   | BrokenSensorDxDischarge  |
| 49   | RtcTempSensor            |
| 50   | AuxRtcTempSensor         |
| 51   | Hmi0TempInvalid          |

| Code | Description             |
|------|-------------------------|
| 52   | Hmi1TempInvalid         |
| 53   | Hmi2TempInvalid         |
| 54   | Hmi3TempInvalid         |
| 55   | Hmi4TempInvalid         |
| 56   | ProofOfClosure          |
| 57   | LowFlameVoltage         |
| 58   | SpPressureLowLimit      |
| 59   | SpPressureHighLimit     |
| 60   | Fsc1HighTemp            |
| 61   | Fsc2HighTemp            |
| 62   | AuxFsc1HighTemp         |
| 63   | AuxFsc2HighTemp         |
| 64   | Fsc1Rollout             |
| 65   | Fsc2Rollout             |
| 66   | AuxFsc1Rollout          |
| 67   | AuxFsc2Rollout          |
| 68   | Fsc1VentProving         |
| 69   | Fsc2VentProving         |
| 70   | AuxFsc1VentProving      |
| 71   | AuxFsc2VentProving      |
| 72   | LowRefridgePs           |
| 73   | HighRefridgePs          |
| 74   | RefridgeDischargeTemp   |
| 75   | OilLow                  |
| 76   | DxEnvCondTempHigh       |
| 77   | DxEnvCondTempLow        |
| 78   | DxEnvEvapTempHigh       |
| 79   | DxEnvEvapTempLow        |
| 80   | DxEnvAngle              |
| 81   | MaxHeadPs               |
| 82   | EevPs                   |
| 83   | EevTemp                 |
| 84   | MinSuctionPs            |
| 85   | ElectricHeat            |
| 86   | SpaceRh                 |
| 87   | IntakeRh                |
| 88   | DischargeRh             |
| 89   | ScrollDxVfdNotAutoOn    |
| 90   | MissingSensorLiquidLine |
| 91   | BrokenSensorLiquidLine  |
| 92   | HmiMbComm0              |
| 93   | HmiMbComm1              |
| 94   | HmiMbComm2              |
| 95   | HmiMbComm3              |
| 96   | HmiMbComm4              |
| 97   | DnfsPwrCardTemp         |
| 98   | DnfsEarthFault          |
| 99   | DnfsCtrlCardTemp        |
| 100  | DnfsCtrlWordTimeout     |
| 101  | DnfsOverCurrent         |
| 102  | DnfsTorqueLimit         |
| 103  | DnfsMotorEtrOver        |

| Code | Description             |
|------|-------------------------|
| 104  | DnfsInverterOvld        |
| 105  | DnfsDcUnderVolt         |
| 106  | DnfsDcOverVolt          |
| 107  | DnfsShortCircuit        |
| 108  | DnfsInrushFault         |
| 109  | DnfsMainsPhaseLoss      |
| 110  | DnfsInternalFault       |
| 111  | DnfsUPhaseLoss          |
| 112  | DnfsVPhaseLoss          |
| 113  | DnfsWPhaseLoss          |
| 114  | Dnfs24vSupplyLow        |
| 115  | DnfsMainsFail           |
| 116  | DnfsDriveInit           |
| 117  | DnfsSafeStop            |
| 118  | DnfsStartFail           |
| 119  | DnfsSpeedLimit          |
| 120  | DnfsCurrentLimit        |
| 121  | Co2ShutdownRequired     |
| 122  | Co2Override             |
| 123  | ErvSupplyCloggedFilter  |
| 124  | ErvExhaustCloggedFilter |
| 125  | ErvDeadbandFail         |
| 126  | ErvExhaustAirProving    |
| 127  | Vfd571IgbtTemp          |
| 128  | Vfd571Output            |
| 129  | Vfd571Ground            |
| 130  | Vfd571Temp              |
| 131  | Vfd571FlyingStart       |
| 132  | Vfd571HighDcBus         |
| 133  | Vfd571LowDcBus          |
| 134  | Vfd571Overload          |
| 135  | Vfd571Oem               |
| 136  | Vfd571IllegalSetup      |
| 137  | Vfd571DynamicBrake      |
| 138  | Vfd571PhaseLost         |
| 139  | Vfd571External          |
| 140  | Vfd571Control           |
| 141  | Vfd571Start             |
| 142  | Vfd571IncompatParamSet  |
| 143  | Vfd571EpmHw             |
| 144  | Vfd571Internal1         |
| 145  | Vfd571Internal2         |
| 146  | Vfd571Internal3         |
| 147  | Vfd571Internal4         |
| 148  | Vfd571Internal5         |
| 149  | Vfd571Internal6         |
| 150  | Vfd571Internal7         |
| 151  | Vfd571Internal8         |
| 152  | Vfd571Personality       |
| 153  | Vfd571Internal10        |
| 154  | Vfd571RemoteKeypadLost  |
| 155  | Vfd571AssertionLevel    |



| Code | Description             |
|------|-------------------------|
| 156  | Vfd571Internal11        |
| 157  | Vfd571Internal12        |
| 158  | Vfd571Internal13        |
| 159  | Vfd571Internal14        |
| 160  | Vfd571CommModuleFail    |
| 161  | Vfd571Network           |
| 162  | Vfd571Network1          |
| 163  | Vfd571Network2          |
| 164  | Vfd571Network3          |
| 165  | Vfd571Network4          |
| 166  | Vfd571Network5          |
| 167  | Vfd571Network6          |
| 168  | Vfd571Network7          |
| 169  | Vfd571Network8          |
| 170  | Vfd571Network9          |
| 171  | ReturnRh                |
| 172  | ErvExhaustRh            |
| 173  | OutsideRh               |
| 174  | Co2Threshold            |
| 175  | ErvDoorInterlock        |
| 176  | ExternalInterlockActive |
| 177  | Missing2ndEvapSensor    |
| 178  | Broken2ndEvapSensor     |
| 179  | ErvSupplyMissingFilter  |
| 180  | ErvExhaustMissingFilter |
| 181  | AcbMbComm               |
| 182  | ExhFanContactor1Prv     |
| 183  | ExhFanContactor2Prv     |
| 184  | MissingSensorHmi0       |
| 185  | MissingSensorHmi1       |
| 186  | MissingSensorHmi2       |
| 187  | MissingSensorHmi3       |
| 188  | MissingSensorHmi4       |
| 189  | BrokenSensorHmi0        |
| 190  | BrokenSensorHmi1        |
| 191  | BrokenSensorHmi2        |
| 192  | BrokenSensorHmi3        |
| 193  | BrokenSensorHmi4        |
| 194  | OaDamperLockout         |
| 195  | VfdCoolStg2MbComm       |
| 196  | VfdCoolStg3MbComm       |
| 197  | Vfd571CS2IgbtTemp       |
| 198  | Vfd571CS2Output         |
| 199  | Vfd571CS2Ground         |
| 200  | Vfd571CS2Temp           |
| 201  | Vfd571CS2FlyingStart    |
| 202  | Vfd571CS2HighDcBus      |
| 203  | Vfd571CS2LowDcBus       |
| 204  | Vfd571CS2Overload       |
| 205  | Vfd571CS2Oem            |
| 206  | Vfd571CS2IllegalSetup   |
| 207  | Vfd571CS2DynamicBrake   |
| 208  | Vfd571CS2PhaseLost      |
| 209  | Vfd571CS2External       |
| 210  | Vfd571CS2Control        |

| Code | Description               |
|------|---------------------------|
| 211  | Vfd571CS2Start            |
| 212  | Vfd571CS2IncompatParamSet |
| 213  | Vfd571CS2EpmHw            |
| 214  | Vfd571CS2Internal1        |
| 215  | Vfd571CS2Internal2        |
| 216  | Vfd571CS2Internal3        |
| 217  | Vfd571CS2Internal4        |
| 218  | Vfd571CS2Internal5        |
| 219  | Vfd571CS2Internal6        |
| 220  | Vfd571CS2Internal7        |
| 221  | Vfd571CS2Internal8        |
| 222  | Vfd571CS2Personality      |
| 223  | Vfd571CS2Internal10       |
| 224  | Vfd571CS2RemoteKeypadLost |
| 225  | Vfd571CS2AssertionLevel   |
| 226  | Vfd571CS2Internal11       |
| 227  | Vfd571CS2Internal12       |
| 228  | Vfd571CS2Internal13       |
| 229  | Vfd571CS2Internal14       |
| 230  | Vfd571CS2CommModuleFail   |
| 231  | Vfd571CS2Network          |
| 232  | Vfd571CS2Network1         |
| 234  | Vfd571CS2Network2         |
| 235  | Vfd571CS2Network3         |
| 236  | Vfd571CS2Network4         |
| 237  | Vfd571CS2Network5         |
| 238  | Vfd571CS2Network6         |
| 239  | Vfd571CS2Network7         |
| 240  | Vfd571CS2Network8         |
| 241  | Vfd571CS2Network9         |
| 242  | Vfd571CS3IgbtTemp         |
| 243  | Vfd571CS3Output           |
| 244  | Vfd571CS3Temp             |
| 245  | Vfd571CS3FlyingStart      |
| 246  | Vfd571CS3HighDcBus        |
| 247  | Vfd571CS3LowDcBus         |
| 248  | Vfd571CS3Overload         |
| 249  | Vfd571CS3Oem              |
| 250  | Vfd571CS3IllegalSetup     |
| 251  | Vfd571CS3DynamicBrake     |
| 252  | Vfd571CS3PhaseLost        |
| 253  | Vfd571CS3External         |
| 254  | Vfd571CS3Control          |
| 255  | Vfd571CS3Start            |
| 256  | Vfd571CS3IncompatParamSet |
| 257  | Vfd571CS3EpmHw            |
| 258  | Vfd571CS3Internal1        |
| 259  | Vfd571CS3Internal2        |
| 260  | Vfd571CS3Internal3        |
| 261  | Vfd571CS3Internal4        |
| 262  | Vfd571CS3Internal5        |
| 263  | Vfd571CS3Internal6        |
| 264  | Vfd571CS3Internal7        |
| 265  | Vfd571CS3Internal8        |
| 266  | Vfd571CS3Personality      |

| Code | Description                 |
|------|-----------------------------|
| 267  | Vfd571CS3Internal10         |
| 268  | Vfd571CS3RemoteKeypadLost   |
| 269  | Vfd571CS3AssertionLevel     |
| 270  | Vfd571CS3Internal11         |
| 271  | Vfd571CS3Internal12         |
| 272  | Vfd571CS3Internal13         |
| 273  | Vfd571CS3Internal14         |
| 274  | Vfd571CS3CommModuleFail     |
| 275  | Vfd571CS3Network            |
| 276  | Vfd571CS3Network1           |
| 277  | Vfd571CS3Network2           |
| 278  | Vfd571CS3Network3           |
| 279  | Vfd571CS3Network4           |
| 280  | Vfd571CS3Network5           |
| 281  | Vfd571CS3Network6           |
| 282  | Vfd571CS3Network7           |
| 283  | Vfd571CS3Network8           |
| 284  | Vfd571CS3Network9           |
| 285  | AcbMscMbComm                |
| 286  | CoolStg2MaxHeadPs           |
| 287  | CoolStg2MinSuctionPs        |
| 288  | CoolStg2EevTemp             |
| 289  | CoolStg2MissSensorSuctLine  |
| 290  | CoolStg2BrkSensorSuctLine   |
| 291  | CoolStg2MissSensorLiqLine   |
| 292  | CoolStg2BrkSensorLiqLine    |
| 293  | CoolStg2MissSensorDischLine |
| 294  | CoolStg2BrkSensorDischLine  |
| 295  | CoolStg3MaxHeadPs           |
| 296  | CoolStg3MinSuctionPs        |
| 297  | CoolStg3EevTemp             |
| 298  | CoolStg3MissSensorSuctLine  |
| 299  | CoolStg3BrkSensorSuctLine   |
| 300  | CoolStg3MissSensorLiqLine   |
| 301  | CoolStg3BrkSensorLiqLine    |
| 302  | CoolStg3MissSensorDischLine |
| 303  | CoolStg3BrkSensorDischLine  |
| 304  | DnfsCs2PwrCardTemp          |
| 305  | DnfsCs2EarthFault           |
| 306  | DnfsCs2CtrlCardTemp         |
| 307  | DnfsCs2CtrlWordTimeout      |
| 308  | DnfsCs2OverCurrent          |
| 309  | DnfsCs2TorqueLimit          |
| 310  | DnfsCs2MotorEtrOver         |
| 311  | DnfsCs2InverterOvld         |
| 312  | DnfsCs2DcUnderVolt          |
| 313  | DnfsCs2DcOverVolt           |
| 314  | DnfsCs2ShortCircuit         |
| 315  | DnfsCs2InrushFault          |
| 316  | DnfsCs2MainsPhaseLoss       |
| 317  | DnfsCs2InternalFault        |
| 318  | DnfsCs2UPhaseLoss           |
| 319  | DnfsCs2VPhaseLoss           |
| 320  | DnfsCs2WPhaseLoss           |
| 321  | DnfsCs224vSupplyLow         |

| Code | Description            |
|------|------------------------|
| 322  | DnfsCs2MainsFail       |
| 323  | DnfsCs2DriveInit       |
| 324  | DnfsCs2SafeStop        |
| 325  | DnfsCs2StartFail       |
| 326  | DnfsCs2SpeedLimit      |
| 327  | DnfsCs2CurrentLimit    |
| 328  | DnfsCs3PwrCardTemp     |
| 329  | DnfsCs3EarthFault      |
| 330  | DnfsCs3CtrlCardTemp    |
| 331  | DnfsCs3CtrlWordTimeout |
| 332  | DnfsCs3OverCurrent     |
| 333  | DnfsCs3TorqueLimit     |
| 334  | DnfsCs3MotorEtrOver    |
| 335  | DnfsCs3InverterOvld    |
| 336  | DnfsCs3DcUnderVolt     |
| 337  | DnfsCs3DcOverVolt      |
| 338  | DnfsCs3ShortCircuit    |
| 339  | DnfsCs3InrushFault     |
| 340  | DnfsCs3MainsPhaseLoss  |
| 341  | DnfsCs3InternalFault   |
| 342  | DnfsCs3UPhaseLoss      |
| 343  | DnfsCs3VPhaseLoss      |
| 344  | DnfsCs3WPhaseLoss      |
| 345  | DnfsCs324vSupplyLow    |
| 346  | DnfsCs3MainsFail       |
| 347  | DnfsCs3DriveInit       |
| 348  | DnfsCs3SafeStop        |
| 349  | DnfsCs3StartFail       |
| 350  | DnfsCs3SpeedLimit      |
| 351  | DnfsCs3CurrentLimit    |
| 352  | Scroll2DxVfdNotAutoOn  |
| 353  | Scroll3DxVfdNotAutoOn  |
| 354  | Dx2EnvCondTempHigh     |

| Code | Description            |
|------|------------------------|
| 355  | Dx2EnvCondTempLow      |
| 356  | Dx2EnvEvapTempHigh     |
| 357  | Dx2EnvEvapTempLow      |
| 358  | Dx2EnvAngle            |
| 359  | Dx3EnvCondTempHigh     |
| 360  | Dx3EnvCondTempLow      |
| 361  | Dx3EnvEvapTempHigh     |
| 362  | Dx3EnvEvapTempLow      |
| 363  | Dx3EnvAngle            |
| 364  | Dx2OilLow              |
| 365  | Dx3OilLow              |
| 366  | BrokenAirPsSensor      |
| 367  | BlowerAirProvingLowPs  |
| 355  | Dx2EnvCondTempLow      |
| 356  | Dx2EnvEvapTempHigh     |
| 357  | Dx2EnvEvapTempLow      |
| 358  | Dx2EnvAngle            |
| 359  | Dx3EnvCondTempHigh     |
| 360  | Dx3EnvCondTempLow      |
| 361  | Dx3EnvEvapTempHigh     |
| 362  | Dx3EnvEvapTempLow      |
| 363  | Dx3EnvAngle            |
| 364  | Dx2OilLow              |
| 365  | Dx3OilLow              |
| 366  | BrokenAirPsSensor      |
| 367  | BlowerAirProvingLowPs  |
| 368  | BlowerAirProvingHighPs |
| 369  | FscMaxCycles           |
| 370  | Stg2LowRefridgePs      |
| 371  | Stg2HighRefridgePs     |
| 372  | Stg2RefridgeDischTemp  |
| 373  | Stg3LowRefridgePs      |
| 374  | Stg3HighRefridgePs     |

| Code | Description             |
|------|-------------------------|
| 375  | Stg3RefridgeDischTemp   |
| 376  | SpaceTempDisabled       |
| 377  | EconoDamperClosed       |
| 378  | EconoExcessOa           |
| 379  | EconoNoEcono            |
| 380  | EconoEconoFault         |
| 381  | EconoDamperFault        |
| 382  | SysInfoCrcFault         |
| 383  | UserSettingCrcFault     |
| 384  | FireeyePilotLost        |
| 385  | FireeyeMainLost         |
| 386  | MaxStg1LowOilStops      |
| 387  | MaxStg2LowOilStops      |
| 388  | MaxStg3LowOilStops      |
| 389  | ProfilePsLow            |
| 390  | ProfilePsHigh           |
| 391  | SltC1Diff               |
| 392  | SltC2Diff               |
| 393  | SltC3Diff               |
| 394  | MissSensorSecS1SuctLine |
| 395  | BrkSensorSecS1SuctLine  |
| 396  | MissSensorSecS2SuctLine |
| 397  | BrkSensorSecS2SuctLine  |
| 398  | MissSensorSecS3SuctLine |
| 399  | BrkSensorSecS3SuctLine  |
| 400  | HighDuctPsAlarm         |
| 401  | LowBldgAlarm            |
| 402  | HighBldgPsAlarm         |