| Johnson Controls | PACKAGED ROOFTOP UNITS | |
|---|---|---|
| START-UP GUIDE | NEW RELEASE | Form 100.50-SU8 (116) |

# CONTROL SEQUENCES
# SERIES 100
# 50–130 TON - MOD F
# 120–150 TON - MOD G
# 50 HZ AND 60 HZ
# R-410A


Issue Date:
January 28, 2016

# IMPORTANT!

## READ BEFORE PROCEEDING!

### GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During rigging, installation, operation, maintenance, or service, individuals may be exposed to certain components or conditions including, but not limited to: heavy objects, refrigerants, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of rigging, installation, and operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized rigging, installation, and operating/service personnel. It is expected that these individuals possess independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood the on-product labels, this document and any referenced materials. This individual shall also be familiar with and comply with all applicable industry and governmental standards and regulations pertaining to the task in question.

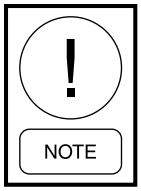
### SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to specific situations:


***Indicates a possible hazardous situation which will result in death or serious injury if proper care is not taken.***


***Identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution if proper care is not taken or instructions and are not followed.***


***Indicates a potentially hazardous situation which will result in possible injuries or damage to equipment if proper care is not taken.***




***Highlights additional information useful to the technician in completing the work being performed properly.***


***External wiring, unless specified as an optional connection in the manufacturer's product line, is not to be connected inside the control cabinet. Devices such as relays, switches, transducers and controls and any external wiring must not be installed inside the micro panel. All wiring must be in accordance with Johnson Controls' published specifications and must be performed only by a qualified electrician. Johnson Controls will NOT be responsible for damage/problems resulting from improper connections to the controls or application of improper control signals. Failure to follow this warning will void the manufacturer's warranty and cause serious damage to property or personal injury.***

# CHANGEABILITY OF THIS DOCUMENT

In complying with Johnson Controls' policy for continuous product improvement, the information contained in this document is subject to change without notice. Johnson Controls makes no commitment to update or provide current information automatically to the manual or product owner. Updated manuals, if applicable, can be obtained by contacting the nearest Johnson Controls Service office or accessing the Johnson Controls QuickLIT website at http://cgproducts.johnsoncontrols.com.

It is the responsibility of rigging, lifting, and operating/service personnel to verify the applicability of these documents to the equipment. If there is any question regarding the applicability of these documents, rigging, lifting, and operating/service personnel should verify whether the equipment has been modified and if current literature is available from the owner of the equipment prior to performing any work on the chiller.

## CHANGE BARS

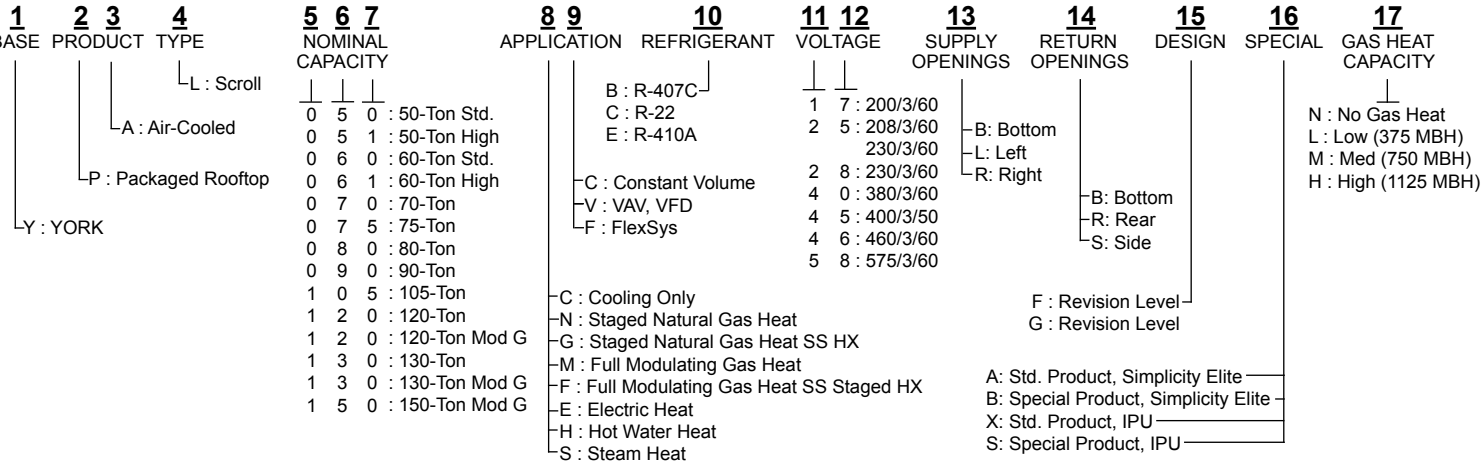
Revisions made to this document are indicated with a line along the left or right hand column in the area the revision was made. These revisions are to technical information and any other changes in spelling, grammar or formatting are not included.

# ASSOCIATED LITERATURE

| MANUAL DESCRIPTION | FORM NUMBER |
|---|---|
| Installation, Operation, and Maintenance 50-65 Ton Unit, Mod F | 100.50-NOM5 |
| Installation, Operation, and Maintenance 70-105 Ton Unit, Mod F | 100.50-NOM9 |
| Installation, Operation, and Maintenance 120-130 Ton Unit, Mod F | 100.50-NOM10 |
| Installation, Operation, and Maintenance 120-150 Ton Unit, Mod G | 100.50-NOM11 |

# NOMENCLATURE

## BASE MODEL NUMBER



# TABLE OF CONTENTS

# TABLE OF CONTENTS (CONT'D)



# LIST OF FIGURES



# LIST OF TABLES

# SECTION 1 - INTRODUCTION



The Series 100 unit is a large tonnage rooftop unit, with sizes ranging from 50-150 tons. It can be configured to run as a Constant Volume unit, a Multizone Variable Air Volume (VAV) unit, Single Zone VAV, or as a Flex-Sys (underfloor air) unit. There are many different options that can be added to the machine, which will add to its complexity.

This start up guide indicates control sequences to provide proper unit operation. This guide does not include installation information. Please refer to the proper Installation, Operation, and Maintenance (IOM) manual for this information.

- 50-65 ton units, Mod F: Form 100.50-NOM5 (1115)
- 70-105 ton units, Mod F: Form 100.50-NOM9 (1115)
- 120-130 ton units, Mod F: Form 100.50-NOM10 (1115)
- 120-150 ton units, Mod G: Form 100.50-NOM11 (1115)

In addition, any system alarms indicated by the User Interface should be diagnosed as referenced in the appropriate IOM. You can refer to the Fault Description Table located in the Service section of the IOM.

THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 2 - CONNECTING BAS TO A SERIES 100/YPAL UNIT WITH THE IPU CONTROLLER



A Series 100/YPAL rooftop unit with the IPU controller ships from the factory ready to connect and communicate with a Building Automation System utilizing BACnet MS/TP protocol.

The S100/YPAL unit can also communicate via BACnet IP, LON or N2 with the addition of a field provided/installed component.

## BACNET MS/TP

- Communication wires MUST be connected to Port 1 using only terminals 3 and 4. Connecting wires to any of the other terminals could result in erratic or no communication. (See Figure 1)
    a. Terminal 3: Receive (+)
    b. Terminal 4: Transmit (-)
- MAC address can be set using dip switch SW2 or in the Service Key. Preferred method is through the Service Key. This prevents someone accidentally hitting a dipswitch key and changing the MAC address
- Using the Service Key to set the MAC address
    a. Press the Service Key on the keyboard
    b. Enter the level 2 password, 9725 and press the checkmark
    c. The screen should display “Data Log Format”. If not, press the Service key again, and “Data Log Format” should appear
    d. Use the UP arrow to scroll up through the menu until the screen displays “P1 Stop Bits =1”
    e. This is the part of the menu for Port 1
    f. Press the UP arrow again to “P1 Protocol” Should be set to BACnet
    g. Use the UP arrow again until the screen displays “P1 Manual Mac Address”. If the value is set to -1, the unit address is set by the dipswitches. Press the checkmark key and enter the MAC address for the unit using the numbered section of the keypad, then press the checkmark to accept this value
    h. Use the UP arrow again to find the “P1 Baud Rate” Set this value to the required Baud Rate.
    i. Press the “X” key on the keypad to exit the programming menu
    j. Cycle main power OFF then ON for new values to be locked in.
- The S100 unit is now ready to communicate to the BAS

## BACNET IP

- Since the IPU controller does not have a functional IP port, a gateway must be used.
- We recommend using a JCI NCE (MS-NCE2560-0)
- The gateway will be connected to Port 1 on the IPU controller like above (See *Figure 1 on page 10*)

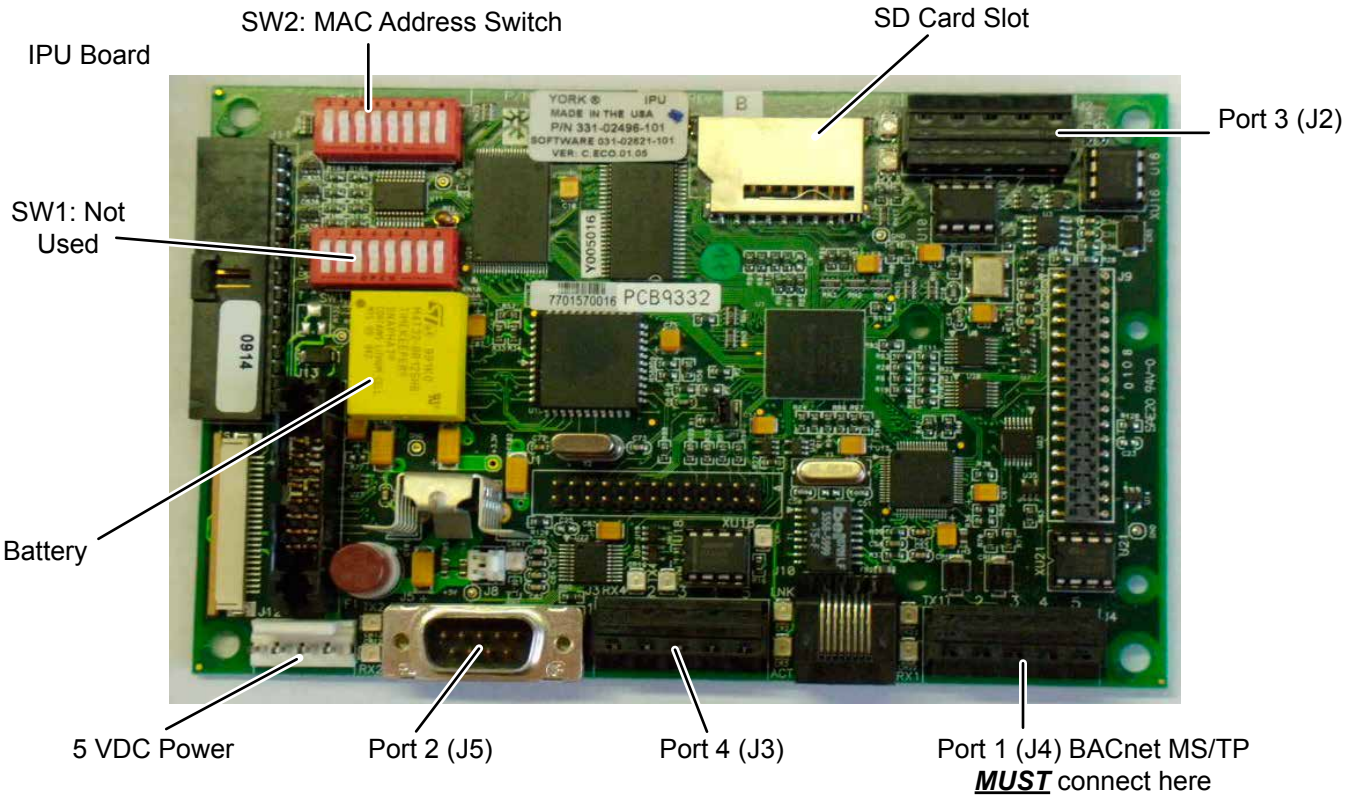



**FIGURE 1 -** IPU CONTROLLER PORT LOCATIONS

## LON

- To communicate to a BAS utilizing LON protocol, a JCI E-Link must be used
  a. YK-ELNK101-0
  b. YK-ELNKE01-1 (with enclosure)
- The wires from the E-Link to the IPU controller will be connected to Port 1 (See *Figure 1 on page 10*)
- P1 Protocol set to BACnet. See above under BACnet MS/TP to locate P1 Protocol in the Service Menu

See *Figure 2 on page 11* for addressing the E-Link to the IPU Controller.

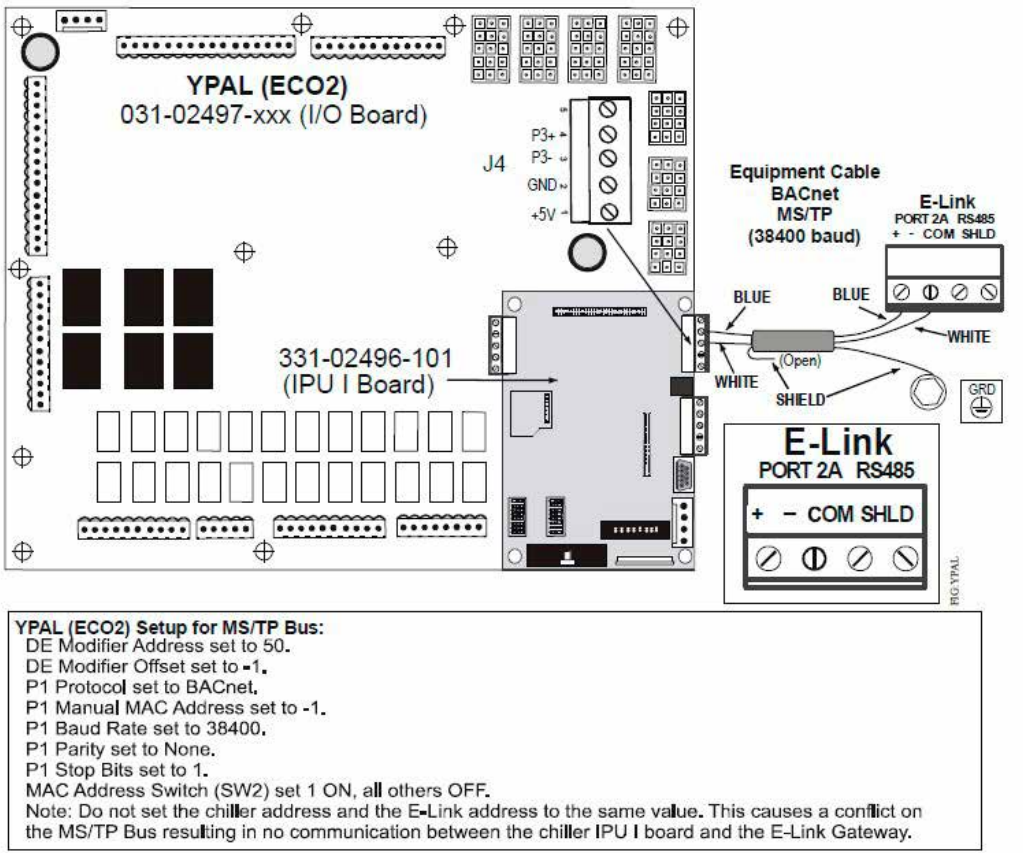



**FIGURE 2 -** E-LINK CONNECTIONS AND ADDRESSING INSTRUCTIONS

## N2

- To communicate to a BAS utilizing N2, a JCI E-Link must be used
  a. YK-ELNK100-0
  b. YK-ELNKE00-0 (with enclosure)
- The wires from the E-Link to the IPU controller will be connected to Port 1 (See Figure 1)
- P1 Protocol set to BACnet. See above under BACnet MS/TP to locate P1 Protocol in the Service Menu

See *Figure 2 on page 11* for addressing the E-Link to the IPU Controller

## OTHER PROTOCOLS

- The IPU controller is also capable of communicating with other BAS protocols
  a. MODBUS Server
  b. MODBUS Client
  c. MODBUS I/O
  d. Terminal
  e. API

## END OF LINE TERMINATION

- While it is not always required to have End-of-Line Termination, it is strongly recommended
- For BACnet MS/TP and N2 protocols, JCI factory recommends using our End-Of-Line Terminator, p/n: MS-BACEOL-0
- Other communication protocols may need to provide/install their own end-of-line terminators if applicable

## MISCELLANEOUS

- Whenever a change is made to a communication setting, please cycle power on/off to the unit to "lock in" the new setting
- Points list are available in section 6 of the unit Installation, Operation, and Maintenance manual for BACnet MS/TP, BACnet IP, MODBUS, LON, and N2

## TECHNICAL SUPPORT

- For technical support on connecting to and communicating with the IPU controller in the Series 100 rooftop unit, please contact Applied DX Product Technical Support
  a. 1-877-329-7430 option 2
  b. applieddxtechsupport@jci.com
- For technical support with E-Links or End-of-Line termination, please contact the Field Support Center
  a. 1-800-524-1330 options 6-1-2

# SECTION 3 - UNIT MODE



There are numerous operating modes for the Series 100 unit depending on the unit configuration. The list of unit configurations below list describes the different unit modes and what type configuration they apply to.

Unit Configurations:

1. Constant Volume (CV) Eliminated after 12/31/15
2. Single Zone VAV (SZ VAV) Added 9/1/15
3. Variable Air Volume (VAV)
4. Flexsys

UNIT_MODE (AI58): Displays the Series 100 Current Operating Mode

0. OCC COOLING (VAV)
1. OCC COOLING LOW (CV or SZ VAV)
2. OCC COOLING HIGH (CV or SZ VAV)
3. OCC COOLING w/ BYPASS (FLEXSYS)
4. OCC COOLING w/o BYPASS (FLEXSYS)
5. OCC HEATING (VAV or FLEXSYS)
6. OCC HEATING LOW (CV or SZ VAV)
7. OCC HEATING (CV or SZ VAV)
8. OCC STANDBY ( All Configurations)
9. UNOCC COOLING (VAV or FLEXSYS)
10. UNOCC COOLING LOW (CV or SZ VAV)
11. UNOCC COOLING HIGH (CV or SZ VAV)
12. UNOCC HEATING (VAV or FLEXSYS)

UNOCC HEATIING LOW (CV or SZ VAV)

14. UNOCC HEATING HIGH (CV or SZ VAV)
15. UNOCC STANDBY (All Configurations)
16. COMFORT VENT COOLING (CV or SZ VAV)
17. COMFORT VENT HEATING (CV or SZ VAV)
18. NIGHT SET BACK ( All Configurations)
19. MORNING WARMUP (All Configurations)
20. POWER UP STANDBY (All configurations)

The BAS will show the numeric value for the Unit Mode. It will be the programmer's responsibility to translate the numeric value to the actual verbiage for graphic display purposes.

THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 4 - OCCUPIED/UNOCCUPIED OPERATION

The Series 100 can be placed into Occupied/Unoccupied modes by three different methods:

1. 24 VAC to the OCC terminal on CTB1
2. Using the internal clock schedule built into the unit controller
3. Commands from a Building Automation System

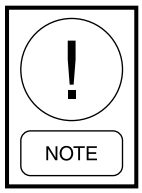
The three methods listed above are listed in the order of priority. (i.e., if 24 VAC is applied to OCC at CTB1, neither the internal clock schedule nor the BAS can command the unit to Unoccupied.)

If the BAS is experiencing difficulties placing the unit into the Unoccupied mode, please ensure that 24 VAC is not present at the OCC terminal on CTB1 and the internal clock schedule is “User Disabled.”

- OCCUPNCY_CMD (AV88 or BV12): A BAS command that places the unit into the OCC mode
- OCC_STATE (BI36): Displays the status of the Hardwired Input
- OCC_MODE (BI35): Displays the OCC/UNOCC with Hardwired, Internal Schedule, or BAS command

THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 5 - COMMANDING THERMOSTAT INPUTS FROM THE BAS




***Constant Volume (CV) configuration was discontinued in December of 2015.***

The Series 100 with IPU controller can accept thermostat commands from a BAS (Building Automation System). This would allow a unit configured for Constant Volume to operate without connecting a thermostat to the unit. This allows a controls engineer to determine when the unit starts and stops cooling or heating.

The following list describes the different Bacnet points that can be used in place of a thermostat

- Y1_LOW_COOL_B: AV98 or BV22 (First stage cooling command)
- Y2_HIGH_COOL_B: AV99 or BV23 (Second stage cooling command)
- W1_LOW_HEAT_B: AV96 or BV20 (First stage heating command)
- W2_HIGH_HEAT_B: AV97 or BV21 (Second stage heating command)
- FAN_G_BAS: AV82 or BV06 (Supply fan command)

The below points can be used to set the different temperature SP's for the different unit modes

- STG_1_COOL: AV31 (Y1 command from BAS. The unit controller will control the compressors and/or economizer to achieve and maintain this SP)
- STG_2_COOL: AV33 (Y2 command from BAS. The unit controller will control the compressors and/or economizer to achieve and maintain this SP)
- STG_1_HEAT: AV32 (W1 command from BAS. The unit controller will control the heating stages of gas or electric heat or modulate the HW/Steam valve to achieve and maintain this SP)
- STG_2_HEAT: AV34 (W1 command from BAS. The unit controller will control the heating stages of gas or electric heat or modulate the HW/Steam valve to achieve and maintain this SP)

A unit configured for Constant Volume will not automatically run the supply fan in the Occupied Mode like a VAV or Flexsys configured unit. Under normal CV operation, the supply fan will only run with a Y1, Y2, W1, W2, or G command. Without any of these commands present, the fan will not run. If the control sequence calls for the supply fan to run with the unit in the Occupied Mode, the below Bacnet point will allow this to happen.

- CONTINU_VENT: AV79 or BV03 (With the point turned ON, the supply fan will run whenever the unit is in the Occupied Mode. Turned OFF, the supply fan will only run with a Y1, Y2, W1, W2, or G command. 0=OFF 1=ON)

THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 6 - COMMUNICATING A ZONE TEMPERATURE

The Series 100 with the IPU controller has the ability to accept a communicated zone temperature from a BAS (Building Automation System). This allows the BAS to use their own sensor or take an average reading of all zones and send to the IPU controller.

Whether the BAS will use the communicated zone temp feature for VAV, Flexsys, SZVAV or CV operation, setting the IPU controller to accept the BAS zone temperature will all be the same.

With the rocker switch turned OFF, perform the following steps:

1. Push the Unit Data key, and use the up/down arrows to find the Unit Type screen
2. If Unit Type is set for Constant Volume or SZVAV, proceed to step "c". If Unit Type is set for Variable Air Volume, or Flexsys, the Unit Type will need to be temporarily changed to Constant Volume or SZVAV.
    a. To temporarily change to CV or SZVAV, press the checkmark key, then enter the password, 9725.
    b. Press the checkmark key again, and use the right/left arrows to change Unit Type to Constant Volume, then press checkmark to accept.
3. With Unit Type at Constant Volume or SZVAV, use the down arrow to find the Control Method screen.
4. If Control Method is set to "Comm Zone Temp," proceed to Step 9.
5. If Control Method is not set to "Comm Zone Temp," press the checkmark, and enter the password if necessary, 9725.
6. Using the right/left arrows, change the Control Method type to read "Comm Zone Temp."
7. The unit controller is now set to accept a communicated zone temperature from a BAS.
8. If the Unit Type was VAV or Flexsys, go back to the Unit Type screen and change back to the original value.
9. The BAS can now communicate a Zone Temperature utilizing Bacnet point AV40 (ZONE_TEMP_BAS).

THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 7 - SINGLE ZONE VAV OPERATION

The Series 100 with the IPU controller has the ability to operate as a Single Zone VAV unit. This is only available with units that have the below software versions:

1. 50-61 tons “Rev F”: C.LCR.02.05
2. 70-150 tons “Rev F and G”: C.ECO.01.13

On units with older versions of software, it may be possible to upgrade the software and then configure the unit for Single Zone VAV operation. A supply fan VFD is required for single zone VAV operation.

## WHAT IS SINGLE ZONE VAV?

Single Zone VAV (SZVAV) is typically defined as a ducted HVAC system connected to a rooftop unit with no VAV boxes installed in the duct system. This type of system is typically controlled by one temperature input to the rooftop unit.

On previous versions of the Series 100 units, the only unit types were Constant Volume (CV), Variable Air Volume (VAV), or Flexsys. A CV unit had a single speed supply fan with no way to raise or lower the speed. A VAV- or Flexsys-configured unit had supply fan variable frequency drives (VFDs) installed. The supply fan VFDs were controlled by the duct static pressure setpoint (SP). The VFDs would ramp up/down to maintain the active duct static pressure SP. CV units rely on thermostat commands or a zone temperature input to determine the active mode of operation. VAV or Flexsys units rely on the return air temperature to determine the active mode of operation.

On a Series 100 unit configured for Single Zone VAV, the active mode of operation will be determined by a zone temperature input to the IPU controller, either hardwired or communicated from the BAS. The speed of the supply fan VFD will be controlled as below:

Single Zone VAV Minimum Fan Speed

- This is a user adjustable SP. The range is 33–66%. The factory default is 50%.
- Bacnet Point: SZ_MIN_VFD (AV53)

## MODES OF OPERATION

### Occupied Standby

- Supply fan will run at the SZVAV min speed
- Must be commanded on by FAN_G_BAS (AV82 or BV06) OR Continuous Ventilation is User Enabled. Continuous Ventilation can be enabled at the unit controller or through the BAS.
- CONTINU_VENT (AV79 or BV03)

### Occupied Cooling Low

- Zone temp is between 0.5 and 1.5 °F higher than the zone temperature SP, supply fan at SZVAV min speed
- The unit controller will utilize as many or as few stages of cooling that it needs to achieve and maintain the 1st Stage Cooling SP (STG_1_COOL: AV31)

### Occupied Cooling High

- Zone temp is more than 1.5 °F above zone temperature SP
- The supply fan speed will increase proportionally from the SZVAV min speed SP to 100% fan speed. When the current zone temp is 2.5 °F or more above the zone temp SP, the supply fan will be at 100% fan speed.
- The unit controller will utilize as many or as few stages of cooling that it needs to achieve and maintain the 2nd Stage Cooling SP (STG_2_COOL: AV33)

### Occupied Heating Low

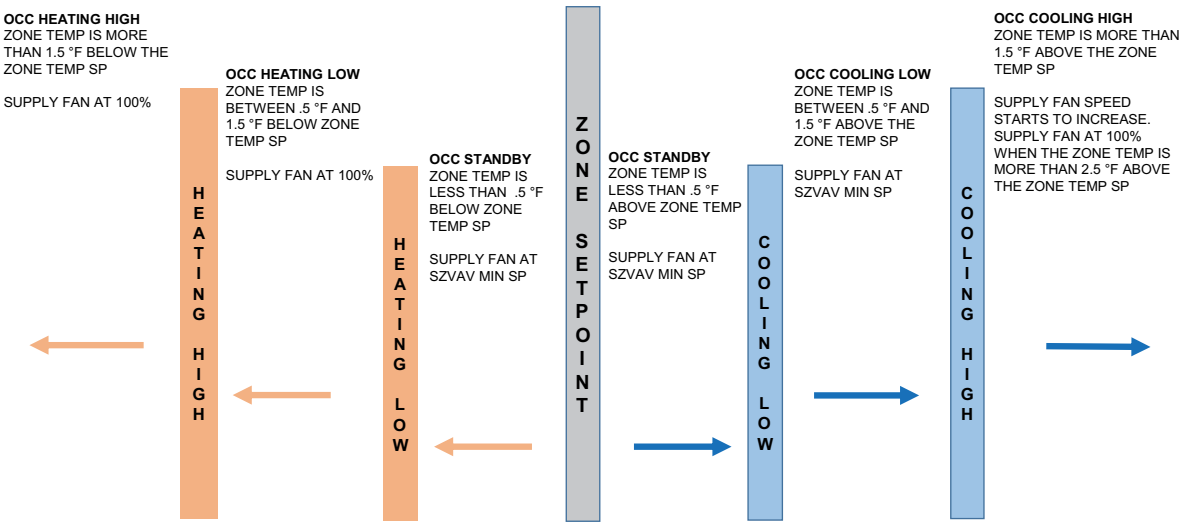
- Supply fan at 100% fan speed
- The unit controller will utilize as many or as few stages of heat that it needs to achieve and maintain the 1st Stage Heating SP (STG_1_HEAT: AV32)

### Occupied Heating High

- Supply fan at 100% fan speed
- The unit controller will utilize as many or as few stages of heat that it needs to achieve and maintain the 2nd Stage Heating SP ( STG_2_HEAT: AV34)

## Other Points

- Occupied Zone Cooling SP (OCC_ZN_COOL: AV21)
- Occupied Zone Heating SP (OCC_ZN_HEAT: AV22)
- Unoccupied Zone Cooling SP (UNOCC_ZN_COOL: AV38)
- Unoccupied Zone Heating SP (UNOCC_ZONE_HEAT: AV39)




NOTES:
1- WHENEVER THE UNIT ENTERS AN ACTIVE COOLING OR HEATING MODE, THE UNIT CONTROLLER WILL UTILIZE AS MANY OR AS FEW STAGES OF COOLING or HEATING THAT IT NEEDS TO ACHIEVE AND MAINTAIN THE ACTIVE SUPPLY AIR TEMP SP.

2- UNOCCUPIED SEQUENCE WILL BE THE SAME AS ABOVE EXCEPT THE ZONE TEMP SPs USED WILL BE THE UNOCC SP's VALUES.

3- UNIT MODES WILL STAGE DOWN WHEN THE ZONE TEMP IS .5 °F UNDER SPs FOR COOLING AND .5 °F OVER SPs FOR HEATING.

**FIGURE 3 -** OPERATIONAL MODE: SINGLE ZONE VAV

# SECTION 8 - SUPPLY AIR TEMPERATURE (SAT) SP RESET

Supply Air Temperature Setpoint Reset is a function that allows the Active Supply Air Temperature SP to be reset to differing values according to certain parameters and programmed algorithms. Programmed SAT reset will only work on Series 100 units set up for VAV operation and is only utilized in the Occupied Cooling mode. SAT reset for other set ups—Constant Volume, Flexsys, and SZVAV—as well as other modes—Occ Heating, Unocc Cooling, and Unocc Heating—will require the BAS to write to those specific points.

There are four different ways to reset the SAT SP for a Series 100 unit.

1. Hardwired Signal: Either from a BAS or a hardwired input to CTB1
2. Return Air Temperature
3. Outside Air Temperature
4. Supply Fan VFD Speed

For reset by return air, outside air, or supply fan VFD speed, SPs are programmed into the unit controller or communicated from a BAS, and the active SAT SP will be determined by the programmed values.

A Hardwired Reset signal is the one most commonly used with a BAS. Before this can work, the "SAT RST BAS" must be enabled thru the Service key at the Unit Controller. Once this is done, the SAT High SP and SAT Low SP can be set.

- SAT High SP: SAT_HIGH_LIM (AV26)
- SAT low SP: SAT_LOW_LIM (AV27)

Once these two values are entered, the BAS can send a command of 0–5 to the following point:

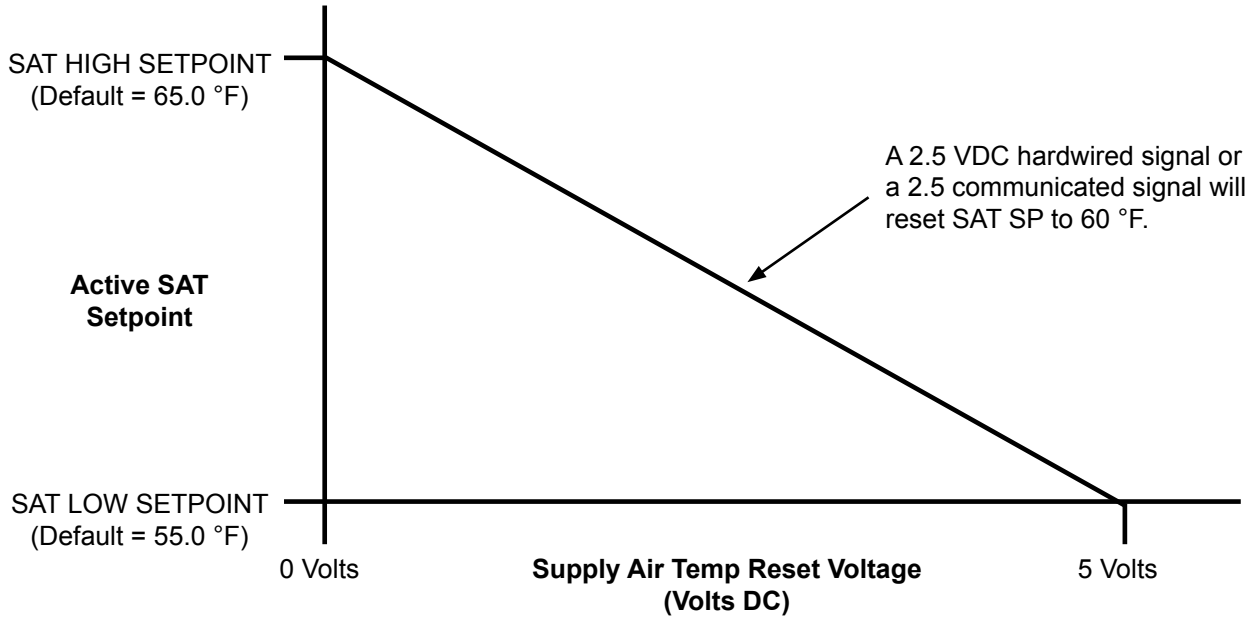
- Supply Air Temp Reset BAS: SAT_RST_BST (AV28)

## SEQUENCE OF OPERATION

BAS Command of "0": The unit controller will set the Active Supply Air Temp SP, ACT_SAT_SP (AI04), to the value programmed at SAT_HIGH_LIM (AV26)

BAS Command of "5": The unit controller will set the Active Supply Air Temp SP, ACT_SAT_SP (AI04), to the value programmed at SAT_LOW_LIM (AV27)

BAS Command between "0–5": The unit controller will set the Active Supply Air Temp SP, ACT_SAT_SP (AI04), to a value somewhere between the SAT High (AV26) and SAT Low (AV27), according to the below chart.



Using the above sequence will allow the BAS to reset the Active SAT SP based on a more varied selection of values than are programmed into the unit controller.

The BAS can also reset the SAT by simply writing to the SAT High (AV26) and SAT Low (AV27) SPs.

### Other Points That Can Be Written to for SAT SP Reset

- Outside Air Temp for High SAT SP: OAT_HIGH_SAT (AV19)
- Outside Air Temp for Low SAT SP: OAT_LOW_SAT (AV20)
- Return Air Temp for High SAT SP: RAT_HIGH_SAT (AV24)
- Return Air Temp for Low SAT SP: RAT_LOW_SAT (AV25)
- Supply Fan Speed for High SAT SP: SF_SPD_H_SAT (AV29)
- Supply Fan Speed for Low SAT SP: SF_SPD_L_SAT (AV30)
- Supply Air Temp SP for Heating: HEATING_SAT (AV09)

### Flexsys

- Evap Leaving Air Temp High SP: EL_AIR_TMP_H (AV07)
- Evap Leaving Air Temp Low SP: EL_AIR_TMP_L (AV08)
- Mixed Supply Air Temp SP: MIXD_SAT_LIM (AV14)
- Supply Air Temp SP for Heating: HEATING_SAT (AV09)

### Constant Volume

- Stage 1 Cooling SP: STG_1_COOL (AV31)
- Stage 2 Cooling SP: STG_2_COOL (AV33)
- Stage 1 Heating SP: STG_1_HEAT (AV32)
- Stage 2 Heating SP: STG_2_HEAT (AV34)

# SECTION 9 - DUCT STATIC PRESSURE RESET (BAS)

Series 100 units have the ability to reset the duct static pressure SP. This can be done in one of two ways, by a 0-5 VDC signal to CTB1 terminals DSP+ and DSP-, or from a 0-5 command from a building automation system.

To reset the duct static pressure SP, the following values must be entered:

- DSP_HI_LIMIT (AV03) Duct Static Pressure High Limit
- DSP_LO_LIMIT (AV04) Duct Static Pressure Low Limit

There is also an option in the unit service menu that must be enabled. That option, “Duct Pres RST BAS” must be enabled for duct static pressure reset from a BAS.

Once the DSP hi and DSP lo values are entered, the BAS will send the 0 or 5 command to the following point:

- DSP_RST_BAS (AV05) Duct Static Pressure Reset BAS

The unit controller will reset the duct static pressure SP according to the BAS command as follows:

- When the BAS command is 0, the unit controller will set the Active DSP SP to the DSP High Limit
- When the BAS command is 5, the unit controller will set the Active DSP SP to the DSP Low Limit
- When the BAS command is somewhere between 0 and 5, the unit controller will reset the Active DSP SP to a percentage down from the DSP Hi Limit based on a percent of the difference between the DSP Hi and the DSP Lo

Example:

- DSP_HI_LIMIT (AV03): 2.00” wc
- DSP_LO_LIMIT (AV04): 1.00” wc

A command of 0, Active DSP SP=2.00” wc

A command of 1.25, Active DSP=1.75” wc

A command of 2.5, Active DSP SP= 1.50” wc

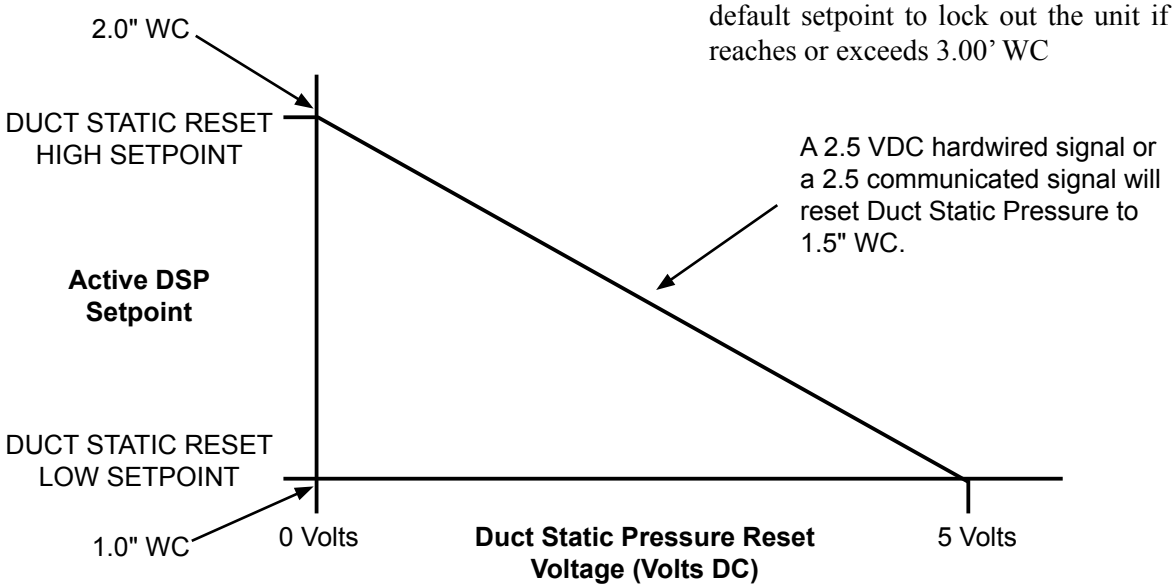
A command of 3.75, Active DSP=1.25” wc

A command of 5, Active DSP=1.00”wc.

The percent of reset can be read at point DCT_ST_PR_RT (AI16) Duct Static Press Reset

The actual Duct Static Pressure can be read at point DCT_STAT_PRS (AI17) Actual Duct Static Pressure

The Active DSP SP can also be reset by simply writing to the DSP_HI_LIMIT (AV03) point whenever a duct static SP change is required. If this is the option chosen, just remember that the DSP_HI_LIMIT (AV03) cannot be lower than the DSP_LO_LIMIT (AV04). The best way to do this is set the DSP_LO_LIMIT (AV04) to 0.00 “ wc and then the DSP_HI_LIMIT (AV03) will have a range of 0.00” wc to the max of the duct static transducer range, typically 5.00” wc. There is a factory default setpoint to lock out the unit if the duct static reaches or exceeds 3.00’ WC



THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 10 - MORNING WARM-UP

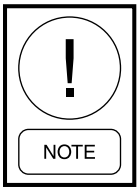
Morning Warm-Up is a control sequence that allows a unit to start the heat source and then heat the entire building at the same time until a comfortable temperature is reached. It is typically performed before the building goes into an Occupied mode.

Before starting a morning warm-up sequence, it is highly recommended to open all VAV or Flexsys underfloor boxes to their max position.

On a Series 100 unit, the unit must be in an Unoccupied mode before Morning Warm-Up can be initiated. Morn Warm-Up is a function of the unocc mode.

There are 3 ways to initiate a morn warm-up sequence:

1. Hardwired digital signal to the W1 input (Typically for units set up for Constant Volume)
2. Self initiated thru the “Adaptive Morn Warm-Up Active” mode
3. Receiving a command from a BAS




***On points that have an AV and BV number, changing the one will also change the other.***

Morning Warm-Up must be enabled. This is either done at the unit controller or can be done thru the BAS. MORN_WARM_UP (AV85 or BV9) 0=Disabled 1=Enabled.

Set the Morning Warm-Up Temp SP. (This is the same as the Heating Return Air Temp SP) MORN_WUP_RAT (AV15). (This value is limited by the RAT_COOL_SP (AV23)). The two values can be no closer than 2 °F, so if the RAT_COOL_SP is 70 °F, the MORN_WUP_RAT cannot go higher than 68 °F without first raising the RAT_COOL_SP).

Set the supply air temp SP: HEATING_SAT (AV09).

## MORNING WARM-UP SEQUENCE

1. With the unit in an Unocc mode, send a command to start the Morn Warm-Up sequence. MORN_WUP_CMD (AV86 or BV10).
2. The S100 unit will enter the Morn Warm-Up mode and start the Supply Fan. The Supply Fan VFD will control to duct static SP if unit is VAV or Flexsys. Supply Fan will run at full speed, 100% for CV and SZVAV configured units.
3. After running the fan for 5 minutes, the unit controller will compare the current Return Air Temp, RET_AIR_TEMP (AI40), to the RAT Heating SP, MORN_WUP_RAT (AV85 or BV9).
4. If the current RAT (AI40) is greater than the RAT Heating SP (AV85 or BV9) minus 1 °F, the heat will not be energized.
5. If the current RAT (AI40) is less than or equal to the RAT Heating SP (AV15) minus 1 °F, the heat will be energized.
6. The heating medium will use as much or as little of its capacity as needed to achieve the Heating SAT SP (AV09).
7. The heat will stay energized until the RAT (AI40) is greater than or equal to RAT Heating SP (AV15) plus 0.5 °F.
8. The Series 100 unit will stay in the Morn Warm-Up mode until the command is removed, or the unit enters an Occupied mode

THIS PAGE INTENTIONALLY LEFT BLANK.

# SECTION 11 - SERIES 100: FLEXSYS OPERATION

The following sections deal with the operation of a Series 100 unit configured for Flexsys operation. Flexsys operation is the use of an underfloor plenum to provide conditioned air to a building. Since the conditioned air is delivered up from the floor, the operation differs from that of a typical VAV system. Please review these sections thoroughly before proceeding with unit set-up, start-up, and operation.

The design of a Flexsys system is very critical to the proper operation of the Series 100 unit. Please review the following areas that create issues with the proper operation of a Flexsys system/unit.

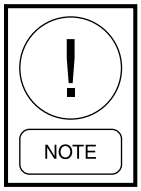
1. Plenum Integrity: “If you make a hole, seal a hole.” The underfloor plenum must be completely sealed from air leaking out.
2. Open plenum returns: It is highly recommended that returns be ducted to every room. This allows the warmer return air to properly mix and be at the proper temperature returning to the unit.
3. Six foot cooling zone: When designing a Flexsys system, only the first 6 feet from the floor up is to be conditioned. Above 6 feet, the air needs to be mixed with heat loads. This will ensure that the R/A is at least 78.0 °F. It is has been determined that RATs cooler than 78.0 °F cannot properly raise the temperature of the air leaving the evap coil to the recommended Mixed SAT (MX SAT) of 62.0–64.0 °F. It has been determined than MX SAT’s lower than 62.0 °F are uncomfortable to occupants of a space.
4. Multiple Plenums/One Unit: When designing a system that will serve multiple plenums, it is highly recommended that each plenum have its own volume damper controlled by an actuator. Each plenum should also have its own pressure transducer that controls the actuator driven volume damper. Each plenum should be maintained at 0.05 ”WC.

The above issues should have been taken into consideration during the design and engineering phase of the project.

Since a Flexsys unit delivers air through an underfloor plenum, some of the SPs differ from a typical VAV unit. Below are recommended SP’s provided by the engineering team. There has been a lot of testing and research done on these systems to arrive at these SPs. Please be advised that these are recommendations only, and job specific SPs could be different. We recommend using these SPs at least as a starting point.

**Factory Recommended Setpoints:**

- RAT Cooling SP: 78.0 °F
- MX SAT SP: 62.0–64.0 °F (see note)
- Evap Leaving Air Temp High SP: 58.0 °F
- Evap Leaving Air Temp Low SP: 55.0 °F
- Duct Static SP: 0.05 ”WC
- Heating SAT SP: 80.0 °F
- Max Bypass: 40%




***On a Flexsys unit, the MX SAT is the temperature of the supply air off the evaporator coil mixed with the warmer return air that is bypassed around the evaporator coil. The bypassed return air is introduced directly under the supply air fan.***

## FLEXSYS: CURRENT OPERATING MODE (OCCUPIED)

The current operating mode for a Flexsys configured unit will be decided the same as for a VAV configured unit by the Return Air temperature (RAT).

- If the RAT is ≥ the Cooling RAT SP by 0.5 °F, the unit will enter the Cooling mode.
- If the RAT ≤ the Heating RAT SP by 0.5 °F, the unit will enter the Heating mode.
- If the RAT is between the Cooling RAT SP and the Heating RAT SP, the unit will remain in the Standby mode.

## FLEXSYS: FAN OPERATION

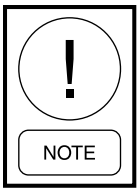
The same as a VAV configured unit, the supply fan will be controlled by a VFD. The VFD will control the speed of the supply fan up/down to achieve and maintain the Active Duct Static SP.

The same as a VAV configured unit, the supply fan will be on whenever the unit is in the Occupied Mode and will cycle on/off in the Unoccupied Mode with a demand for heating or cooling.

## FLEXSYS: COOLING

### Occupied

Whenever a Flexsys unit enters an Occ Cooling mode, it will always start in the Occ Cooling w/o Bypass mode for the first 30 seconds. After this time delay has expired, the unit controller will determine which mode it needs to be in: Occ Cooling w/o Bypass or Occ Cooling w/ Bypass.




***The programmable option, SAT RESET, is not utilized on Flexsys configured units. If the need arises to reset the MX SAT SP on a Flexsys configured unit, it will need to be done through the BAS.***

#### *Occ Cooling w/o Bypass*

The unit controller will cycle the compressors or modulate the economizer to achieve and maintain the MX SAT SP.

- If the economizer is active, the unit will remain in the Occ Cooling w/o Bypass mode

  **OR**

- If the RAT ≥ RAT SP plus 0.5 °F **BUT** RAT < MX SAT SP + the RA Diff SP (user adjustable between 2.0–10.0 °F)

#### *Occ Cooling w/ Bypass*

If the RAT ≥ RAT SP plus 0.5 °F **AND** RAT > MX SAT SP + the RA Diff SP (user adjustable between 2.0–10.0 °F).

The unit controller will cycle the compressors to maintain either the Evap Leaving Air Temp High SP or the Evap Leaving Air Temp Low SP.

The unit controller will modulate the Flexsys Bypass Damper open/closed to achieve and maintain the MX SAT SP.

#### *Evap Leaving Air Temp High SP*

- R/A Humidity sensor is not reliable

  **OR**

- R/A Enthalpy < the Reset Enthalpy SP

#### *Evap Leaving Air Temp Low SP*

- R/A Enthalpy is ≥ Reset Enthalpy SP

  **OR**

- Underfloor Slab Dewpoint is ≥ Underfloor Slab Temp – 2.0 °F for 120 seconds (Only if Dew Point Reset is User Enabled)

#### *Return Air Bypass*

**Current %:** This is the amount of air the unit controller believes it is bypassing due to the fact that the MX SAT is not increasing. The unit controller utilizes the current RAT, the Current Evap Leaving Air Temp, and the MX SAT to perform a calculation to arrive at the Current %.

**Active SP %:** This is how much of the return air the unit controller believes it needs to bypass to warm the MX SAT from its current value to the MX SAT SP. The unit controller utilizes the current RAT, the current Evap Leaving Air Temp, and the current MX SAT to perform a calculation to arrive at the Active SP %.

Both of the above numbers are based on internal algorithms and logic built into the unit controller. The algorithms and internal logic are not user adjustable.

#### *Bypass Damper Position*

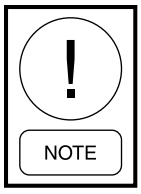
This is the actual position of the bypass damper. The bypass damper should be able to drive between 0% and 40%.

#### *Bypass Damper Operation*

The operation of the bypass damper is very slow and the logic that drives the damper is quite complicated. When the unit is in normal operation, it could take up to 30 mins for the bypass damper to go from 0% to 40%. If the unit is operating properly and the temperatures are in the proper range, the damper will probably never drive to 40%.

#### *Max Bypass*

This is the maximum amount of return air that the unit controller will allow to bypass around the evaporator coil through the Flexsys Bypass Damper. The unit controller will utilize internal logic and calculations to determine how much of the return air is being bypassed. This is not the same as the actual bypass damper position. This is an adjustable SP with a range of 20%–40%. We recommend leaving it at 40% for initial start-up and then adjusting down later if need be.




***It is very likely that the above mentioned parameters, RETURN AIR BYPASS CURRENT %, RETURN AIR BYPASS ACTIVE SP %, and BYPASS DAMPER POSITION % will not have matching values. This is normal, do not be alarmed.***

### Unoccupied

Unoccupied Cooling mode will be initiated by the current zone temp being higher than the Unoccupied Zone Cooling SP by 0.5 °F. The Night Set Back feature must be User Enabled. Night Set Back can be found under the Heating menu.

- Supply fan starts. Supply fan VFD is controlled to the Active Duct Static SP
- Economizer is modulated open/closed to achieve and maintain the MX SAT SP

  **AND/OR**

- Compressors are cycled on/off to achieve and maintain the MX SAT SP
- Bypass damper remains closed
- Cooling operation will continue until the current zone temp is less than the Unocc Zone Cooling SP by 0.5 °F

## FLEXSYS: COMPRESSOR CONTROL

### Occupied Cooling w/o Bypass

- S100 enters an active cooling mode.
- Unit Controller sets the "Cooling Control Offset" to 2.0 °F.
- Unit Controller compares the current MX SAT to the MX SAT SP ± the "Cooling Control Offset."
- If MX SAT is > the MX SAT SP + the "Cooling Control Offset," the Unit Controller will:

  c. Start a Compressor

  **OR**

  d. Bring on a additional stage of cooling based on the "Next Stage to Enable"

- If MX SAT is < the MX SAT SP – the "Cooling Control Offset," the Unit Controller will:
  - Stop a compressor based on the "Next Stage to Disable"

### Occupied Cooling w/ Bypass

- S100 unit enters an active cooling mode.
- Unit Controller sets the "Cooling Control Offset" to 2.0 °F.
- Unit Controller compares the Evap Leaving Air Temp to the Active Evap Leaving Air Temp SP ± the "Cooling Control Offset."
- If Evap Leaving Air Temp is > the Active Leaving Air Temp SP + the "Cooling Control Offset," the Unit Controller will:

  a. Start a compressor

  **OR**

  b. Bring On and additional stage of cooling based on the "Next Stage to Enable"

- If the Evap Leaving Air Temp is < the Active Evap Leaving Air Temp SP, the Unit Controller will:
  - Stop a compressor based on the "Next Stage to Disable"

## FLEXSYS: HEATING

Occupied/Unoccupied heating operation will follow the same sequence as a VAV configured unit. It is recommended to limit the Heating SAT SP to 80.0 or 90.0 °F. This will prevent the underfloor concrete slab from becoming too warm and then radiating heat for an extended period of time after heating operation has been terminated.

## FLEXSYS: UNDERFLOOR TEMPERATURE CONTROL

### Dew Point Reset

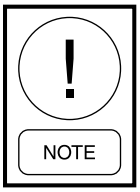
This sequence changes the Active Evaporator Leaving Air Temperature to a lower value when the temperature of the underfloor air approaches its dew point.

- **MUST** have an underfloor slab temperature sensor **AND** an underfloor humidity sensor installed. (Field provided and field wired to CTB1. Can also be communicated from the BAS.)
- Dew Point Reset **MUST** be User Enabled.
- Unit controller uses the MX SAT and the underfloor humidity to calculate the underfloor dew point.
- If Underfloor Air Dew Point ≥ the Underfloor Slab Temp – 2.0 °F for 120 seconds, the unit controller will switch from the Evap Leaving Air Temp High SP to the Evap Leaving Air Temp Low SP.
- Unit controller will continue to use the Evap Leaving Air Temp Low SP until the Underfloor Air Dew Point < the Underfloor Slab Temp – 2.5 °F.

### Active Slab Control

This sequence allows heat to be turned ON during a transition from one occupancy state to another if the underfloor air temperature is higher than the undefloor slab temp.

- Unit **MUST** have heat installed.
- Heating System **MUST** be User Enabled.
- Active Slab Control **MUST** be User Enabled.
- **MUST** have an underfloor slab temperature sensor installed. (Field provided and field wired to CTB1. Can also be communicated from the BAS.)




***The unit display shows the Heating System Status as Inactive while in Active Slab Control. The Supply System Status shows as Active.***

#### *Unoccupied to Occupied*

- Unit controller checks the Underfloor Slab Temp immediately after switching from Unoccupied to Occupied Standby (if the unit controller calls from Occupied Cooling with or without Bypass during this time, Active Slab Control will be terminated).
- If Underfloor Slab Temp ≤ the MX SAT SP – 2.0 °F, the Underfloor Temp Override will become Active.
- Underfloor Temp Control is set to MX SAT SP + 10.0 °F.
- Unit Controller will generate a call for heat
  a. If staged heat (staged gas or electric), unit controller will start the first stage of heat
  b. If modulating heat (modulating gas or hot water/steam), unit controller will control the SAT to the Underfloor Temp Control SP
- Heating operation will continue until
  a. The Underfloor Slab Temp ≥ the MX SAT SP

  **OR**

  b. 20 minutes time has elapsed

#### *Occupied to Unoccupied Mode*

- Unit controller checks the Underfloor Slab Temp immediately after switching from an Occupied mode to Unoccupied Standby.
- If the Underfloor Slab Temp > the RAT – 2.0 °F, Underfloor Temp Override will become Active.
- The Underfloor Temp Control SP is set to the RAT SP + 10.0 °F.
- Unit Controller will generate a call for heat
  a. If staged heat (staged gas or electric), unit controller will start the first stage of heat
  b. If modulating heat (modulating gas or hot water/steam), unit controller will control the SAT to the Underfloor Temp Control SP
- Heating operation will continue until
  a. The Underfloor Slab Temp > RAT + 1.0 °F

  **OR**

  b. 20 minutes time has elapsed

## FLEXSYS: ALL OTHER SEQUENCES

The other sequences of operation for a Flexsys unit will follow the same procedures as a VAV configured unit.

## FLEXSYS: BACNET POINTS

See *Table 2 on page 49*.

# SECTION 12 - BACNET MS/TP POINTS

**TABLE 1 -** BACNET MS/TP POINTS

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| ACT_DSP_SP | DUCT STATIC PRESS ACTIVE SP | R | AI01 | 514 | DISPLAYS THE ACTIVE DUCT STATIC PRESS SP ("W.C.) |
| ACT_MIN_FLOW | ACTIVE MINIMUM AIRFLOW | R | AI02 | 515 | DISPLAYS THE MIN VENTILATION AIR (CFM) SP WHEN THE UNIT HAS AN AIR FLOW MONITORING STATION |
| ACT_MIN_POS | ACTIVE MINIMUM POSITION | R | AI03 | 516 | DISPLAYS THE MIN OA DAMPER POSITION (%) WHEN THE UNIT IS FIXED MIN VENT CONTROL |
| ACT_SAT_SP | ACTIVE SUPPLY AIR TEMP SP | R | AI04 | 517 | **CV** or **VAV:** DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP<br>**FLEXSYS:** IF CURRENT MODE IS OCC COOLING W/O BYPASS, THIS WILL BE = TO THE MX SAT SP (*MIXD_SAT_LIM; AV14*). IF CURRENT MODE IS OCC COOLING W/ BYPASS, THIS WILL BE = TO EITHER THE EVAP LEAVING HIGH SP (*EL_AIR_ TMP_H; AV07*) OR THE EVAP LEAVING LOW SP (*EL_AIR_ TMP_I; AV08*) DEPENDING ON THE SYSTEM CONDITIONS |
| ACT_SLAB_CTL | ACTIVE SLAB CONTROL (FLEXSYS ONLY) | R/W | AV77 BV01 | 1102 | ALLOWS THE ACTIVE SLAB CONTROL TO BE TURNED ON/ OFF 0=OFF 1=ON |
| AMORN_WA_ACT | ADAPTIVE MORNING WARMUP STATUS **(ONLY USED WITH INTERNAL TIME CLOCK)** | R | BI01 | | DISPLAYS THE STATUS OF THE ADAPTIVE MORNING WARM-UP |
| BLD_STAT_PRS | BUILDING PRESSURE CURRENT | R | AI05 | 518 | DISPLAYS THE CURRENT BUILDING PRESS ("W.C.) |
| BULD_PRES_SP | BLDG PRESS SP | R/W | AV01 | 1026 | DISPLAYS THE ACTIVE BUILDING PRESSURE SP ("W.C.) |
| BYPASS_ DAMPER | BYPASS DAMPER POSITION **(FLEXSYS ONLY)** | R | AI06 | 519 | DISPLAYS THE ACTUAL BYPASS DAMPER POSITION (%) |
| CO2_1_OUT | CO2 LEVEL OF THE OUTSIDE AIR | R | AI07 | 520 | DISPLAYS THE ACTUAL OA AIR CO2 (PPM) |
| CO2_2_IN | CO2 LEVEL OF THE INSIDE AIR | R | AI08 | 521 | DISPLAYS THE ACTUAL RA AIR CO2 (PPM) |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| CO2_INSIDE | CO2 LVL INSIDE VALUE BAS | R/W | AV43 | 1168 | A BAS ENTERED VALUE FOR THE INSIDE CO2 LEVEL. "CO2 LVL INSIDE BAS" MUST BE ENABLED USING THE SERVICE KEY IN ORDER TO USE THIS POINT (CO2) |
| CO2_OFFSET | CO2 OFFSET SP | R/W | AV02 | 1027 | DISPLAYS THE VALUE (PPM) THAT THE INDOOR CO2 MUST RISE ABOVE THE OUTSIDE CO2 TO ACTIVATE DEMAND VENTILATION |
| COL/HEAT_FLT | COOLING/ HEATING FAULT STATUS | R | BI02 | 1283 | DISPLAYS THE STATUS OF THE COOLING OR HEATING SYSTEM. 0=NO FAULT 1=FAULT |
| COMFORT_VENT | COMFORT VENTILATION **(CONSTANT VOLUME)** | R/W | AV78 BV02 | 1103 | DISPLAYS THE STATUS OF THE COMFORT VENT OPTION AND ALLOW IT TO BE TURNED ON/ OFF: 0=OFF 1=ON |
| COMP_1A | COMPRESSOR 1A STATUS | R | BI03 | 1284 | DISPLAYS THE STATUS OF COMP 1A: 0=OFF 1=ON |
| COMP_1A_OPER | COMP 1A OPERATING HRS | R | AI09 | 522 | DISPLAYS THE OPERATING HRS OF COMP 1A |
| COMP_1B | COMPRESSOR 1B STATUS | R | BI04 | 1285 | DISPLAYS THE STATUS OF COMP 1B: 0=OFF 1-ON |
| COMP_1B_OPER | COMP 1B OPERATING HRS | R | AI10 | 523 | DISPLAYS THE OPERATING HRS OF COMP 1B |
| COMP_2A | COMPRESSOR 2A STATUS | R | BI05 | 1286 | DISPLAYS THE STATUS OF COMP 2A: 0=OFF 1=ON |
| COMP_2A_OPER | COMP 2A OPERATING HRS | R | AI11 | 524 | DISPLAYS THE OPERATING HRS OF COMP 2A |
| COMP_2B | COMPRESSOR 2B STATUS | R | BI06 | 1287 | DISPLAYS THE STATUS OF COMP 2B: 0=OFF 1=ON |
| COMP_2B_OPER | COMP 2B OPERATING HRS | R | AI12 | 525 | DISPLAYS THE OPERATING HRS OF COMP 2B |
| COMP_3A | COMPRESSOR 3A STATUS **(70-150 TON ONLY)** | R | BI07 | 1288 | DISPLAYS THE STATUS OF COMP 3A: 0=OFF 1=ON |
| COMP_3A_OPER | COMP 3A OPERATING HRS **(70-150 TON ONLY)** | R | AI13 | 526 | DISPLAYS THE OPERATING HRS OF COMP 3A |
| COMP_3B | COMPRESSOR 3B STATUS **(70-150 TON ONLY)** | R | BI08 | 1289 | DISPLAYS THE STATUS OF COMP 3B: 0=OFF 1=ON |
| COMP_3B_OPER | COMP 3B OPERATING HRS **(70-150 TON ONLY)** | R | AI14 | 527 | DISPLAYS THE OPERATING HRS OF COMP 3B |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| COMP_LPCO_1 | SAFETY INPUT LPCO CKT 1 STATUS | R | BI09 | 1290 | DISPLAYS THE STATUS OF THE LOW PRESS SWITCH ON CKT 1: 0=FAULT 1=NO FAULT |
| COMP_LPCO_2 | SAFETY INPUT LPCO CKT 2 STATUS | R | BI10 | 1291 | DISPLAYS THE STATUS OF THE LOW PRESS SWITCH ON CKT 2: 0=FAULT 1=NO FAULT |
| COMP_LPCO_3 | SAFETY INPUT LPCO CKT 3 STATUS **(70-150 TON ONLY)** | R | BI11 | 1292 | DISPLAYS THE STATUS OF THE LOW PRESS SWITCH ON CKT 3: 0=FAULT 1=NO FAULT |
| COMP_STAT_1 | SAFETY CHAIN CKT 1 STATUS | R | BI12 | 1293 | DISPLAYS THE STATUS OF CKT 1 SAFETY CHAIN: 0=FAULT 1=NO FAULT |
| COMP_STAT_2 | SAFETY CHAIN CKT 2 STATUS | R | BI13 | 1294 | DISPLAYS THE STATUS OF CKT 2 SAFETY CHAIN: 0=FAULT 1=NO FAULT |
| COMP_STAT_3 | SAFETY CHAIN CKT 3 STATUS **(70-150 TON ONLY)** | R | BI14 | 1295 | DISPLAYS THE STATUS OF CKT 3 SAFETY CHAIN: 0=FAULT 1=NO FAULT |
| COND_FAN_1A | COND FAN 1A/1 STATUS | R | BI15 | 1296 | DISPLAYS THE STATUS OF COND FAN 1A/1: 0=OFF 1=ON |
| COND_FAN_1B | COND FAN 1B/2 STATUS | R | BI16 | 1297 | DISPLAYS THE STATUS OF COND FAN 1B/2: 0=OFF 1=ON |
| COND_FAN_2A | COND FAN 2A/3 STATUS | R | BI17 | 1298 | DISPLAYS THE STATUS OF COND FAN 2A/3: 0=OFF 1=ON |
| COND_FAN_2B | COND FAN 2B/4 STATUS | R | BI18 | 1299 | DISPLAYS THE STATUS OF COND FAN 2B/4: 0=OFF 1=ON |
| COND_FAN_3A | COND FAN 3A/5 STATUS **(70-150 TON ONLY)** | R | BI19 | 1300 | DISPLAYS THE STATUS OF COND FAN 3A/5: 0=OFF 1=ON |
| COND_FAN_3B | COND FAN 3B/6 STATUS **(70-150 TON ONLY)** | R | BI20 | 1301 | DISPLAYS THE STATUS OF COND FAN 3B/6: 0=OFF 1=ON |
| COND_FAN_SPD | COND FAN SPEED | R | AI15 | 528 | NOT USED AT THIS TIME. FOR FUTURE USE |
| CONTINU_VENT | CONTINUOUS VENTILATION **(CONSTANT VOLUME)** | R/W | AV79 BV03 | 1104 | DISPLAYS THE STATUS OF THE CONTINUOUS VENTILATION OPTION AND ALLOWS FOR IT TO BE TURNED ON/OFF: 0=OFF 1=ON |
| DCT_ST_PR_RT | DUCT STATIC PRESS RESET | R | AI16 | 529 | DISPLAYS THE STATUS OF THE HARDWIRED DUCT STATIC RESET VALUE TO CTB1 (%) |
| DCT_STAT_PRS | DUCT STATIC PRESS CURRENT **(VAV or FLEXSYS)** | R | AI17 | 530 | DISPLAYS THE ACTUAL DUCT STATIC PRESS ("WC) |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| DEW_PNT_RST | DEW POINT RESET **(FLEXSYS)** | R/W | AV80 BV04 | 1105 | ALLOWS THE DEW POINT RESET FEATURE TO BE TURNED ON/OFF: 0=OFF 1=ON |
| DSP_HI_LIMIT | DUCT STATIC RESET HIGH SP **(VAV or FLEXSYS)** | R/W | AV03 | 1028 | DISPLAYS THE DUCT STATIC HIGH SP ("W.C.) |
| DSP_LO_LIMIT | DUCT STATIC RESET LOW SP **(VAV or FLEXSYS)** | R/W | AV04 | 1029 | DISPLAYS THE DUCT STATIC LOW SP ("W.C.) |
| DSP_RST_BAS | DUCT STATIC PRESS RESET BAS **(VAV or FLEXSYS)** | R/W | AV05 | 1030 | A BAS VALUE THAT CAUSES THE RESET OF THE DUCT STATIC PRESS SP BETWEEN TO HIGH AND LOW VALUES. "DUCT PRES RST BAS" MUST BE ENABLED THRU THE SERVICE KEY TO USE THIS POINT (%) |
| ECON_ME_USED | ECON METHOD ACTIVE | R | AI18 | 531 | DISPLAYS THE STATUS OF THE ACTIVE ECONOMIZER MODE: 1=DRY BULB 2=SINGLE ENTHALPY 3=DUAL ENTHALPY 4=BEST METHOD AVAIL |
| ECON_STATUS | ECON SYSTEM STATUS | R | AI19 | 532 | DISPLAYS THE STATUS OF THE ECONOMIZER: 1=INSTALLED AND ACTIVE 2=NOT INSTALLED 3=DISABLED |
| ECONO_INSTAL | ECONOMIZER SYSTEM | R/W | AV81 BV05 | 1106 | ALLOWS THE ECONOMIZER FEATURE TO BE TURNED ON/ OFF: 0=OFF 1=ON |
| ECONO_ METHOD | ECON METHOD TO USE | R/W | AV06 | 1031 | ALLOWS FOR THE SELECTION OF THE ECONOMIZER METHOD TO USE: 1=DRY BULB 2=SINGLE ENTHALPY 3=DUAL ENTHALPY 4=BEST METHOD AVAIL |
| EL_AIR_TMP_H | EVAP LEAVING AIR TEMP HIGH SP **(FLEXSYS)** | R/W | AV07 | 1032 | DISPLAYS THE ACTIVE SP FOR THE HIGH EVAP LEAVING AIR TEMP. THIS IS THE SP THE COMPRESSORS ARE CONTROLLED TO **(OCC COOLING W/ BYPASS)** |
| EL_AIR_TMP_L | EVAP LEAVING AIR TEMP LOW SP **(FLEXSYS)** | R/W | AV08 | 1033 | DISPLAYS THE ACTIVE SP FOR THE LOW EVAP LEAVING AIR TEMP. THIS IS THE SP THE COMPRESSORS ARE CONTROLLED TO **(OCC COOLING W/ BYPASS)** |
| EVAP_AIR_TMP | FLEXSYS EVAP TEMP CURRENT **(FLEXSYS)** | R | AI20 | 533 | DISPLAYS THE ACTUAL TEMP OF THE AIR LEAVING THE EVAPORATOR **(OCC COOLING W/ BYPASS)** |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| EXH_CTRL_BAS | EXHAUST FAN CONTROL | R/W | BV24 | NA* | WHEN ENABLED, ALLOWS THE BAS TO CONTROL THE EXHAUST FAN SPEED. CAN BE ENABLED THRU THE BAS OR AT THE UNIT CONTROLLER IN THE SERVICE MENU |
| EXH_DMPR/VFD | EXHAUST FAN SPEED | R/W | AV52 | NA* | THIS IS THE SPEED THE EXHAUST FAN WILL OPERATE AT WHEN EXH_CTRL_BAS IS "USER ENABLED" |
| EXH_FAN_STAT | EXHAUST FAN STATUS | R | BI21 | 1302 | DISPLAYS THE STATUS OF THE EXHAUST FAN PROVING CIRCUIT: 0=OPEN 1=CLOSED |
| EXHAUST_FAN | EXHAUST FAN OUTPUT STATUS | R | BI22 | 1303 | DISPLAYS THE STATUS OF THE EXHAUST FAN OUTPUT: 0=OFF 1=ON |
| EXHAUST_OUT | EXHAUST DAMPER POSITION | R | AI21 | 534 | DISPLAYS THE CONTROL OUTPUT TO THE EXH DAMPER (%) |
| FAN_FAULT | FAN FAULT STATUS | R | BI23 | 1304 | DISPLAYS THE STATUS OF THE SUPPLY, EXHAUST, or RETURN FAN FAULT: 0=NO FAULT 1=FAULT |
| FAN_G | FAN (G) STATUS | R | BI24 | 1305 | DISPLAYS THE STATUS OF THE FAN (G) INPUT; EITHER HARDWIRED (CTB1) or COMMUNICATED (BAS): 0=OFF 1=ON |
| FAN_G_BAS | FAN (G) BAS | R/W | AV82 BV06 | 1107 | A BAS COMMAND THAT ALLOWS THE FAN (G) INPUT TO BE TURNED ON/OFF: 0=OFF 1=ON |
| FILTER_STATS | FILTER STATUS | R | BI25 | 1306 | DISPLAYS THE STATUS OF THE DIRTY FILTER INPUT: 0=NO FAULT 1=FAULT |
| FURN_OUT_1 | ELECT HEAT STAGE 1 STATUS STAGED GAS FURN 1 LO STATUS MOD GAS FURN 1A LOW STATUS | R | BI26 | 1307 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |
| FURN_OUT_2 | ELECT HEAT STAGE 2 STATUS STAGED GAS FURN 1 HIGH STATUS MOD GAS FURN 1A HIGH STATUS | R | BI27 | 1308 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| FURN_OUT_3 | ELECT HEAT STAGE 3 STATUS STAGED GAS FURN 2 LOW STATUS MOD GAS FURN 2 LOW STATUS | R | BI28 | 1309 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |
| FURN_OUT_4 | ELECT HEAT STAGE 4 STATUS STAGED GAS FURN 2 HIGH STATUS MOD GAS FURN 2 HIGH STATUS | R | BI29 | 1310 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |
| FURN_OUT_5 | ELECT HEAT STAGE 5 STATUS STAGED GAS FURN 3 LOW STATUS MOD GAS FURN 3 LOW STATUS | R | BI30 | 1311 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |
| FURN_OUT_6 | ELECT HEAT STAGE 6 STATUS STAGED GAS FURN 3 HIGH STATUS MOD GAS FURN 3 HIGH STATUS | R | BI31 | 1312 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |
| FURN_OUT_7 | ELECT HEAT STAGE 7 STATUS MOD GAS FURN 1B STATUS | R | BI32 | 1313 | DISPLAYS THE STATUS OF THE CONTROL OUTPUT TO THE INDICATED HEAT SECTION: 0=OFF 1=ON |
| HEAT_ENABLE | HEATING SYSTEM | R/W | AV83 BV07 | 1108 | A BAS COMMAND THAT ALLOWS THE HEATING FUNCTION TO BE TURNED ON/OFF: 0=ENABLED 1=DISABLED |
| HEAT_ENT_TEMP | HEAT ENTERING TEMP | R | AI22 | 535 | DISPLAYS THE ACTUAL TEMP OF THE AIR ENTERING THE ELECT, STAGED GAS, OR MOD GAS HEAT SECTIONS |
| HEAT_STAGES | ELECTRIC HEAT STAGES or GAS HEAT STAGES | R | AI23 | 536 | DISPLAYS THE NUMBER OF ELECT OR STAGED GAS HEAT STAGES AVAILABLE |
| HEAT_VACTION | HW VALVE ACTION | R/W | AV84 BV08 | 1109 | A BAS COMMAND THAT ALLOWS THE HOT WATER/STEAM VALVE ACTION TO BE CHANGED: 0=DIRECT 1=REVERSE |
| HEATING_SAT | HEATING SUPPY SIR TEMP SP **(VAV or FLEXSYS)** | R/W | AV09 | 1034 | DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP FOR HEATING |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| HEATING_VLV | HEATING VALVE | R | AI24 | 537 | DISPLAYS THE OUPUT FROM THE CONTROL TO A HW/STEAM VALVE or MOD GAS HEAT VALVE (%) |
| HW_FRZ_STAT | HW/STEAM COIL FREEZESTAT STATUS | R | BI33 | 1314 | DISPLAYS THE STATUS OF THE FREEZESTAT ON UNITS WITH HW/STEAM HEAT: 0=NO FAULT 1=FAULTED |
| LOCAL_STOP | LOCAL STOP STATUS | R | BI34 | 1315 | DISPLAYS THE STATUS OF THE 24VAC INPUT TO THE CONTROL BOARD THRU THE SD TERMINAL AND/OR THE UNIT ON/OFF SWITCH |
| MAX_BYPASS | MAXIMUM BYPASS SP **(FLEXSYS)** | R/W | AV10 | 1035 | DISPLAYS THE MAX SETTING FOR THE BYPASS DAMPER |
| MAX_FLOW_DV | OUTSIDE AIR MAX FLOW SP | R/W | AV11 | 1036 | DISPLAYS THE MAX AIRFLOW FOR DEMAND VENTILATION WITH AN AIRFLOW STATION (CFM) |
| MECH_LCK_TMP | MECH COOLING LOCKOUT SP | R/W | AV12 | 1037 | DISPLAYS THE MIN OA TEMP AT WHICH MECH COOLING IS ALLOWED TO OPERATE |
| MIN_FLOW_DV | OUTSIDE AIR MIN FLOW SP | R/W | AV13 | 1038 | DISPLAYS THE MIN AIRFLOW FOR DEMAND VENTILATION WITH AN AIRFLOW STATION (CFM) |
| MIXD_SAT_LIM | MX SUPPLY AIR TEMP SP **(FLEXSYS)** | R/W | AV14 | 1039 | DISPLAYS THE ACTIVE MIXED AIR TEMP SP **(OCC COOLING W/O BYPASS-COMPRESSOR CONTROL) (OCC COOLING W/ BYPASS-DAMPER CONTROL)** |
| MORN_WARM_ UP | MORNING WARM UP | R/W | AV85 BV09 | 1110 | A BAS COMMAND THAT ALLOWS MORNING WARM-UP TO BE ENABLED/DISABLED: 0=ENABLED 1-DISABLED |
| MORN_WUP_ CMD | MORN WARMUP COMMAND | R/W | AV86 BV10 | 1111 | A BAS COMMAND THAT STARTS/ STOPS MORNING WARM-UP: 0=OFF 1=ON |
| MORN_WUP_RAT | HEATING RET AIR TEMP SP **(VAV or FLEXSYS)** | R/W | AV15 | 1040 | DISPLAYS THE ACTIVE R/A TEMP SP FOR HEATING |
| NIGHT_SETBAC | NIGHT SETBACK FOR HEATING | R/W | AV87 BV11 | 1112 | A BAS COMMAND THAT ALLOWS NIGHT SETBACK TO BE TURNED ON/OFF: 0=OFF 1=ON |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| OA_DAMP_POS1 | OA DAMPER MINIMUM POSITION | R/W | AV16 | 1041 | DISPLAYS THE ACTIVE SP FOR THE MIN OA DAMPER WHEN USING FIXED MINIMUM VENTILATION AND THE SUPPLY FAN VFD IS AT 100% |
| OA_DAMP_POS2 | OA DAMPER MAXIMUM POSITION | R/W | AV17 | 1042 | DISPLAYS THE MAX POSITION FOR THE OA DAMPER WHEN USING FIXED MINIMUM VENTILATION AND THE SUPPLY FAN VFD IS AT 50% |
| OA_DAMPER | OA DAMPER POSITION CURRENT | R | AI25 | 538 | DISPLAYS THE POSITION OF THE OA DAMPER (%) |
| OA_ENTH_LIMIT | OA ENTHALPY SP | R/W | AV18 | 1043 | DISPLAYS THE MAX ENTHALPY SP FOR USING OA FOR COOLING (BTU/LB) SINGLE or DUAL ENTHALPY |
| OA_ENTHALPY | OA ENTHALPY | R | AI26 | 539 | DISPLAYS THE CURRENT OA ENTHALPY (BTU/LB) |
| OA_FLO_PRS_1 | OA FLOW PRESS 1 | R | AI27 | 540 | NOT USED |
| OA_FLO_PRS_2 | OA FLOW PRESS 2 | R | AI28 | 541 | NOT USED |
| OA_FLOW_1 | IAQ DAMPER AIR FLOWS OA FLOW 1 | R | AI61 | 574 | DISPLAYS THE AIR FLOW THRU A TEK-AIR FULL IAQ AIR MEASURING STATION (CFM) |
| OA_FLOW_2 | IAQ DAMPER AIR FLOWS OA FLOW 2 | R | AI62 | 575 | NOT USED |
| OA_FLOW_TOTL | OA FLOW TOTAL | R | AI63 | 576 | DISPLAYS THE TOTAL AIR FLOW THRU A TEK-AIR FULL IAQ AIR MEASURING STATION (CFM) |
| OA_REL_HUMID | OA HUMIDITY | R | AI29 | 542 | DISPLAYS THE CURRENT OA RELATIVE HUMIDITY (%) |
| OA_TEMP | OA TEMPERATURE | R | AI30 | 543 | DISPLAYS THE CURRENT OA TEMP |
| OAT_HIGH_SAT | OA TEMP SP FOR HI SUPPLY AIR TEMP **(VAV, AND ONLY IF SAT RESET METHOD IS OUTSIDE AIR)** | R/W | AV19 | 1044 | DISPLAYS THE OA TEMP SP USED FOR SWITCHING TO THE HIGH SUPPLY AIR TEMP SP |
| OAT_LOW_SAT | OA TEMP SP FOR LO SUPPLY AIR TEMP **(VAV, AND ONLY IF SAT REST METHOD IS OUTSIDE AIR)** | R/W | AV20 | 1045 | DISPLAYS THE OA TEMP SP USED FOR SWITCHING TO THE LOW SUPPLY AIR TEMP SP |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| OCC_MODE | OCCUPANCY MODE STATUS | R | BI35 | 1316 | DISPLAYS THE OCC/UNOCC STATUS WITH HARDWIRED, COMMUNICATED, or INTERNAL CLOCK SCHEDULE INPUT: ENA=ENABLED/OCC DIS=DISABLED/UNOCC |
| OCC_STATE | OCCUPANCY STATE STATUS | R | BI36 | 1317 | DISPLAYS THE STATUS OF THE HARDWIRED INPUT: ENA=ENABLED/OCC DIS=DISABLED/UNOCC |
| OCC_ZN_COOL | OCC ZONE COOLING SP | R/W | AV21 | 1046 | DISPLAYS THE ACTIVE OCCUPIED ZONE COOLING SP |
| OCC_ZN_HEAT | OCC ZONE HEATING SP | R/W | AV22 | 1047 | DISPLAYS THE ACTIVE OCCUPIED ZONE HEATING SP |
| OCCUPNCY_ CMD | OCCUPANCY COMMAND | R/W | AV88 BV12 | 1113 | A BAS COMMAND THAT ALLOWS THE UNIT TO BE PLACED IN THE OCC/UNOCC MODE: 0=UNOCC 1=OCC |
| PRS_1_DISCH | DISCH PRESS CKT 1 | R | AI31 | 544 | DISPLAYS THE CURRENT DISCH PRESS OF CKT 1 (PSIG) |
| PRS_1_SUCT | SUCT PRESS CKT 1 | R | AI32 | 545 | DISPLAYS THE CURRENT SUCT PRESS OF CKT 1 (PSIG) |
| PRS_2_DISCH | DISCH PRESS CKT 2 | R | AI33 | 546 | DISPLAYS THE CURRENT DISCH PRESS OF CKT 2 (PSIG) |
| PRS_2_SUCTION | SUCT PRESS CKT 2 | R | AI34 | 547 | DISPLAYS THE CURRENT SUCT PRESS OF CKT 2 (PSIG) |
| PRS_3_DISCH | DISCH PRESS CKT 3 **(70-150 TON ONLY)** | R | AI35 | 548 | DISPLAYS THE CURRENT DISCH PRESS OF CKT 3 (PSIG) |
| PRS_3_SUCT | SUCT PRESS CKT 3 **(70-150 TON ONLY)** | R | AI36 | 549 | DISPLAYS THE CURRENT SUCT PRESS OF CKT 3 (PSIG) |
| PUMP_DOWN | PUMP DOWN | R/W | AV89 BV13 | 1114 | A BAS COMMAND THAT ALLOWS THE PUMP DOWN FEATURE TO BE TURNED ON/OFF: 0=ON 1=OFF |
| PUMP_DOWN_1 | PUMP DOWN LLSV 1 STATUS | R | BI37 | 1318 | DISPLAYS THE STATUS OF THE OUTPUT TO THE CKT 1 LIQ LINE SOLENOID VLV: 0=ON 1=OFF |
| PUMP_DOWN_2 | PUMP DOWN LLSV 2 STATUS | R | BI38 | 1319 | DISPLAYS THE STATUS OF THE OUTPUT TO THE CKT 2 LIQ LINE SOLENOID VLV: 0=ON 1=OFF |
| PUMP_DOWN_3 | PUMP DOWN LLSV 3 STATUS **(70-150 TON ONLY)** | R | BI39 | 1320 | DISPLAYS THE STATUS OF THE OUTPUT TO THE CKT 3 LIQ LINE SOLENOID VLV: 0=ON 1=OFF |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| RA_DIFF_BAS | RETURN AIR DIFF SP BAS **(FLEXSYS)** | R/W | AV42 | 1067 | DISPLAYS THE ACTIVE DIFFERENTIAL SP BETWEEN THE RAT AND THE MX SAT SP WHICH IS UTILIZED IN THE INTERNAL LOGIC FOR SELECTING THE PROPER FLEXSYS COOLING MODE; OCC COOLING W/ BYPASS or COOLING W/O BYPASS |
| RAT_COOL_SP | COOLING RETURN AIR TEMP SP **(VAV or FLEXSYS)** | R/W | AV23 | 1048 | DISPLAYS THE ACTIVE RETURN AIR TEMP SP FOR COOLING |
| RAT_HIGH_SAT | RA TEMP SP FOR HI SUPPLY AIR TEMP **(VAV, AND ONLY IF SAT RESET METHOD IS RETURN AIR)** | R/W | AV24 | 1049 | DISPLAYS THE RA TEMP SP USED FOR SWITCHING TO THE HIGH SUPPLY AIR TEMP SP |
| RAT_LOW_SAT | RA TEMP SP FOR LO SUPPLY AIR TEMP **(VAV, AND ONLY IF SAT RESET METHOD IS RETURN AIR)** | R/W | AV25 | 1050 | DISPLAYS THE RA TEMP SP USED FOR SWITCHING TO THE LOW SUPPLY AIR TEMP SP |
| RDY_RUN_C1A | READY TO RUN COMP 1A STATUS | R | BI40 | 1321 | DISPLAYS THE STATUS OF COMP 1A READY TO RUN IF THE COMP IS OFF: YES/NO |
| RDY_RUN_C1B | READY TO RUN COMP 1B STATUS | R | BI41 | 1322 | DISPLAYS THE STATUS OF COMP 1B READY TO RUN IF THE COMP IS OFF: YES/NO |
| RDY_RUN_C2A | READY TO RUN COMP 2A STATUS | R | BI42 | 1323 | DISPLAYS THE STATUS OF COMP 2A READY TO RUN IF THE COMP IS OFF: YES/NO |
| RDY_RUN_C2B | READY TO RUN COMP 2B STATUS | R | BI43 | 1324 | DISPLAYS THE STATUS OF COMP 2B READY TO RUN IF THE COMP IS OFF: YES/NO |
| RDY_RUN_C3A | READY TO RUN COMP 3A STATUS **(70-150 TON ONLY)** | R | BI44 | 1325 | DISPLAYS THE STATUS OF COMP 3A READY TO RUN IF THE COMP IS OFF: YES/NO |
| RDY_RUN_C3B | READY TO RUN COMP 3B STATUS **(70-150 TON ONLY)** | R | BI45 | 1326 | DISPLAYS THE STATUS OF COMP 3B READY TO RUN IF THE COMP IS OFF: YES/NO |
| RDY_STOP_C1A | READY TO STOP COMP 1A STATUS | R | BI46 | 1327 | DISPLAYS THE STATUS OF COMP 1A READY TO STOP IF OPERATING: YES/NO |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| RDY_STOP_C1B | READY TO STOP COMP 1B STATUS | R | BI47 | 1328 | DISPLAYS THE STATUS OF COMP 1B READY TO STOP IF OPERATING: YES/NO |
| RDY_STOP_C2A | READY TO STOP COMP 2A STATUS | R | BI48 | 1329 | DISPLAYS THE STATUS OF COMP 2A READY TO STOP IF OPERATING: YES/NO |
| RDY_STOP_C2B | READY TO STOP COMP 2B STATUS | R | BI49 | 1330 | DISPLAYS THE STATUS OF COMP 2B READY TO STOP IF OPERATING: YES/NO |
| RDY_STOP_C3A | READY TO STOP COMP 3A STATUS **(70-150 TON ONLY)** | R | BI50 | 1331 | DISPLAYS THE STATUS OF COMP 3A READY TO STOP IF OPERATING: YES/NO |
| RDY_STOP_C3B | READY TO STOP COMP 3B STATUS **(70-150 TON ONLY)** | R | BI51 | 1332 | DISPLAYS THE STATUS OF COMP 3B READY TO STOP IF OPERATING: YES/NO |
| RET_AIR_BY_S | RETURN AIR BYPASS ACTIVE SP | R | AI37 | 550 | DISPLAYS THE VALUE (%) FOR THE CURRENT SP OF THE RA BYPASS DAMPER ON A FLEXSYS UNIT |
| RET_AIR_ENTH | RETURN AIR ENTHALPY | R | AI38 | 551 | DISPLAYS THE ACTUAL RA ENTHALPY (BTU/LB) |
| RET_AIR_HUMD | RETURN AIR HUMIDITY | R | AI39 | 552 | DISPLAYS THE ACTUAL RA RELATIVE HUMIDITY (%) |
| RET_AIR_TEMP | RETURN AIR TEMP CURRENT | R | AI40 | 553 | DISPLAYS THE ACTUAL RA TEMP (°F) |
| RET_FAN_OUT | EXHAUST/ RETURN FAN VFD | R | AI41 | 554 | DISPLAYS THE OUTPUT FROM THE CONTROL TO THE EXH OR RET FAN VFD (%) |
| RET_FAN_PRES | RETURN FAN PRESSURE CURRENT | R | AI42 | 555 | DISPLAYS THE ACTUAL PRESSURE THAT IS USED TO CONTROL THE RETURN FAN SPEED ("W.C.) |
| RET_FAN_STAT | RETURN FAN STATUS | R | BI52 | 1333 | DISPLAYS THE STATUS OF THE RETURN FAN RUN VERIFICATION CIRCUIT: 0=STOP/VERIFICATION CKT OPEN, 1=RUN/VERIFICATION CKT CLOSED |
| RST_ENT_BAS | RESET ENTHALPY SP BAS **(FLEXSYS)** | R/W | AV41 | 1066 | DISPLAYS THE RA ENTHALPY SP WHICH CAUSES THE UNIT TO SWITCH FROM THE EVAP LEAVING HIGH SP TO THE EVAP LEAVING LOW SP |
| SAT_HIGH_LIM | SUPPY AIR TEMP HI SP | R/W | AV26 | 1051 | DISPLAYS THE UPPER LIMIT FOR THE SUPPLY AIR TEMP SP ON A VAV UNIT (°F) |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| SAT_LOW_LIM | SUPPLY AIR TEMP LO SP | R/W | AV27 | 1052 | DISPLAYS THE LOWER LIMIT FOR THE SUPPLY AIR TEMP SP ON A VAV UNIT (°F) |
| SAT_RST_BAS | SUPPLY AIR TEMP RESET BAS | R/W | AV28 | 1053 | DISPLAYS THE ANALOG INPUT FROM THE BAS SYSTEM THAT ALLOWS THE RESET OF THE ACTIVE SUPPLY AIR TEMP SP. 0 USES SAT HIGH SP AND 5 USES SAT LOW SP. "SAT RST BAS" MUST BE ENABLED IN THE SERVICE MENU FOR THIS POINT TO FUNCTION |
| SAT_SUC_TMP1 | SATURATED SUCT TEMP CKT 1 | R | AI43 | 556 | DISPLAYS THE SATURATION TEMP OF SYSTEM 1 SUCTION GAS BASED ON SYSTEM 1 SUCTION PRESS (°F) |
| SAT_SUC_TMP2 | SATURATED SUCT TEMP CKT 2 | R | AI44 | 557 | DISPLAYS THE SATURATION TEMP OF SYSTEM 2 SUCTION GAS BASED ON SYSTEM 2 SUCTION PRESS (°F) |
| SAT_SUC_TMP3 | SATURATED SUCT TEMP CKT 3 **(70-150 TON ONLY)** | R | AI45 | 558 | DISPLAYS THE SATURATION TEMP OF SYSTEM 3 SUCTION GAS BASED ON SYSTEM 3 SUCTION PRESS (°F) |
| SAT_TEMPER | SUPPLY AIR TEMPERING STATUS | R | BI53 | 1334 | DISPLAYS THE STATUS OF SUPPLY AIR TEMPERING: ON/OFF |
| SEN/MSC_FLT | SENSOR/MISC FAULT STATUS | R | BI54 | 1335 | DISPLAYS THE STATUS OF A SENSOR OR MISC FAULT: 0=NO FAULT 1=FAULTED |
| SF_PROV_SW | SUPPLY FAN STATUS | R | BI55 | 1336 | DISPLAYS THE STATUS OF THE SUPPLY FAN AIR PROVING CIRCUIT: 0=STOP VERIFICATION/CKT OPEN 1=RUN VERIFICATION/CKT CLOSED |
| SF_SPD_H_SAT | FAN SPEED SP FOR HI SUPPLY AIR TEMP | R/W | AV29 | 1054 | DISPLAYS THE SUPPLY FAN SPEED SP USED FOR SWITCHING TO THE HIGH SUPPLY AIR TEMP SP |
| SF_SPD_L_SAT | FAN SPEED SP FOR LO SUPPLY AIR TEMP | R/W | AV30 | 1055 | DISPLAYS THE SUPPLY FAN SPEED SP USED FOR SWITCHING TO THE LOW SUPPLY AIR TEMP SP |
| SMOKE_PUR_1 | SMOKE PURGE 1 STATUS | R | BI56 | 1337 | DISPLAYS THE STATUS OF THE SMOKE PURGE 1 INPUT EITHER HARDWIRED OR COMMUNICATED: ON/OFF |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| SMOKE_PUR_2 | SMOKE PURGE 2 STATUS | R | BI57 | 1338 | DISPLAYS THE STATUS OF THE SMOKE PURGE 2 INPUT EITHER HARDWIRED OR COMMUNICATED: ON/OFF |
| SMOKE_PUR_3 | SMOKE PURGE 3 STATUS | R | BI58 | 1339 | DISPLAYS THE STATUS OF THE SMOKE PURGE 3 INPUT EITHER HARDWIRED OR COMMUNICATED: ON/OFF |
| SMOKE_PUR1_B | SMOKE PURGE 1 BAS | R/W | AV90 BV14 | 1115 | A BAS COMMAND THAT ALLOWS SMOKE PURGE 1 TO BE ACTIVATED: 0=OFF 1=ON |
| SMOKE_PUR2_B | SMOKE PURGE 2 BAS | R/W | AV91 BV15 | 1116 | A BAS COMMAND THAT ALLOWS SMOKE PURGE 2 TO BE ACTIVATED: 0=OFF 1=ON |
| SMOKE_PUR3_B | SMOKE PURGE 3 BAS | R/W | AV92 BV16 | 1117 | A BAS COMMAND THAT ALLOWS SMOKE PURGE 3 TO BE ACTIVATED: 0=OFF 1=ON |
| STG_1_COOL | 1ST STAGE COOLING SP **(CV AND SZVAV ONLY)** | R/W | AV31 | 1056 | DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP FOR A 1ST STAGE COOLING INPUT (Y1) |
| STG_1_HEAT | 1ST STAGE HEATING SP **(CV AND SZVAV ONLY)** | R/W | AV32 | 1057 | DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP FOR A 1ST STAGE HEATING INPUT (W1) |
| STG_2_COOL | 2ND STAGE COOLING SP **(CV AND SZVAV ONLY)** | R/W | AV33 | 1058 | DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP FOR A 2ND STAGE COOLING INPUT (Y2) |
| STG_2_HEAT | 2ND STAGE HEATING SP **(CV AND SZVAV ONLY)** | R/W | AV34 | 1059 | DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP FOR A 2ND STAGE HEATING INPUT (W2) |
| SUP_AIR_TEMP | SUPPLY AIR TEMP CURRENT | R | AI46 | 559 | **CV or VAV:** DISPLAYS THE ACTUAL TEMP OF THE SUPPLY AIR (°F)<br>**FLEXSYS:** DISPLAYS THE ACTUAL TEMP OF THE MX SUPPLY AIR TEMP (°F) |
| SUP_AIR_TRST | SUPPLY AIR TEMP RESET | R | AI47 | 560 | DISPLAYS THE VALUE, 0-5 VDC, OF A HARDWIRED OR COMMUNICATED INPUT THAT WILL BE USED TO RESET THE SUPPLY AIR TEMP SP (VDC) |
| SUP_FAN_VFD | SUPPLY FAN VFD SPEED | R | AI48 | 561 | DISPLAYS THE OUTPUT FROM THE CONTROL TO THE SUPPLY FAN VFD (%) |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| SUPPLY_FAN | SUPPLY FAN OUTPUT STATUS | R | BI59 | 1340 | DISPLAYS THE STATUS OF THE OUTPUT FROM THE CONTROLLER TO THE SUPPLY FAN CIRCUIT: 0=OFF 1=ON |
| SYSTEM_STOP | SYSTEM STOP | R/W | AV35 | 1060 | ALLOWS A BAS COMMAND THAT MANUALLY SHUTS DOWN COMPRESSOR CIRCUITS: 0=ALL CKTS CAN OPERATE 1=SHUTS DOWN CKT 1 2=SHUTS DOWN CKT 2 3=SHUTS DOWN CKT 3 |
| SZ_MIN_VFD | SINGLE ZONE VAV MIN FAN SPEED | R/W | AV53 | NA* | THIS IS THE MINIMUM SPEED THE SUPPLY FAN VFD WILL OPERATE AT WHEN IN SINGLE ZONE VAV MODE |
| TEMP_1_SUCT | SUCT TEMP CKT 1 | R | AI49 | 562 | DISPLAYS THE ACTUAL SYSTEM 1 SUCT LINE TEMP (°F) |
| TEMP_1_SUPER | SUCT SUPERHEAT CKT 1 | R | AI50 | 563 | DISPLAYS THE SYSTEM 1 SUPERHEAT (°F) |
| TEMP_2_SUCT | SUCT TEMP CKT 2 | R | AI51 | 564 | DISPLAYS THE ACTUAL SYSTEM 2 SUCT LINE TEMP (°F) |
| TEMP_2_SUPER | SUCT SUPERHEAT CKT 2 | R | AI52 | 565 | DISPLAYS THE SYSTEM 2 SUPERHEAT (°F) |
| TEMP_3_SUCT | SUCT TEMP CKT 3 **(70-150 TON ONLY)** | R | AI53 | 566 | DISPLAYS THE ACTUAL SYSTEM 3 SUCT LINE TEMP (°F) |
| TEMP_3_SUPER | SUCT SUPERHEAT CKT 3 **(70-150 TON ONLY)** | R | AI54 | 567 | DISPLAYS THE SYSTEM 3 SUPERHEAT (°F) |
| UND_FLR_DEWP | UNDERFLOOR SLAB DEW POINT **(FLEXSYS)** | R | AI55 | 568 | DISPLAYS THE CALCULATED DEW POINT OF THE UNDERFLOOR AIR (°F) |
| UND_FLR_HUMD | UNDERFLOOR AIR HUMIDITY **(FLEXSYS)** | R | AI56 | 569 | DISPLAYS THE HUMIDITY VALUE OF THE UNDERFLOOR AIR (°F) |
| UND_FLR_TEMP | UNDEFLOOR SLAB TEMP **(FLEXSYS)** | R | AI57 | 570 | DISPLAYS THE TEMP OF THE UNDERFLOOR SLAB (°F) |
| UND_HUMD_BAS | UNDERFLOOR AIR HUMIDITY BAS **(FLEXSYS)** | R/W | AV36 | 1061 | ALLOWS THE BAS SYSTEM TO INPUT AN UNDERFLOOR AIR HUMIDITY VALUE TO THE CONTROL. (% RH) "UNDER FLR HUMI BAS" MUST BE ENABLED IN THE SERVICE MENU FOR THIS POINT TO FUNCTION |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| UND_TEMP_BAS | UNDERFLOOR SLAB TEMP BAS **(FLEXSYS)** | R/W | AV37 | 1062 | ALLOWS THE BAS SYSTEM TO INPUT AN UNDERFLOOR SLAB TEMP VALUE TO THE CONTROL (°F) "UNDER FLR TEMP BAS" MUST BE ENABLED IN THE SERVICE MENU FOR THIS POINT TO FUNCTION |
| UNIT_MODE | CURRENT OPER MODE | R | AI58 | 571 | 0=OCC COOLING |
| | | | | | 1=OCC COOLING LOW |
| | | | | | 2=OCC COOLING HIGH |
| | | | | | 3=OCC COOLING W/ BYPASS |
| | | | | | 4=OCC COOLING W/O BYPASS |
| | | | | | 5= OCC HEATING |
| | | | | | 6=OCC HEATING LOW |
| | | | | | 7=OCC HEATING HIGH |
| | | | | | 8=OCC STANDBY |
| | | | | | 9=UNOCC COOLING |
| | | | | | 10=UNOCC COOLING LOW |
| | | | | | 11=UNOCC COOLING HIGH |
| | | | | | 12=UNOCC HEATING |
| | | | | | 13=UNOCC HEATING LOW |
| | | | | | 14=UNOCC HEATING HIGH |
| | | | | | 15=UNOCC STANDBY |
| | | | | | 16=COMFORT VENT COOLING |
| | | | | | 17=COMFORT VENT HEATING |
| | | | | | 18=NIGHT SET-BACK |
| | | | | | 19=MORNING WARM-UP |
| | | | | | 20=POWER UP STANDBY |
| UNIT_STOP | UNIT STOP | R/W | AV93 BV17 | 1118 | A BAS COMMAND THAT ALLOWS THE UNIT TO BE SHUT DOWN: 0=NORMAL OPERATION 1=UNIT STOPPED |
| UNSTABLE_SYS | UNSTABLE SYSTEM STATUS (NOT USED) | R | BI60 | | |
| UNOCC_ZN_ COOL | UNOCC ZONE COOLING SP | R/W | AV38 | 1063 | UNOCC ZONE COOLING SP |
| UNOCC_ZN_ HEAT | UNOCC ZONE HEATING SP | R/W | AV39 | 1064 | UNOCC ZONE HEATING SP |
| VAV_HEAT | VAV HEAT RELAY STATUS | R | BI61 | 1342 | DISPLAYS THE STATUS OF THE OUTPUT THAT ENERGIZES A VAV HEAT RELAY: OFF/ON |
| VENT_CONTROL | VENTILATION CONTROL | R/W | AV94 BV18 | 1119 | A BAS COMMAND THAT ALLOWS THE SELECTION OF THE VENTILATION FUNCTION: 0=FIXED MINIMUM 1=DEMAND |

**TABLE 1 -** BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| VENT_DEM_OUT | VENTILATION DEMAND | R | AI59 | 572 | DISPLAYS THE STATUS OF THE VENTILATION OUTPUT FOR DEMAND VENTILATION (%) |
| VENT_ENABLE | VENTILATION SYSTEM | R/W | AV95 BV19 | 1120 | A BAS COMMAND THAT ALLOWS THE VENTILATION FUNCTION TO BE TURNED ON OR OFF: 0=OFF 1=ON |
| W1_LO_HEAT_B | W1 LO HEAT BAS | R/W | AV96 BV20 | 1121 | A BAS COMMAND THAT ALLOWS AN INPUT FOR W1, FIRST STAGE HEAT: 0=OFF 1=ON |
| W1_LOW_HEAT | W1 LOW HEAT STATUS | R | BI62 | 1343 | DISPLAYS THE STATUS OF THE W1 HEAT INPUT EITHER HARDWIRED OR COMMUNICATED FROM A BAS: ON/OFF |
| W2_HI_HEAT_B | W2 HIGH HEAT BAS | R/W | AV97 BV21 | 1122 | A BAS COMMAND THAT ALLOWS AN INPUT FOR W2, SECOND STAGE HEAT: 0=OFF 1=ON |
| W2_HIGH_HEAT | W2 HIGH HEAT STATUS | R | BI63 | 1344 | DISPLAYS THE STATUS OF THE W2 HEAT INPUT EITHER HARDWIRED OR COMMUNICATED FROM A BAS: ON/OFF |
| Y1_LO_COOL_B | Y1 LO COOL BAS | R/W | AV98 BV22 | 1123 | A BAS COMMAND THAT ALLOWS AN INPUT FOR Y1, FIRST STAGE COOL: 0=OFF 1=ON |
| Y1_LOW_COOL | Y1 LOW COOL STATUS | R | BI64 | 1345 | DISPLAYS THE STATUS OF THE Y1 COOL INPUT EITHER HARDWIRED OR COMMUNICATED FROM A BAS: ON/OFF |
| Y2_HI_COOL_B | Y2 HIGH COOL BAS | R/W | AV99 BV23 | 1124 | A BAS COMMAND THAT ALLOWS AN INPUT FOR Y2, SECOND STAGE COOL: 0=OFF 1=ON |
| Y2_HIGH_COOL | Y2 HIGH COOL STATUS | R | BI65 | 1346 | DISPLAYS THE STATUS OF THE Y2 COOL INPUT EITHER HARDWIRED OR COMMUNICATED FROM A BAS: ON/OFF |
| ZONE_TEMP | ZONE TEMP CURRENT | R | AI60 | 573 | DISPLAYS THE ACTUAL ZONE TEMPERATURE (°F) |
| ZONE_TEMP_ BAS | ZONE TEMP BAS | R/W | AV40 | 1065 | ALLOWS THE BAS SYSTEM TO INPUT AN ZONE TEMPERATURE READING (°F) THE CONTROL METHOD MUST BE SET TO "COMM ZONE TEMP" FOR THIS POINT TO FUNCTION |

**NOTE:**
For a list of LON or N2 points, please refer to the appropriate IOM.

**TABLE 2 -** SERIES 100 FLEXSYS BACNET MS/TP POINTS

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| ACT_SAT_SP | ACTIVE SUPPLY AIR TEMP SP | R | AI04 | 517 | **CV** or **VAV:** DISPLAYS THE ACTIVE SUPPLY AIR TEMP SP<br>**FLEXSYS:** IF CURRENT MODE IS OCC COOLING W/O BYPASS, THIS WILL BE = TO THE MX SAT SP (*MIXD_SAT_LIM; AV14*). IF CURRENT MODE IS OCC COOLING W/ BYPASS, THIS WILL BE = TO EITHER THE EVAP LEAVING HIGH SP (*EL_AIR_ TMP_H; AV07*) OR THE EVAP LEAVING LOW SP (*EL_AIR_ TMP_I; AV08*) DEPENDING ON THE SYSTEM CONDITIONS |
| BYPASS_ DAMPER | BYPASS DAMPER POSITION **(FLEXSYS ONLY)** | R | AI06 | 519 | DISPLAYS THE ACTUAL BYPASS DAMPER POSITION (%) |
| DEW_PNT_RST | DEW POINT RESET **(FLEXSYS)** | R/W | AV80 BV04 | 1105 | ALLOWS THE DEW POINT RESET FEATURE TO BE TURNED ON/OFF: 0=OFF 1=ON |
| EL_AIR_TMP_H | EVAP LEAVING AIR TEMP HIGH SP **(FLEXSYS)** | R/W | AV07 | 1032 | DISPLAYS THE ACTIVE SP FOR THE HIGH EVAP LEAVING AIR TEMP. THIS IS THE SP THE COMPRESSORS ARE CONTROLLED TO **(OCC COOLING W/ BYPASS)** |
| EL_AIR_TMP_L | EVAP LEAVING AIR TEMP LOW SP **(FLEXSYS)** | R/W | AV08 | 1033 | DISPLAYS THE ACTIVE SP FOR THE LOW EVAP LEAVING AIR TEMP. THIS IS THE SP THE COMPRESSORS ARE CONTROLLED TO **(OCC COOLING W/ BYPASS)** |
| EVAP_AIR_TMP | FLEXSYS EVAP TEMP CURRENT **(FLEXSYS)** | R | AI20 | 533 | DISPLAYS THE ACTUAL TEMP OF THE AIR LEAVING THE EVAPORATOR **(OCC COOLING W/ BYPASS)** |
| MAX_BYPASS | MAXIMUM BYPASS SP **(FLEXSYS)** | R/W | AV10 | 1035 | DISPLAYS THE MAX SETTING FOR THE BYPASS DAMPER |
| MIXD_SAT_LIM | MX SUPPLY AIR TEMP SP **(FLEXSYS)** | R/W | AV14 | 1039 | DISPLAYS THE ACTIVE MIXED AIR TEMP SP **(OCC COOLING W/O BYPASS-COMPRESSOR CONTROL) (OCC COOLING W/ BYPASS-DAMPER CONTROL)** |

**TABLE 2 -** SERIES 100 FLEXSYS BACNET MS/TP POINTS (CONT'D)

| BACNET NAME | USER INTERFACE NAME | READ/ WRITE | BACNET/ OBJECT TYPE AND INSTANCE | MODBUS REGISTER ADDRESS | POINTS LIST DESCRIPTION |
|---|---|---|---|---|---|
| RA_DIFF_BAS | RETURN AIR DIFF SP BAS **(FLEXSYS)** | R/W | AV42 | 1067 | DISPLAYS THE ACTIVE DIFFERENTIAL SP BETWEEN THE RAT AND THE MX SAT SP WHICH IS UTILIZED IN THE INTERNAL LOGIC FOR SELECTING THE PROPER FLEXSYS COOLING MODE; OCC COOLING W/ BYPASS or COOLING W/O BYPASS |
| RST_ENT_BAS | RESET ENTHALPY SP BAS **(FLEXSYS)** | R/W | AV41 | 1066 | DISPLAYS THE RA ENTHALPY SP WHICH CAUSES THE UNIT TO SWITCH FROM THE EVAP LEAVING HIGH SP TO THE EVAP LEAVING LOW SP |
| SUP_AIR_TEMP | SUPPLY AIR TEMP CURRENT | R | AI46 | 559 | **CV or VAV:** DISPLAYS THE ACTUAL TEMP OF THE SUPPLY AIR (°F)<br>**FLEXSYS:** DISPLAYS THE ACTUAL TEMP OF THE MX SUPPLY AIR TEMP (°F) |
| UND_FLR_HUMD | UNDERFLOOR AIR HUMIDITY **(FLEXSYS)** | R | AI56 | 569 | DISPLAYS THE HUMIDITY VALUE OF THE UNDERFLOOR AIR (°F) |
| UND_FLR_TEMP | UNDEFLOOR SLAB TEMP **(FLEXSYS)** | R | AI57 | 570 | DISPLAYS THE TEMP OF THE UNDERFLOOR SLAB (°F) |
| UND_HUMD_BAS | UNDERFLOOR AIR HUMIDITY BAS **(FLEXSYS)** | R/W | AV36 | 1061 | ALLOWS THE BAS SYSTEM TO INPUT AN UNDERFLOOR AIR HUMIDITY VALUE TO THE CONTROL. (% RH) "UNDER FLR HUMI BAS" MUST BE ENABLED IN THE SERVICE MENU FOR THIS POINT TO FUNCTION |
| UND_TEMP_BAS | UNDERFLOOR SLAB TEMP BAS **(FLEXSYS)** | R/W | AV37 | 1062 | ALLOWS THE BAS SYSTEM TO INPUT AN UNDERFLOOR SLAB TEMP VALUE TO THE CONTROL (°F) "UNDER FLR TEMP BAS" MUST BE ENABLED IN THE SERVICE MENU FOR THIS POINT TO FUNCTION |

**TABLE 3 -** WARNING DESCRIPTION TABLE

| HISTORY SCREEN WORDING | DESCRIPTION | RESET | SHOW WHEN UNIT TYPE IS | STATUS SCREEN WORDING | FAULT OUTPUT TYPE |
|---|---|---|---|---|---|
| WRN-BUILDING PRS | BUILDING STATIC PRES more than 0.45 "W.C. OR less than -0.45 "W.C. FOR 10 SECONDS. POWER EXHAUST REVERTS TO NONE OR ON/OFF | AUTO RESET | POWER EXHAUST OTHER THAN NONE OR ON - OFF DAMPER | EXHAUST SYS STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-CO2 SENSOR 1 OUTSIDE | OUTSIDE CO2 SENSOR OUT OF RANGE FOR more than or equal to 15 MINUTES | AUTO RESET | VENTILATION CONTROL EQUALS DEMAND | VENTILATION SYS STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-CO2 SENSOR 2 INSIDE | OUTSIDE CO2 SENSOR OUT OF RANGE FOR more than or equal to 15 MINUTES | AUTO RESET | VENTILATION CONTROL EQUALS DEMAND | VENTILATION SYS STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-COMPR SYSTEM * INHIBIT | SEE DESCRIPTION AT THE END OF THIS TABLE | AUTO RESET | | | COOLING HEATING FAULT |
| WRN-DIRTY FILTER 1 | THE FILTER STATUS INPUT IS CLOSED FOR more than or equal to 1 MINUTE | AUTO RESET | DIRTY FILTER SWITCH IS INSTALLED | FILTER STATUS CHANGE | SENSOR/ MISC FAULT |
| WRN-DISCHARGE PRS SENSOR* | THE DISCHARGE PRESURE FOR THAT SYSTEM IS OUT OF RANGE FOR more than or equal to 10 SECONDS | AUTO RESET | PRESS TRANS PKG IS ON FOR THE SYSTEM | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-DUCT PRS XDCR | SUPPLY FAN OUTPUT ON, SUPPLY FAN STATUS MUST BE RUNNING FOR 5 MINUTES, STATIC PRESS CURRENT less than or equal to (0.333 X DUCT STATIC PRESS ACTIVE SP) FOR 30 SECONDS | AUTO RESET | UNIT TYPE IS VAV OR FLEXSYS | SUPPLY SYS STATUS WARNING | FAN FAULT |
| WRN-EXHAUST FAN | THE EXHAUST FAN OUTPUT IS ON FOR 45 SECONDS AND THE RUN VERIFICATION INPUT IS LOW (OPEN) FOR 10 SECONDS | AUTO RESET | POWER EXHAUST OTHER THEN NONE | EXHAUST SYSTEM STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-FREEZESTAT TRIP | THE HW/STEAM FREEZSTAT CIRCUIT GOES LOW (OPEN) BUT GOES HIGH (CLOSED) WITHIN 5 MINUTES | AUTO RESET | HEATING SYSTEM TYPE EQUALS HOT WATER STEAM | SENSOR/ MISC STATUS WARNING | COOLING HEATING FAULT |
| WRN-FURNACE MULTIPLEXER FAULT | ON MODULATING GAS THE HEAT BINARY OUTPUTS DO NOT MATCH THE GAS FURANCE STATUS INPUT. SEE *TABLE 65 ON PAGE 195* OR NO FURNACE STATUS INPUT ON STAGED GAS | AUTO RESET | HEATING SYSTEM TYPE EQUALS MODULATING GAS OR STAGED GAS | SENSOR/ MISC STATUS WARNING | COOLING HEATING FAULT |
| WRN-GAS FURNACE | THE HEAT BINARY OUTPUTS DO NOT MATCH THE GAS FURANCE STATUS INPUT. SEE *TABLE 66 ON PAGE 195* | AUTO RESET | HEATING SYSTEM TYPE EQUALS STAGED GAS | | COOLING HEATING FAULT |

* CAN BE 1, 2, OR 3 # CAN BE A OR B

**TABLE 2 -** WARNING DESCRIPTION TABLE (CONT'D)

| HISTORY SCREEN WORDING | DESCRIPTION | RESET | SHOW WHEN UNIT TYPE IS | STATUS SCREEN WORDING | FAULT OUTPUT TYPE |
|---|---|---|---|---|---|
| WRN-HET SENSOR | THE HEAT ENTERING SENSOR IS OUT OF RANGE FOR more than or equal to 10 SECONDS | AUTO RESET | HEATING SYSTEM TYPE IS STAGED GAS OR ELECTRIC | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-HIGH DP UNLOAD *# | BOTH COMPRESSOR ARE ON FOR THE SYSTEM AND THE DISCHARGE PRESS IS more than or equal to TO THE SYSTEM UNLOADING PRESSURE FOR 10 SECONDS | AUTO RESET | PRESS TRANS PKG IS ON FOR THE SYSTEM | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-LOW AMBIENT TEMP * | THE OUTDOOR TEMP IS less than or equal to THE MECH COOL LOCKOUT TEMP | AUTO RESET | LOW AMBIENT PKG IS NOT INSTALLED FOR THE SYSTEM | COMP SYS * STATUS LOW AMB INHIBIT | SENSOR/ MISC FAULT |
| WRN-LOW SUCTION TEMP *# | THE SUCTION TEMP IS LEES THAN THE SUCTION TEMP LOW LIMIT FOR 10 CONTINUOUS SECONDS | AUTO RESET | | COMP SYS * STATUS SUCTION TEMP UNL # ON | SENSOR/ MISC FAULT |
| WRN-OA FLOW PRS 1 | REFER TO AIR MEASUREMENT STATION SENSOR FAULTS IN SECTION 5 OF THE MANUAL | LOCKS OUT THE AIR MEASURING STATION | DAMPER HARDWARE IS MINIMUM IAQ, FULL IAQ, 1/3-2/3 IAQ, TEK AIR FULL IAQ | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-OA FLOW PRS 2 | REFER TO AIR MEASUREMENT STATION SENSOR FAULTS IN SECTION 5 OF THE MANUAL | LOCKS OUT THE AIR MEASURING STATION | DAMPER HARDWARE IS 1/3 - 2/3 IAQ | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-OUTSIDE AIR RH | OUTSIDE AIR TEMP more than or equal to 32 °F FOR 10 SECONDS OUTDOOR AIR HUMIDITY less than 5% FOR 10 SECONDS | AUTO RESET | ECONO INSTALLED SINGLE ENTHALPY OR DUAL ENTHALPY | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-RETURN AIR RH | RETURN AIR TEMP more than or equal to 32 °F FOR 10 SECONDS RETURN AIR HUMIDITY less than 5% FOR 10 SECONDS | AUTO RESET | ECONO INSTALLED DUAL ENTHALPY | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-RETURN FAN XDCR | SUPPLY FAN OUTPUT IS ON AND RETURN FAN PRESS CURRENT less than -0.95 "W.C. OR more than 0.95 "W.C. FOR 30 SECONDS OR SUPPLY FAN OUTPUT IS OFF AND RETURN FAN PRESSURE CURRENT less than -0.1 "W.C. OR more than 0.1 "W.C. FOR 5 MINUTES | AUTO RESET | POWER EXHAUST TYPE IS RETURN FAN W/EXH OR RETURN FAN W/O EXH | SUPPLY SYS STATUS WARNING | FAN FAULT |

* CAN BE 1, 2, OR 3  # CAN BE A OR B

**TABLE 2 -** WARNING DESCRIPTION TABLE (CONT'D)

| HISTORY SCREEN WORDING | DESCRIPTION | RESET | SHOW WHEN UNIT TYPE IS | STATUS SCREEN WORDING | FAULT OUTPUT TYPE |
|---|---|---|---|---|---|
| WRN-SLAB TEMP SENSOR | UDERFLOOR SLAB TEMP SENSOR IS OUT OF RANGE FOR more than or equal to10 SECONDS | AUTO RESET | UNIT TYPE IS FLEXSYS AND DEW POINT RESET IS USER ENABLED | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-SUCTION PRS SENSOR * | SUCTION PRESSURE OUT OF RANGE FOR more than or equal to 10 SECONDS | AUTO RESET | PRESS TRANS PKG IS ON FOR THE SYSTEM | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-SUCTION TEMP SENSOR * # | SUCTION TEMPERATURE SENSOR IS OUT OF RANGE FOR more than or equal to 10 SECONDS | AUTO RESET | | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |
| WRN-UNDER FLOOR RH SENSOR | UDERFLOOR AIR HUMIDITY IS less than 5% FOR more than or equal to 5 MINUTES | AUTO RESET | UNIT TYPE IS FLEXSYS AND DEW POINT RESET IS USER ENABLED | SENSOR/ MISC STATUS WARNING | SENSOR/ MISC FAULT |

* CAN BE 1, 2, OR 3  # CAN BE A OR B

The following factors can be used to convert from English to the most common SI Metric values.

**TABLE 4 -** SI METRIC CONVERSION

| MEASUREMENT | MULTIPLY ENGLISH UNIT | BY FACTOR | TO OBTAIN METRIC UNIT |
|---|---|---|---|
| Capacity | Tons Refrigerant Effect (ton) | 3.516 | Kilowatts (kW) |
| Power | Horsepower | 0.7457 | Kilowatts (kW) |
| Flow Rate | Gallons / Minute (gpm) | 0.0631 | Liters / Second (l/s) |
| Length | Feet (ft) | 0.3048 | Meters (m) |
| | Inches (in) | 25.4 | Millimeters (mm) |
| Weight | Pounds (lbs) | 0.4536 | Kilograms (kg) |
| Velocity | Feet / Second (fps) | 0.3048 | Meters / Second (m/s) |
| Pressure Drop | Feet of Water (ft) | 2.989 | Kilopascals (kPa) |
| | Pounds / Square Inch (psi) | 6.895 | Kilopascals (kPa) |

## TEMPERATURE

To convert degrees Fahrenheit (°F) to degrees Celsius (°C), subtract 32° and multiply by 5/9 or 0.5556.

Example: (45.0°F - 32°) x 0.5556 = 7.22°C

To convert a temperature range (i.e., a range of 10°F) from Fahrenheit to Celsius, multiply by 5/9 or 0.5556.

Example: 10.0°F range x 0.5556 = 5.6 °C range

# NOTES

P.O. Box 1592, York, Pennsylvania USA 17405-1592
800-861-1001
www.johnsoncontrols.com

Form 100.50-SU8 (116)
Issue Date: January 28, 2016
New Release