Operation and Maintenance Manual

OM 1280-5

Group: **Controls**
Part Number: **OM1280-5**
Date: **June 2024**

MicroTech® Controls for Classroom Unit Ventilators

Hazardous Information Messages

⚠ CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

⚠ WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

⚠ WARNING

Warning indicates potentially hazardous situations for PVC (Polyvinyl Chloride) and CPVC (Clorinated Polyvinyl Chloride) piping in chilled water systems. In the event the pipe is exposed to POE (Polyolester) oil used in the refrigerant system, the pipe can be chemically damaged and pipe failure can occur.

⚠ DANGER

Dangers indicate a hazardous electrical situation which will result in death or serious injury if not avoided.

⚠ DANGER

Dangers indicate a hazardous gas situation which will result in death or serious injury if not avoided.

⚠ NOTICE

Notices give important information concerning a process, procedure, special handling or equipment attributes.

⚠ IMPORTANT

Before unit commissioning, please read this publication in its entirety. Develop a thorough understanding before starting the commissioning procedure.

This manual is to be used by the commissioner as a guide. Each installation is unique, only general topics are covered. The order in which topics are covered may not be those required for the actual commissioning.

This manual provides information on the MicroTech® control system used in the Daikin Applied Unit Ventilator product line. It describes the MicroTech components, input/output configurations, field wiring options and requirements, and service procedures.

For installation and general information on the MicroTech Unit Ventilator Controller, refer to IM 1286, MicroTech Unit Ventilator Controller.

For installation, commissioning instructions, and general information on a particular unit ventilator model, refer to the appropriate manual (Table 1), as well as accompanying software operating instruction manual, and possible accessory manuals that may pertain to the unit (Table 3).

For installation and maintenance instructions on a plug-in communications card, refer to the appropriate protocol-specific installation and maintenance manual. For a description of supported network variables for each protocol, refer to MicroTech Unit Ventilator Unit Controller Protocol Information ED 19110 (Table 2).

Copies of the latest version of these manuals are available for download on our website at www.DaikinApplied.com or from your local Daikin Representative.

Revision History

OM 1280-5	June 2024	Changed CO2 Prop Gain from 1 to 0.1
OM 1280-4	Jan. 2022	Control version 1.5 updates
OM 1280-3	Oct. 2020	Added Deferential DAT reset Modified modulating hot water/steam valves to be reverse acting Added modulating valves for adjustable and reversible control signals Added scaling of F&B damper control signal Added section Disabling Remote Wall Mounted Sensor Adjustment Added section Fan Operation with Compressors Updated UCV Configuration Parameters values Modified Discharge Air Temperature Low Limit DX and Hydronic Water Coil Freeze Fault Alarm
OM 1280-2	Jan. 2020	General revisions
OM 1280	May 2019	Initial release

Table 1: Model-Specific Unit Ventilator Installation Literature

Description	Manual #	AEQ	AHB	AHF	AHR	AHV	ARQ	AVB	AVR	AVS	AVV	AZR	AZU	AZQ	GRQ
Vertical	IM 817							•	•	•	•				
Horizontal	IM 830		•	•	•	•									
Vertical Self-Contained	IM 1065											•	•	•	
Vertical Self-Contained	IM 1082	•													
Vertical Self-Contained	IM 1083						•								•

Table 2: Protocol-Specific Communication Installation Literature and Data

Description	Manual #
MicroTech Unit Ventilator Protocol Information	ED 19110

Table 3: Accessory-Specific Installation Literature

Description	Manual #
MicroTech Unit Ventilator Controller Installation	IM 1286
ServiceTools Operation Manual	OM 732

Acronyms/Abbreviations

The following table list acronyms and abbreviations that may or may not be used within this manual. Other abbreviations for the Local User Interface (LUI) and parameters can be found in Table 24 on page 47.

Table 4: Acronyms and Abbreviations

Description	Acronym/Abr.
Air Fan	AF
Auxiliary Heat End Differential	AHED
Auxiliary Heat Start Differential	AHSD
American Standard Code for Information Interchange	ASCII
American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc	ASHRAE
Compressorized Cooling Lockout	CCLO
Space CO_2 Setpoint	CO2S
Chilled Water	CW
Chilled Water Valve Position	CWVP
Discharge Air	DA
Discharge Air High Limit	DAHL
Discharge Air Temperature	DAT
Discharge Air Temperature Setpoint	DATS
Demand Controlled Ventilation	DCV
DX Cooling Discharge Air Low Limit	DXLL
Defrost Start Setpoint	DSSP
Defrost Reset Setpoint	DRSP
Defrost Time Limit	DTL
Economizer Compare Differential	ECD
Economizer Indoor Air/Outdoor Air Enthalpy Differential	EED
Economizer Outdoor Air Enthalpy Setpoint	EES
Emergency Heat Setpoint	EHS
Exhaust Interlock Outdoor Air Damper Min Position Setpoint	EOAD
Effective Outdoor Air Temperature	EOAT
End-of-Cycle	EOC
End Of Cycle Outdoor Air Temperature Low Setpoint	EOCS
Outdoor Air Humidity Output	EORH
Space Humidity Output	ERH
Economizer Indoor Air/Outdoor Air Temp Differential	ETD
Economizer Outdoor Air Temp Setpoint	ETS
Source (water in) Temperature	EWIT
Face and Bypass Damper Position	FBDP
Federal Communications Commission	FCC
Face and Bypass	F&BP
Heating, Ventilating, Air Conditioning Refrigeration	HVACR
Heating End Of Cycle Valve Setpoint	HEOC
Hot Water	HW
Indoor Air	IA
Indoor Air Enthalpy	IAE
Indoor Air Fan	IAF
Indoor Air Temperature	IAT

Description	Acronym/Abr.
Light Emitting Diode	LED
Local User Interface	LUI
Mixed Air Low Limit	MALL
Mechanical Cooling Low Limit Setpoint	MCLL
National Electric Code	NEC
Outside Air	OA
Outdoor Air Coil Temperature	OACT
Outside Air Dampers	OAD
Energize Exhaust Fan Outdoor Air Damper Setpoint	OADE
Outdoor Air Damper Min Position High-Speed Setpoint	OADH
Outdoor Air Damper Min Position Low-Speed Setpoint	OADL
Outdoor Air Damper Min Position Medium Speed Setpoint	OADM
Outdoor Air Damper Position	OADP
Outdoor Air Enthalpy	OAE
Outdoor Air Damper Lockout Setpoint	OALS
Outdoor Air Damper Max Position Setpoint	OAMX
Outside Air Temperature	OAT
Occupied Cooling Setpoint	OCS
Occupied Heating Setpoint	OHS
Occupancy Override Input	OOI
Occupancy Sensor Input	OSI
Proportional Integral	PI
Parts Per Million	PPM
Relative Humidity	RH
Space Humidity Setpoint	RHS
Read Only	RO
Read Write	RW
Standby Cooling Setpoint	SCS
Standby Heating Setpoint	SHS
Thermal Expansion Valve	TXV
Unoccupied Cooling Setpoint	UCS
Unoccupied Heating Setpoint	UHS
Unit Ventilator	UV
Unit Ventilator Controller	UVC
Unit Ventilator Controller (Heat/Cool) Mode Output	UVCM
Unit Ventilator Controller State Output	UVCS
Wet Heat Valve Position	VALP
Ventilation Cooling Low Limit Setpoint	VCLL
Ventilation Cooling Lockout	VCLO
Ventilation Cooling Setpoint	VCS
Wet Heat	WH
Source (water in) Temperature Differential	WITD

Local User Interface (LUI) Keypad

The MicroTech Local User Interface (LUI) is a self-contained device that is capable of complete, stand-alone operation. The UVC must be loaded with Application 01.02 or higher for proper LUI operation. Consult OM 732 for details. Control parameters and the network are accessible through the LUI keypad. The following sections describe how to use the keypad.

Display Format

The LUI features a 4 × 20 OLED digital display, 6 keys, and 2 individual LED indicators. In addition to the operating mode states and fan functions, the LUI will digitally display:

- The room setpoint temperature
- The current room temperature
- Any fault code for quick diagnostics at the unit

Figure 1: Local User Interface (LUI)

Using the LUI Keypad

The LUI shown in Figure 1 is optional on Daikin Applied Unit Ventilators provided with MicroTech controls. Using the keypad on the LUI, operating conditions, system alarms, and control parameters can be monitored. Setpoints and other parameters can also be modified.

NOTE: The shared LUI keypad and network variables have a "last change-wins" relationship.

Keypad Functions

Button Functionality

- **Home:** Brings the user to the home menu screen
- **On/Stop:** Toggles the On/Stop command to the main controller board
- ▲: Moves the selection cursor UP in the list of menu items. Alternatively, this button increases a parameter value when in the parameter adjustment screen
- ▼: Moves the selection cursor DOWN in the list of menu items. Alternatively, this button decreases a parameter value when in the parameter adjustment screen
- **Back:** Returns the user to the previous menu. If current menu is the "Live" menu, then pressing this button will go to the password screen. Further presses of this button toggle between the "Live" menu and the "Password" screen
- **Enter:** Commits the user's choice. If the user is navigating the menu structure, this button processes the selection and either displays to the appropriate referenced menu or displays the appropriate parameter to be changed. If the user is currently making a change to a parameter, pressing this button will "commit" the change and send the new value to the main controller board with the "Set Parameter" command

LEDs

- **STATUS (Green)**
  - Green LED ON = Unit is run enabled.
  - Green LED OFF = Unit is in the OFF Mode. NOTE: Unit is still powered in the OFF Mode.
- **ALARMS:**
  - Red LED ON = The unit is in an active alarm state. These are listed by accessing the "**Active Alarms**" on the LUI
  - Red LED OFF = No active alarms.

Keypad Navigation

Help Text

Pressing 'Enter' on any non-menu point will bring you to the 'Help Text' that provides a more extensive description.

Writable Points

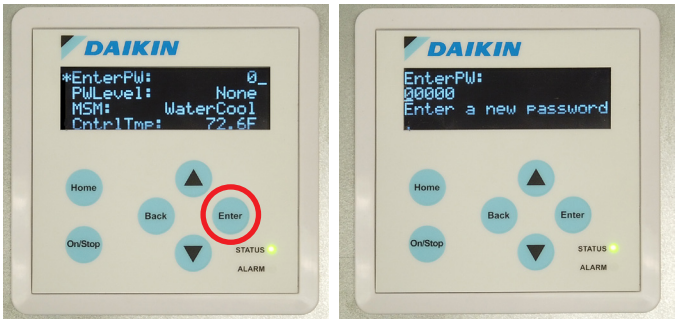
An '*' before any non-menu points indicates that the value of that point can be changed through the keypad by pressing 'Enter' on that point, assuming that the correct level of password has been entered.

'TXT' Values

A value of 'TXT' for any non-menu point indicates that pressing 'Enter' when the cursor is on that point will bring up a text description of the present value of that point, such as the full text description of an alarm

Entering Password

1. Select correct password from (Table 5).
2. Press **HOME** button
3. Press **ENTER** button twice. “00000” will be displayed.

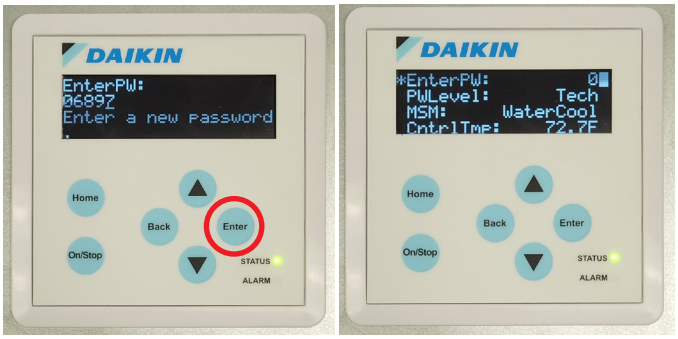


4. Use the ▲ key to change the numeric value and use the **ENTER** button to advance to the right one character.

   a. EXAMPLE – Enter Technician Password (06897)
   b. Press **ENTER** to accept “0”
   c. Press ▲ 6 times to change value from “0” to “6”.
   d. Press **ENTER** to accept and shift to next digit.
   e. Press ▲ 8 times to change value from “0” to “8”.
   f. Press **ENTER** to accept and shift to next digit.

NOTE: If previous value is incorrect or changed use the **BACK** button to revise previously entered value. Change with ▲ ▼ ARROWS and use **ENTER** to accept.

   g. Press ▲ 9 times to change value from “0” to “9”.
   h. Press **ENTER** to accept and shift to next digit.
   i. Press ▲ 7 times to change value from “0” to “7”.
   j. Press **ENTER**. Password will be accepted and “PWLevel” will display as “Tech”.



NOTE: Password must be re-entered if the unit is power cycled or the password times out, whichever occurs first.

Password Levels

The control has 4 levels of user access. Passwords are used to grant level access. Depending on the level of access, certain menus and parameters will be allowed to be read and written. The “Expires After” column defines how long the password is valid without a key press.

The following are the different levels of user access and the password needed for each is shown in Table 5.

Table 5: Control Password Access Levels

Password Level	Password	Expires After	Description
None	–	–	Default. Limited read access. No write access aside from password entry.
User	00068	15 minutes	Limited read and write access to basic high level menus and parameters.
Manager	00689	15 minutes	Read access to all user parameters plus additional menus and parameters. Provides write access to all but offsets and other purely technical parameters.
Technician	06897	8 hours	Access to all menus and parameters except 1) writing factory configurations to internal memory and 2) overriding outputs for factory testing. Used by the certified HVAC technicians in the field.

Note:
It is recommended to contact the Daikin Applied Terminal Systems Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434 for assistance if needed before making changes to unit configuration, setpoints, or network parameters.

Menu Reference

The keypad menu eases troubleshooting and simplifies control configurations. The user can access the most common parameters and system status values without a PC or network interface.

The LUI keypad display menu consists of an array of menus and sub-menus that logically arranges the various parameters that affect the operation of the UVC. Depending on password level the user has the ability to change the value of parameters where applicable.

LUI Navigation

Changing Setpoints

- Press **HOME**
- Use ▼ to place flashing cursor next to “**Set**”
- Press **ENTER** to select this submenu
- Use ▼ to place flashing cursor next to “**Set-Setpoints**”
- Press **ENTER**
- Use ▲ ▼ to place flashing cursor next to the setpoint to be changed
- Press **ENTER**
- Use ▲ ▼ to change value
- Press **ENTER** to accept. Cursor will advance to allow you to change the tenths value (after the decimal whole value)
- Use ▲ ▼ to change value
- Press **ENTER** to accept. Cursor will return to all user adjustable setpoints

Setting Fan Speed

- Press **HOME**
- Use ▼ to place flashing cursor next to “**IndoorFan**”
- Press **ENTER** to select this submenu
- Use ▼ to place flashing cursor next to “**KeyInFan**”
- Press **ENTER** to select
- Use ▲ ▼ to change fan speed (**Auto, Low, Medium, High**)
- Press **ENTER** to select desired speed

Viewing Temperatures

- Press **HOME**
- Use ▼ to place flashing cursor next to “**Temperatures**”
- Press **ENTER** to select this submenu
- Use ▲ ▼ to view values

Setting Time

- Press **HOME**
- Use ▼ to place flashing cursor next to “**Set**”
- Press **ENTER** to select this submenu
- Use ▼ to place flashing cursor next to “**Set-Clock**”
- Press **ENTER**
- Use ▲ ▼ to move flashing cursor next to the a value to modify
- Press **ENTER**
- Use ▲ ▼ to change value
- Use **ENTER** to shift cursor on digit to the right
- Use **BACK** to shift cursor one digit to the left
- Once value is as desired and cursor is flashing on the furthest digit to the right, press **ENTER** to accept and store the value
- Repeat process as needed for other values

Setting Clock/Schedules

- Press **HOME or BACK to return to the "Live" screen**
- Use ▼ to scroll down to "**Set**"
- Press **ENTER** to select
- Use ▼ to scroll to "**Set-Schedule**"
- Press **ENTER to select**
- Use ▲ ▼ to place cursor next to "Set-Sched-Days
- Press **ENTER to select**
- Use ▲ ▼ to place cursor next to select a day to schedule (example "Set-Sched-Days-Sun") and press **ENTER to select**
- Use ▲ ▼ to select (ex "SunOccHr1") and press **ENTER to select**
- Use ▲
- If prompted, enter the **USER PASSWORD (00068)**. If not prompted, skip this step
- Use ▲ ▼ to change value for start of occupied hour (Military Time values from 0-23 are valid)
- Optional – Enter the minutes (0-59 are valid)
- Repeat as necessary for all days of week

NOTE: For multiple occupied and unoccupied time periods, be careful not to over-lap times. All times are entered in military time where 00 is 12:00 AM and 23 is 11:00 PM

Viewing Active Alarms

- Press **HOME**
- Use ▼ to place flashing cursor next to "**Alarms**"
- Press **ENTER** to select this submenu
- Press **ENTER** again to enter the "**Alarms-Active**" to view any alarms currently active
- Press **ENTER** with '**ActiveAlarm**' selected to bring up a text description of the highest priority active alarm

Viewing Alarm History

- Press **HOME**
- Use ▼ to place flashing cursor next to "**Alarms**"
- Press **ENTER** to select this submenu
- Use ▼ to place flashing cursor next to "**Alarms-History**"
- Press **ENTER** to select this submenu
- Press **ENTER** with 'HistoryAlarms' selected to bring up a text description alarms that have occurred previously
  - Active designates when the alarm occurred
  - Inactive designates when the alarm was cleared
  - Use ▲ to view older alarms and use ▼ to view more recent alarms

Clearing Active Alarms

- Press **HOME**
- Use ▼ to place flashing cursor next to "**Set**"
- Press ENTER to select this submenu
- Use ▼ to place flashing cursor next to "**Set-Alarms**"
- Press **ENTER**
- Use ▼ to to place flashing cursor next to "**KeyRstAls**" and
- Press **ENTER**
- Use ▲ to change the value to '**Clear**'
- Press **ENTER** to clear the alarm

NOTE: If the alarm condition still exists the unit will go back into the alarm state

State Programming

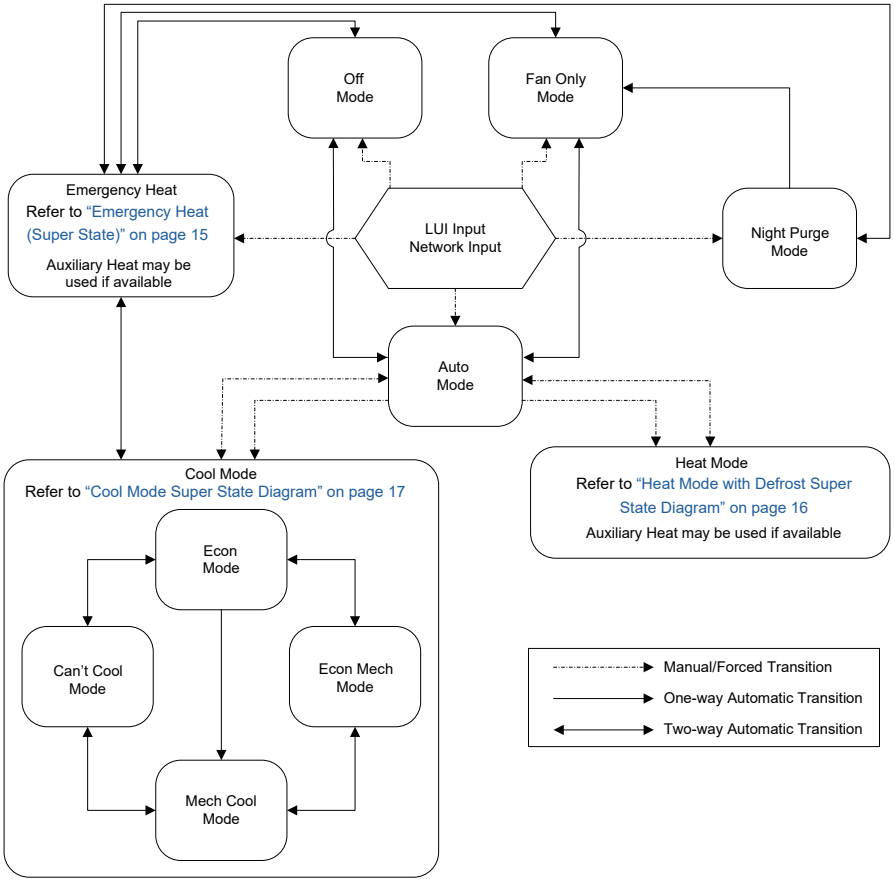
The MicroTech UVC takes advantage of “state” machine programming to define and control unit ventilator operation. A “state” defines a specific mode of operation for each process within the unit ventilator (e.g., heating, cooling, etc.) and contains the specific decision logic and sequence of operation for each mode. This eliminates some of the most common problems associated with control sequences such as the possibility of simultaneous heating and cooling, rapid cycling, etc.

The UVC states and super states are used to define the “normal” unit modes, such as Off, Night Purge, Fan Only, Emergency Heat, Auto, Cool, Heat, and Active Dehumidification. The UVC also supports several “special purpose” unit modes such as Purge, Pressurize, Depressurize, and Shutdown, which can be forced via a network connection and override typical UVC operation.

The state diagrams presented in the following sections consist of several features including super states, states, transition logic and methods of entry to the state. Super states are used as a means to group two or more related states into a single control function. There are three super states: Heating, Cooling and Emergency Heat. The states are where all the actual work takes place. Within each state, the UVC enables PI-loops and other logic sequences required to control unit ventilator operation within that particular state, while other functions and PI-loops not needed during that state may be disabled. The transition logic represents questions used by the UVC to determine which state should be made active. These transition questions are constantly being monitored by the UVC, which allows the unit to switch between modes as it deems is necessary. The possible methods of entry to each state or super state vary. Entry into some states must be forced by an input through the LUI keypad, ServiceTools software, or a network input. Some states will only be entered automatically from a super state or other state, while some can be entered manually or automatically. The unit configuration settings may be changed using available ServiceTools software.

NOTE: Not all states or modes are available for all UV configurations, and some states (such as Active Dehumidification) are optional.

Figure 2: Complete UVC—State Diagram



UVC Unit Modes

The UVC provides several “normal” modes of unit operation. The UVC may be in Off, Occupied, Unoccupied, Standby, or Bypass modes.

Normal UVC modes can contain a single state or several states depending upon the functionality required for each particular mode.

Table 6: UVC State Names

Normal UVC modes		State names
OFF		OFF
Night Purge		Night Purge
Emergency Heat		Full Heat
Auto	Heat	Heat
		Defrost
		Low Limit
	Cool	EconMech
		Mech
		Econ
		MinDAT
		MinDAT Low Limit
	Fan Only	Fan Only

Off Mode

⚠ WARNING

Off mode is a “stop” state for the unit ventilator. It is not a “power OFF” state. Power may still be provided to the unit.

Off mode is provided so that the UVC can be forced into a powered OFF condition. Off mode is a **“**stop**”** state for the unit ventilator; it is not a power OFF state. Off mode consists of a single UVC state: OFF.

When Off mode becomes active, the UVC stops all normal heating, cooling, and ventilation (OA damper is closed), and fan operation ends. The UVC continues to monitor space conditions, indicate faults, and provide network communications (if connected to a network) in the Off mode while power is maintained to the unit.

While in Off mode, the UVC does not maintain DA temperatures. If the space temperature drops below EHS while in the Off mode, the UVC is forced into the Emergency Heat mode (see “Emergency Heat Mode (Super State)” on page 18).

NOTE: Special purpose unit modes such as Purge, Pressurize, and De-pressurize can force the UVC to perform “special” functions during which the display appears to be in the Off mode.

Night Purge Mode

Night Purge mode is provided as a means to more easily and quickly ventilate a space. Night Purge can be useful in helping to remove odor build up at the end of each day, or after cleaning, painting, or other odor generating operations occur within the space. Night Purge mode consists of a single UVC state: Night Purge.

Night Purge is a full ventilation with exhaust mode, during which room comfort is likely to be compromised. Therefore, Daikin strongly recommends using Night Purge only when the space is unoccupied.

When Night Purge mode becomes active, for 1 hour (configurable), the UVC stops all normal heating and cooling. If the UVC is not set to another mode within 1 hour (configurable), the UVC automatically switches to the Fan Only mode (refer to “Fan Only Mode”). Since any new energy used to treat the incoming air would be wasted in the purge process. In the Night Purge mode, the space fan is set to high speed, the OA damper is set to 100% open, and the Exhaust Fan binary output (see “External Binary Outputs” on page 41) is set to ON.

While in Night Purge mode, the UVC does not maintain DA temperatures. If the space temperature drops below the EHS, the UVC is forced into the Emergency Heat mode (see “Emergency Heat Mode (Super State)” on page 18).

Fan Only Mode

The unit will enter Fan Only mode if the control temp is within the deadband created by the effective occupied heating and coolings setpoints. Additionally, the UVC can be forced into a Fan Only operation via a keypad/display or a network connection. Fan only can be entered through heating and cooling and auto. Fan Only mode consists of a single UVC state: Fan Only.

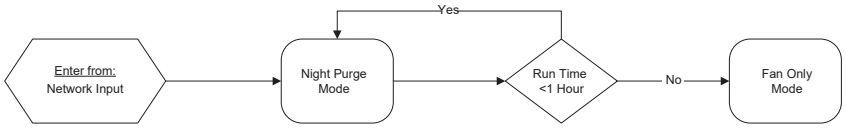
When Fan Only mode becomes active, the UVC stops all normal heating and cooling.

While in Fan Only mode, the UVC does not maintain DA temperatures except to ensure that the DA does not fall below the VCLL or based on the air tempering functionality if enabled. If the space temperature drops below the EHS, the UVC is forced into the Emergency Heat mode (see “Emergency Heat Mode (Super State)” on page 18).

Auto Mode

Auto mode is provided so that the UVC can be set to automatically determine if heating or cooling is required. Auto mode is the default power-up UVC mode. Auto mode is made up of the Heat and Cool mode “super states”. When the UVC is set to auto mode, the UVC automatically determines which mode (Heat or Cool or fan only) to use.

Figure 3: Night Purge State Diagram



Discharge Air Temperature Control

The unit will remain in one of the cooling states, heating state, or fan only/dehumidification state until the control temperature transitions through either the cooling setpoint or heating setpoint. The amount of heating and cooling commanded is based on the discharge air temperature and discharge air temperature setpoint. Cooling and heating stage-up and stage-down commands are based on the discharge air temperature. These commands are one of the parameters used to command different states in the main state machine.

Discharge Air Temperature Resets

An optional discharge air temperature reset can be programmed into the UVC that will automatically adjust the discharge air temperature setpoint based on the control temperature. There are six parameters for heating and cooling respectively.

Control Temperature: Current measured space temperature by a unit mounted room air temperature sensor, a remote mounted wall sensor, or an average of the two (See "Control Temperature" on page 30).

Differential Reset

A differential reset can be programmed into the UVC that will automatically adjust the discharge air temperature setpoint based on a differential from the active heating or cooling setpoints as opposed to fixed setpoint values. With differential resets if the adjusting heating or cooling setpoint though network communications or a local room sensor, will also adjust the control temperature corresponding to the min and max DAT setpoints.

Heating Mode

Default Values:

1. Min DAT HTG Setpoint = 80
2. Max DAT HTG Setpoint = 120
3. Min DAT HTG Ctrl Setpoint = 67
4. Max DAT HTG Ctrl Setpoint = 70
5. Min DAT HTG Diff Setpoint = 0
6. Max DAT HTG Diff Setpoint = 5

Min DAT Htg Setpt: Minimum heating discharge air temperature allowed when unit is in heating mode and the reset is enabled.

Max DAT Htg Setpt: Maximum heating discharge air temperature allowed when unit is in heating mode and the reset is enabled.

Min DAT Htg Ctrl Setpt: Minimum discharge air temperature control value. When the control temperature is less than or equal to MinDAT Ctrl, the DAT Heating value = Max DAT Htg Setpt.

Max DAT Htg Ctrl Setpt: Maximum discharge air temperature control value. When the control temperature is equal to or greater than MaxDAT Ctrl, the DAT Heating value = Min DAT Htg Setpt.

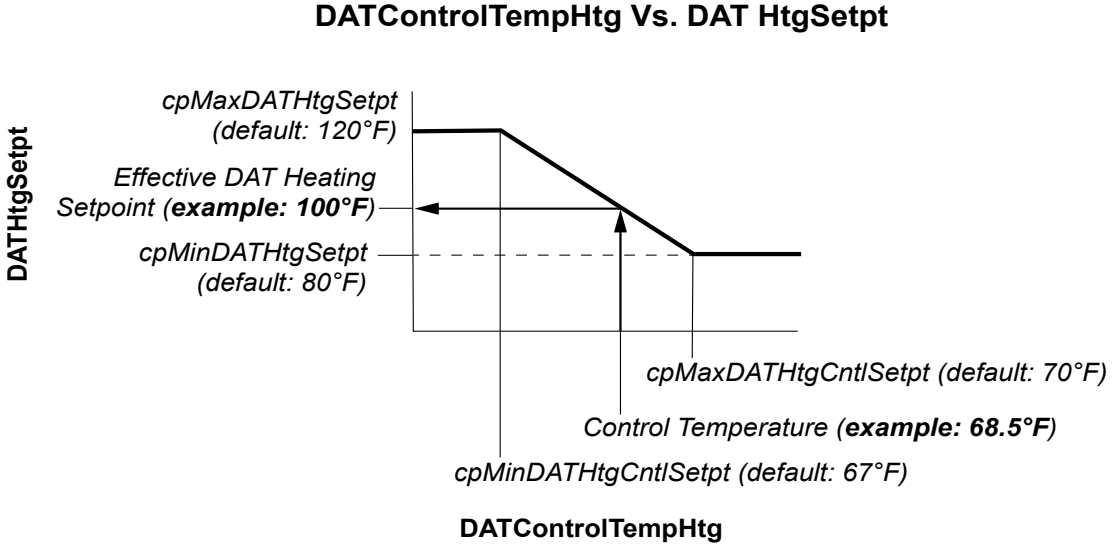
Min DAT Htg Diff Setpt: Minimum discharge air temperature differential value. When the control temperature is less than or equal to the Effective Heat Setpont - MinDAT Diff, the DAT Heating value = Max DAT Htg Setpt.

Max DAT Htg Diff Setpt: Maximum discharge air temperature differential value. When the control temperature is greater than or equal to the Effective Heat Setpont - MaxDAT Diff, the DAT Heating value = Min DAT Htg Setpt.

The unit enters heating mode when the control temperature is below the effective heating setpoint.

If the heating reset is enabled, when the control temperature is between the MinDAT Htg Ctrl Setpt and the MaxDAT Htg Ctrl Setpt, the DAT setpoint will vary linearly between the Max DAT Htg Setpt and Min DAT Htg Setpt values as depicted in Figure 4.

Figure 4: Discharge Air Temperature Heating vs. Discharge Air Temperature Heating Setpoint



Cooling Mode

Default Values:

1. Min DAT CLG Setpoint = 55
2. Max DAT CLG Setpoint = 65
3. Min DAT CLG Ctrl Setpoint = 75
4. Max DAT CLG Ctrl Setpoint = 78
5. Min DAT CLG Diff Setpoint = 0
6. Min DAT CLG Diff Setpoint = 5

Min DAT Clg Setpt: Minimum cooling discharge air temperature allowed when unit is in cooling mode and the reset is enabled.

Max DAT Clg Setpt: Maximum cooling discharge air temperature allowed when unit is in cooling mode and the reset is enabled.

Min DAT Clg Ctrl Setpt: Minimum discharge air temperature control value. When the control temperature is less than or equal to Min DAT Ctrl Setpt, the DAT Cooling value = Max DAT Clg Setpt.

Max DAT Clg Ctrl Setpt: Maximum discharge air temperature control value. When the control temperature is equal to or greater than Max DAT Ctrl Setpt, the DAT Cooling value = Min DAT Clg Setpt.

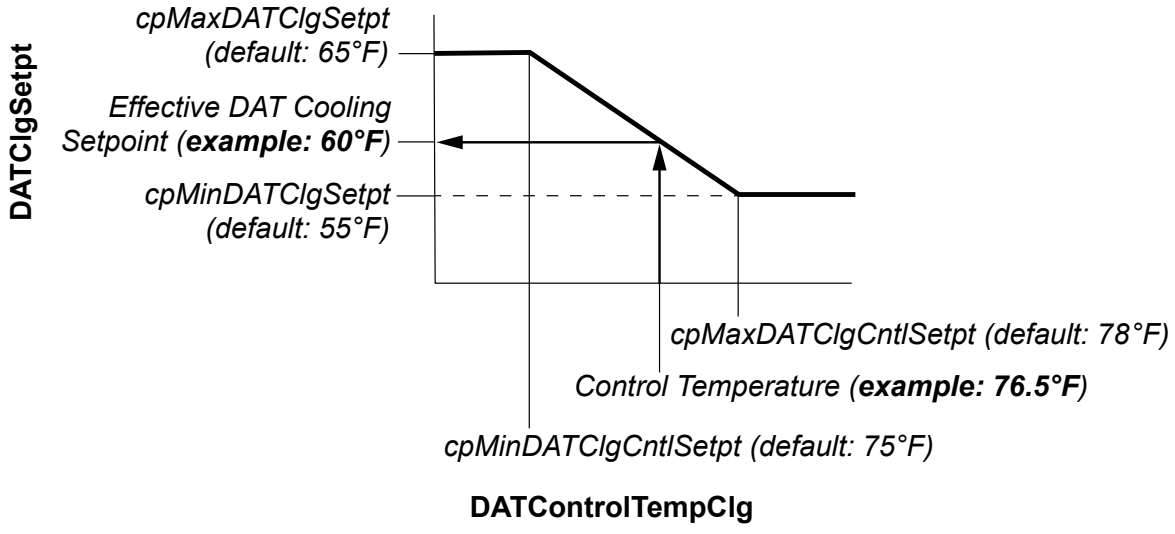
Min DAT Clg Diff Setpt: Minimum discharge air temperature differential value. When the control temperature is less than or equal to the Effective Cool Setpont - MinDAT Diff, the DAT Cooling value = Max DAT Clg Setpt.

Max DAT Clg Diff Setpt: Maximum discharge air temperature differential value. When the control temperature is greater than or equal to the Effective Cool Setpont - MaxDAT Diff, the DAT Cooling value = Min DAT Clg Setpt.

The unit enters cooling mode when the control temperature is above the effective cooling setpoint.

If the cooling reset is enabled, when the control temperature is between the MinDAT Clg Ctrl Setpt and the MaxDAT Clg Ctrl Setpt, the DAT setpoint will vary linearly between the Max DAT Clg Setpt and Min DAT Clg Setpt values as depicted in Figure 5.

Figure 5: Discharge Air Temperature Cooling vs. Discharge Air Temperature Cooling Setpoint



Heat Mode (Super State)

When in Heat mode, the UVC will use primary heat and secondary electric heat (if available) as needed to maintain the effective heating setpoint (see "Effective Setpoint Calculations" on page 31). The keypad/ display or a network connection can be used to force the unit into the Heat mode. Additionally, the UVC when set to Auto mode can automatically force the unit into the Heat mode as needed.

The Heat mode super state consists of UVC states: Heat, Low Limit, Defrost, and Can't Heat.

When the Heat mode super state becomes active, the UVC automatically determines which of the Heat Mode states to make active based upon the transitions for each state.

Heat State (Mechanical Heating)

The Heat state is the "normal" state during Heat mode. When the Heat state becomes active, the UVC will use primary heat (compressor or hot water/steam) and secondary heat (electric heat) as needed to maintain the current DATS. If no other form of heat is available, the UVC will use electric heat as the primary source of heat. The DAT will not be allowed to go above DAHL. The outdoor air damper will be at minimum position, except if the unit is equipped for CO_2 control. In this case the CO_2 demand controlled ventilation function will be active, (see "CO2 Demand Controlled Ventilation (optional)" on page 37), and the OA damper will be adjusted as needed to maintain the CO_2 setpoint. The UVC will remain in this state until one of the transition out conditions become true, or until one of the super state transition out conditions becomes true.

NOTE: The OAD is considered to be in "alarm" when the OAD is forced below the active minimum position in the Low Limit state. This is not an actual unit "alarm" or "fault" condition, but only a condition used for the purpose of transition arguments.

Electric Heat Control

When using electric heat to maintain the current DATS there is a 30 second interstage timer (default, adjustable that limits how frequently the controller will switch between stages of heat. Additionally the UVC will keep the fan running for at least 60 seconds after the electric heat has shut off to cool down the coils. Following Table 7 the UVC will bring on stages of electric heat based on calculated percent capacity required.

Table 7: Electric Heat Stage Transitions

Heat PI Output	Electric Heat Response
1%	Stage 1 Off
5%	Stage 1 On
35%	Stage 2 Off
45%	Stage 2 On
65%	Stage 3 Off
75%	Stage 3 On

Figure 6: Heat State Operation - Electric Heat

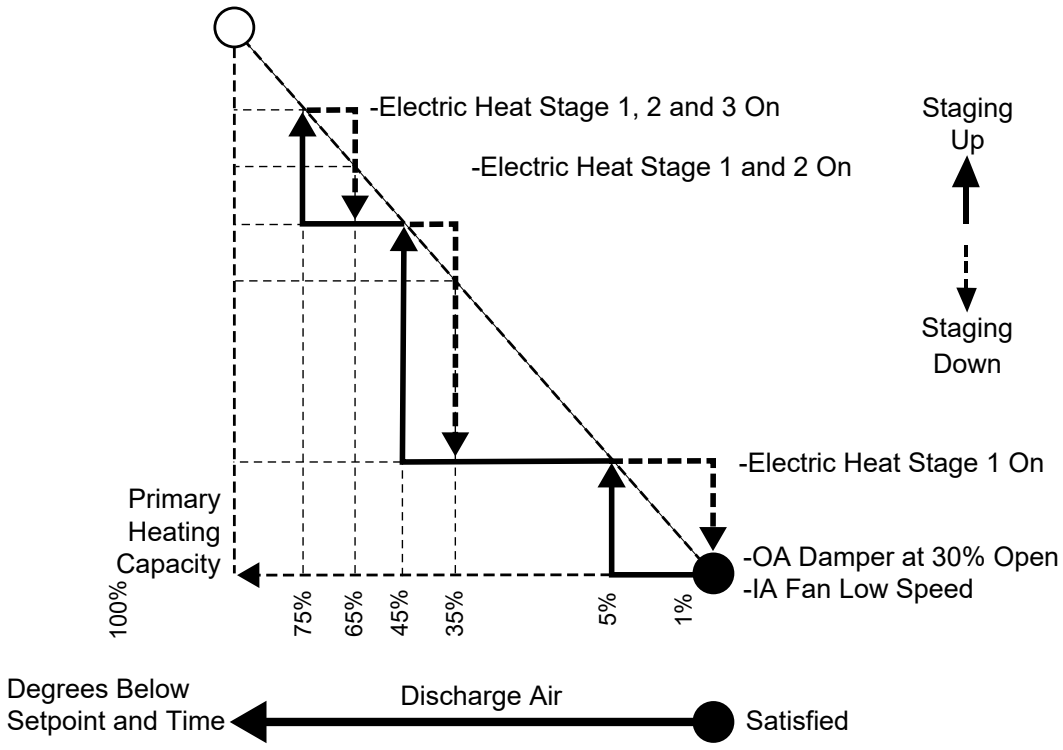
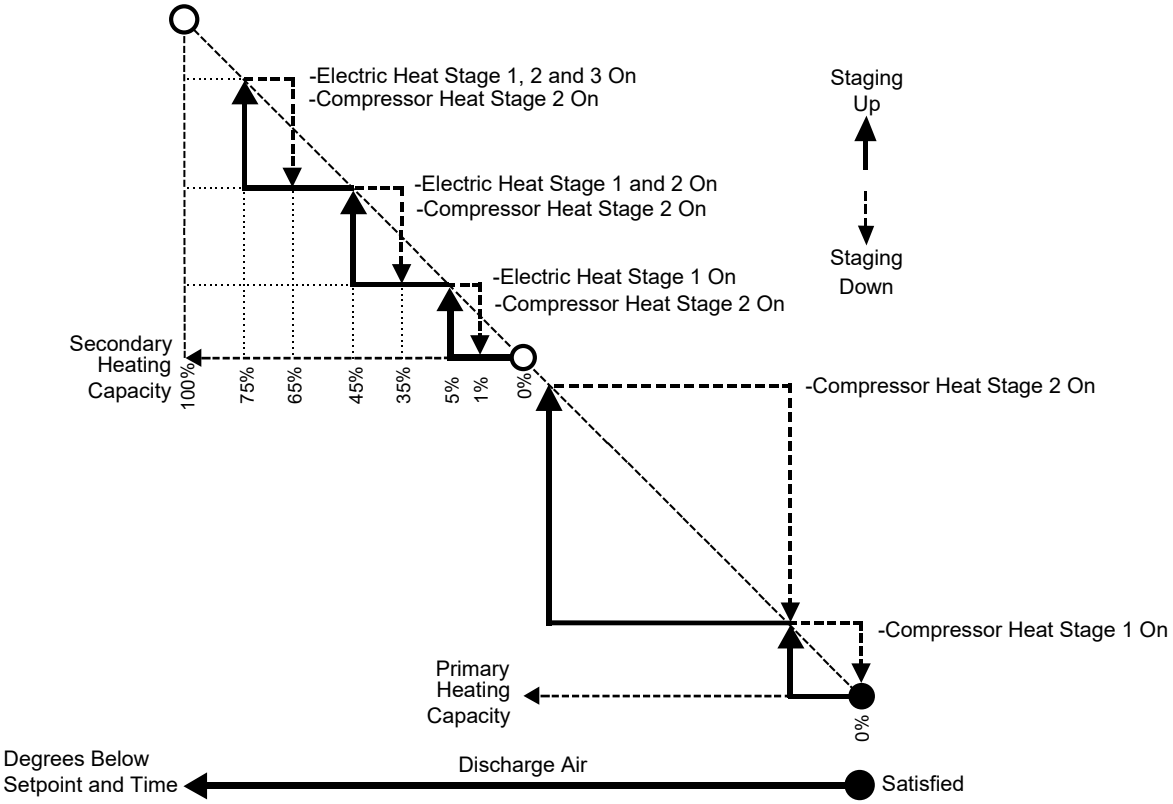


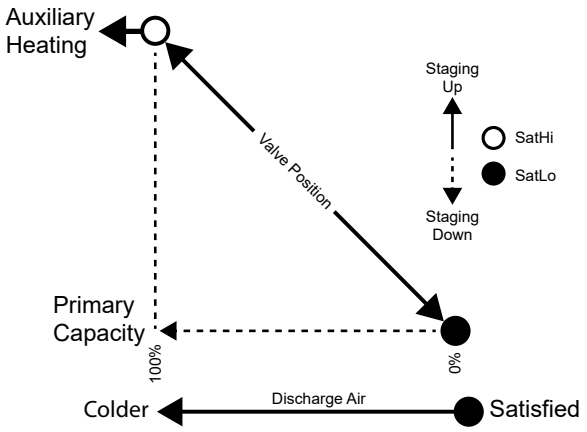
Figure 7: Heat State Operation - Compressor and Electric Heat



Wet Heat Valve Control

If the UVC is configured for a modulating wet heat valve or a modulating chilled water valve both are operated by proportional actuators. The modulating valve actuator contains a spring that ensures that the wet heat valve is open and that the chilled water valve is closed upon loss of power. Each proportional actuator is driven by the UVC using 0-10VDC outputs (scaled to 2-10VDC).

Figure 8: Heat State Operation - Valve Control



The 2-way modulating hot water (or 2-pipe CW/HW) valve is furnished to fail open to the coil. 24VAC is required to power the valve actuator. When the actuator is powered, a controller will provide a 2-10VDC signal to the actuator. A signal of 2VDC or less will drive the valve open; the valve will drive closed as the signal increases to a maximum of 10VDC. These signals can be adjusted or reversed through the LUI keypad or ServiceTools software.

If 24VAC is lost to the actuator, valve will spring-return to its fail position (open to the coil for hot water or 2-pipe CW/HW valves).

The 3-way modulating hot water (or 2-pipe CW/HW) valve is furnished to fail open to the coil. 24VAC is required to power the valve actuator. When the actuator is powered, a controller will provide a 2-10VDC signal to the actuator. A signal of 2VDC or less will drive the valve open (flow through the coil); the valve will drive closed as the signal increases to a maximum of 10VDC (bypassing the coil). These signals can be adjusted or reversed through the LUI keypad or ServiceTools software.

If 24VAC is lost to the actuator, valve will spring-return to its fail position (open to the coil for Hot Water or 2-Pipe HW/CH water valves).

The 2-way modulating steam valve is furnished to fail open to the coil. 24VAC is required to power the valve actuator. When the actuator is powered, a controller will provide a 2-10VDC signal to the actuator. A signal of 2VDC or less will drive the valve open; the valve will drive closed as the signal increases to a maximum of 10VDC. These signals can be adjusted or reversed through the LUI keypad or ServiceTools software.

If 24VAC is lost to the actuator, valve will spring-return to its fail position (open to the coil for steam valves).

Wet Heat Face and Bypass Damper and End-of-Cycle Valve Control

⚠ CAUTION

Both a wet-heat end-of-cycle (EOC) valve and a chilled water end-of-cycle (EOC) valve are strongly recommended by Daikin. If an EOC valve is not installed, it is likely that over-heating or over-cooling of the space will occur.

⚠ CAUTION

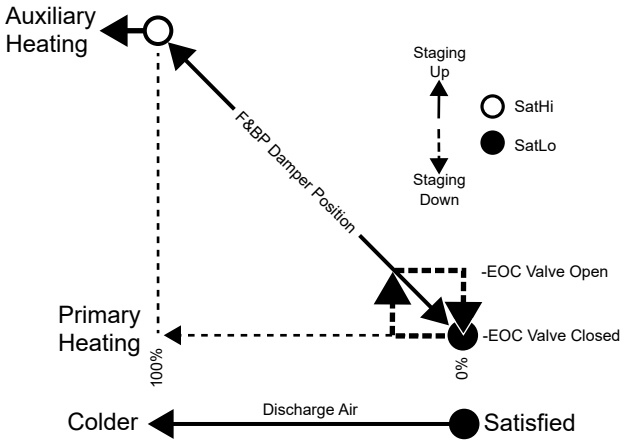
An end-of-cycle (EOC) valve is required for DX units with hydronic heat and F&BP dampers units since the wet coil and the refrigerant coil share the same air path. If an EOC valve is not installed, overheating of the space can occur.

The UVC can be configured for a two-position, normally-open wet heat end-of-cycle (EOC) valve and/or a two-position, normally closed chilled water end-of-cycle valve. The two-position valve actuators contain springs that ensures that the wet heat valve is open and the chilled water valve is closed upon loss of power. The two-position actuators are driven by the UVC using one binary output per actuator.

Face and Bypass (F&BP) dampers are used in conjunction with 2 or 3 way End of Cycle (EOC) valves. The UVC is configured for a face and bypass damper operated by a proportional actuator. The proportional actuator is driven by the UVC using a 0-10 VDC output (scaled to 2-6VDC for vertical configurations and 2-8VDC for horizontal configurations).

When the F&BP damper is used with an EOC valve, the F&BP damper maintains the DATS. When there is no call for hydronic heating, the EOC valve will isolate water flow unless there is a Valve Freeze Protect condition, in which case the valve will go full open and the F&BP damper will be used to maintain the control temperature.

Figure 9: Heat State Operation Face & Bypass Heating



End-Of-Cycle Valve Interlock with Low Outside Air Temperature

If the OA temperature is less than or equal to 34°F (default, adjustable) and the F&BP damper is in full bypass position, the EOC will be open. In this condition the EOC valve will remain open until the OA temperature rises above 34°F (default, adjustable) plus a fixed 1.8°F OA temperature differential, or there's a call for cooling that moves the F&BP damper out of the full bypass position.

Defrost State – Air-Source Heat Pump Only

The Defrost state is a "normal" state that the UVC can go into while heat mode is active.

When defrost is required, the UVC uses active defrost by placing the reversing valve into cooling mode for 4 minutes (default, adjustable 3-5 minutes) during which the unit's electric heaters are used for any space heating requirements. See Figure 11 on page 19

When the unit's evaporator temperature (outdoor coil during heating) becomes equal to or less than the defrost setpoint, and the compressor has been running heating for longer than the Defrost Check Time the unit active defrost begins. When active defrost begins, the OA fan de-energizes, the compressor is commanded to stage 2, and the reversing valve switches to the cooling mode and the OA fan remains de-energized until the outdoor coil temperature (condenser) rises above the defrost setpoint plus Defrost Temperature Differential.

When the Defrost state becomes active, the UVC will use secondary heat (electric heat) as needed to maintain the current DATS. The Heat Timer (3-minutes fixed) will begin counting. The DATS will not be allowed to go above DAHL. The CO_2 demand controlled ventilation function will be active, if the unit is equipped for CO_2 control (see "CO_2 Demand Controlled Ventilation (optional)" on page 37), and the OA damper will be adjusted as needed to maintain the CO_2 setpoint. The UVC will remain in this state until one of the transition out conditions become true, or until one of the super state transition out conditions becomes true.

Defrost State – Water Source Heat Pump Only

The Defrost state is a "normal" state that the UVC can go into while Heat mode is active.

WSHP UV will be allowed to enter the defrost mode twice in a 7 day period, and upon entering the defrost mode a 3rd time in that 7 day period, it will be locked out on a low suction temperature alarm and require a manual reset to resume operation. See Figure 11 on page 19

When defrost is required, the UVC uses active defrost by placing the reversing valve into cooling mode for 1 minute (default) during which the unit's electric heaters are used for any space heating requirements.

When the unit's suction refrigerant temperature becomes equal to or less than the Low Suction Line Temperature setpoint, active defrost begins. When active defrost begins, the compressor is commanded to stage 2, and the reversing valve switches to the cooling mode until the suction refrigerant temperature rises above the Low Suction Line Temperature setpoint plus Defrost Temperature Differential. The Defrost state becomes active, if available the UVC will use secondary heat (electric heat) as needed to maintain the current DATS. The DATS will not be allowed to go above DAHL. The CO_2 demand controlled ventilation function will be active, if the unit is equipped for CO_2 control (see "CO_2 Demand Controlled Ventilation (optional)" on page 37), and the OA damper will be adjusted as needed to maintain the CO_2 setpoint. The UVC will remain in this state until one of the transition out conditions become true, or until one of the super state transition out conditions becomes true. If the suction temperature is below the low suction temperature setpoint (default 28ºF) after the defrost timer has expired, the unit will exit defrost mode and display Low Suction Temp Alarm.

Low Limit State

The Low Limit state is a "non-normal" state the UVC can go into while Heat mode is active when the unit reaches 100% heating and still cannot meet the VCLL. This is likely to occur only if the OA temperature is very cold, the OA damper minimum position is set too high, the unit ventilator is oversized for the application, or if the heating has failed, or is set incorrectly.

When the Low Limit state becomes active, the heating output is set to 100% capacity and the Low Limit can override the OA damper position (see "Outdoor Air Damper Operation" on page 35) and adjust the OA damper toward closed as necessary to maintain the VCLL.

Emergency Heat Mode (Super State)

The Emergency Heat mode is provided for situations where the UVC is in a mode that does not normally allow heating, such as Off, Cool, Night Purge, or Fan Only. If Emergency Heat mode is enabled, the UVC can automatically force itself into the Emergency Heat mode from Off, Cool, Night Purge, Fan Only, Purge, Pressurize, De-pressurize, and Shutdown. Units with two-pipe chilled water configuration do not have primary or secondary heating devices. In the event that the Emergency Heat mode is entered the UVC will use auxiliary heat if available. See "Auxiliary Heat Signal" on page 41.

Full Heat State

The Full Heat state is the "normal" state that the UVC goes into when Emergency Heat mode is active. It is activated when the space temperature is lower than the EHS. When Emergency Heat mode becomes active, the UVC goes into 100% heating until the space temperature raises to the EHS plus a fixed differential. In the Emergency Heat mode, the space fan is set to high speed, and the OA damper closes. If the UVC automatically forces itself into the Emergency Heat mode from another mode (e.g., Cool, Fan Only, etc.), then the UVC returns to the appropriate unit mode once the space temperature rises to the EHS plus a fixed differential.

The UVC monitors the DAT to ensure it does not exceed DAHL. If the DAT does exceed DAHL, then heating is set to 0% for a minimum of 2-minutes (fixed) and until the DAT drops 18°F (10°C) fixed differential below DAHL.

Figure 10: Emergency Heat (Super State)

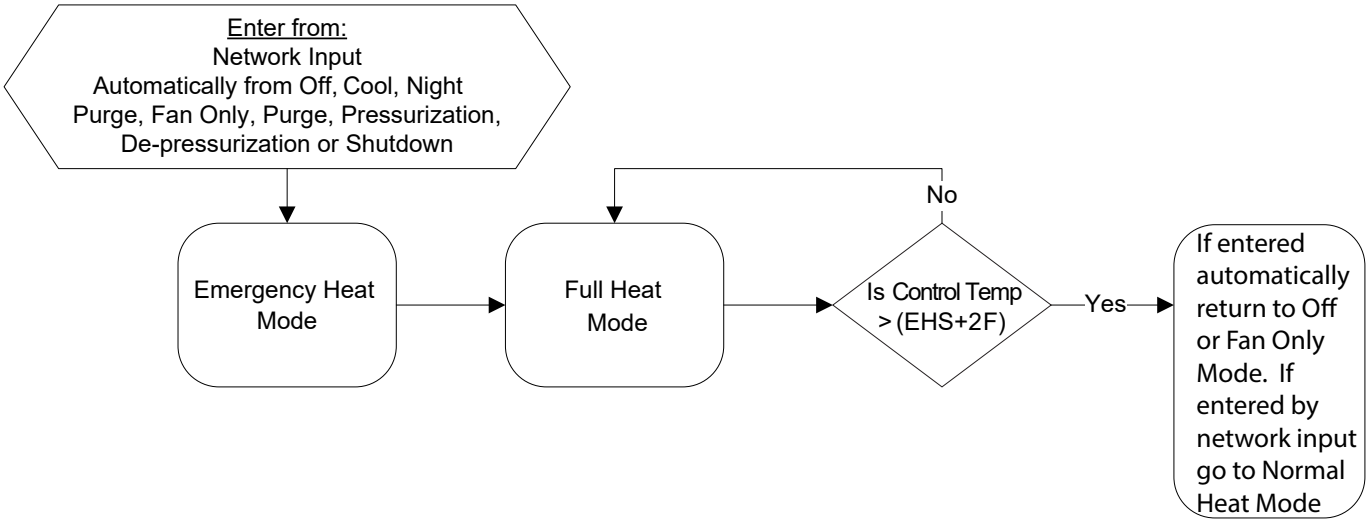
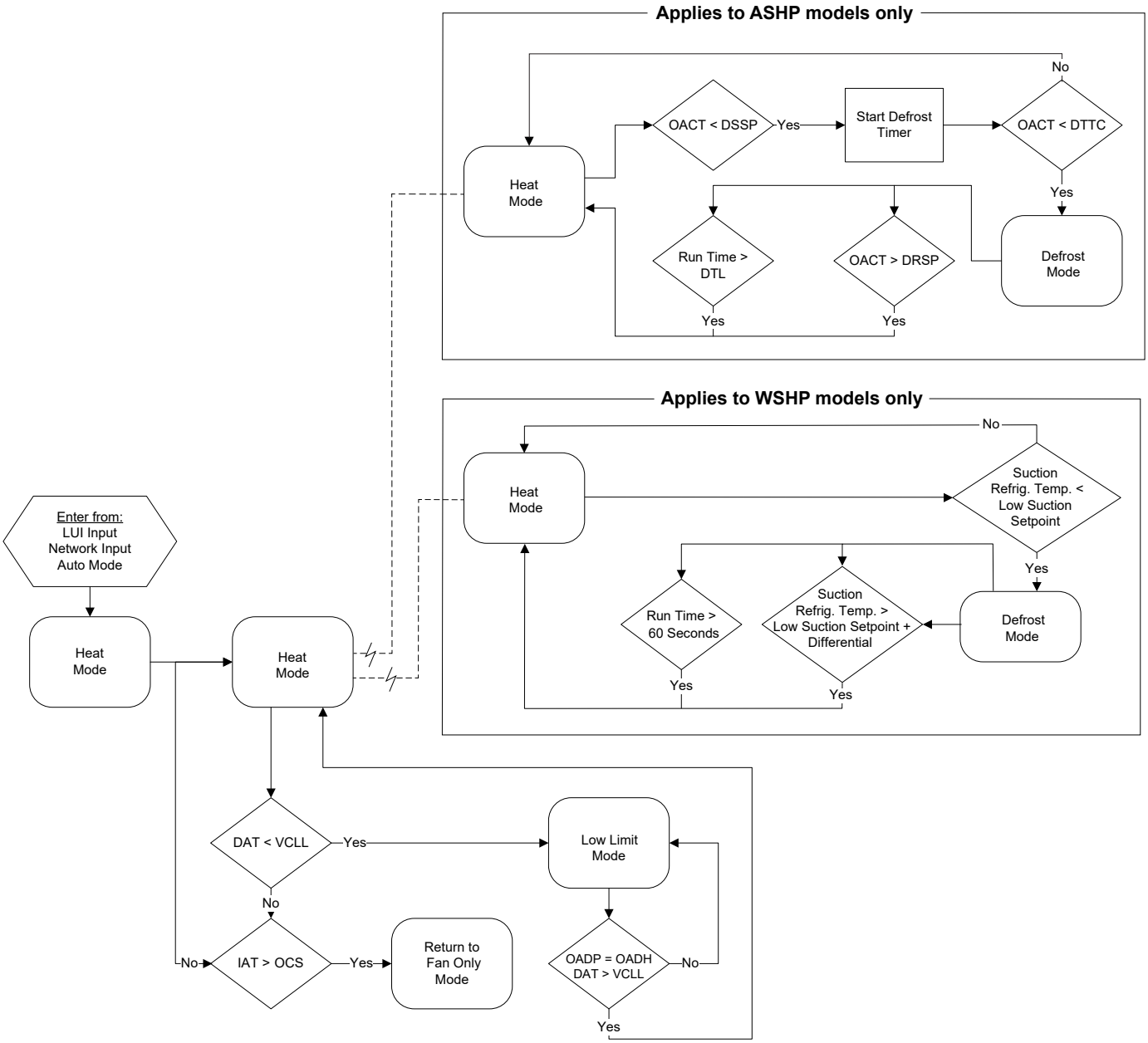


Figure 11: Heat Mode with Defrost Super State Diagram



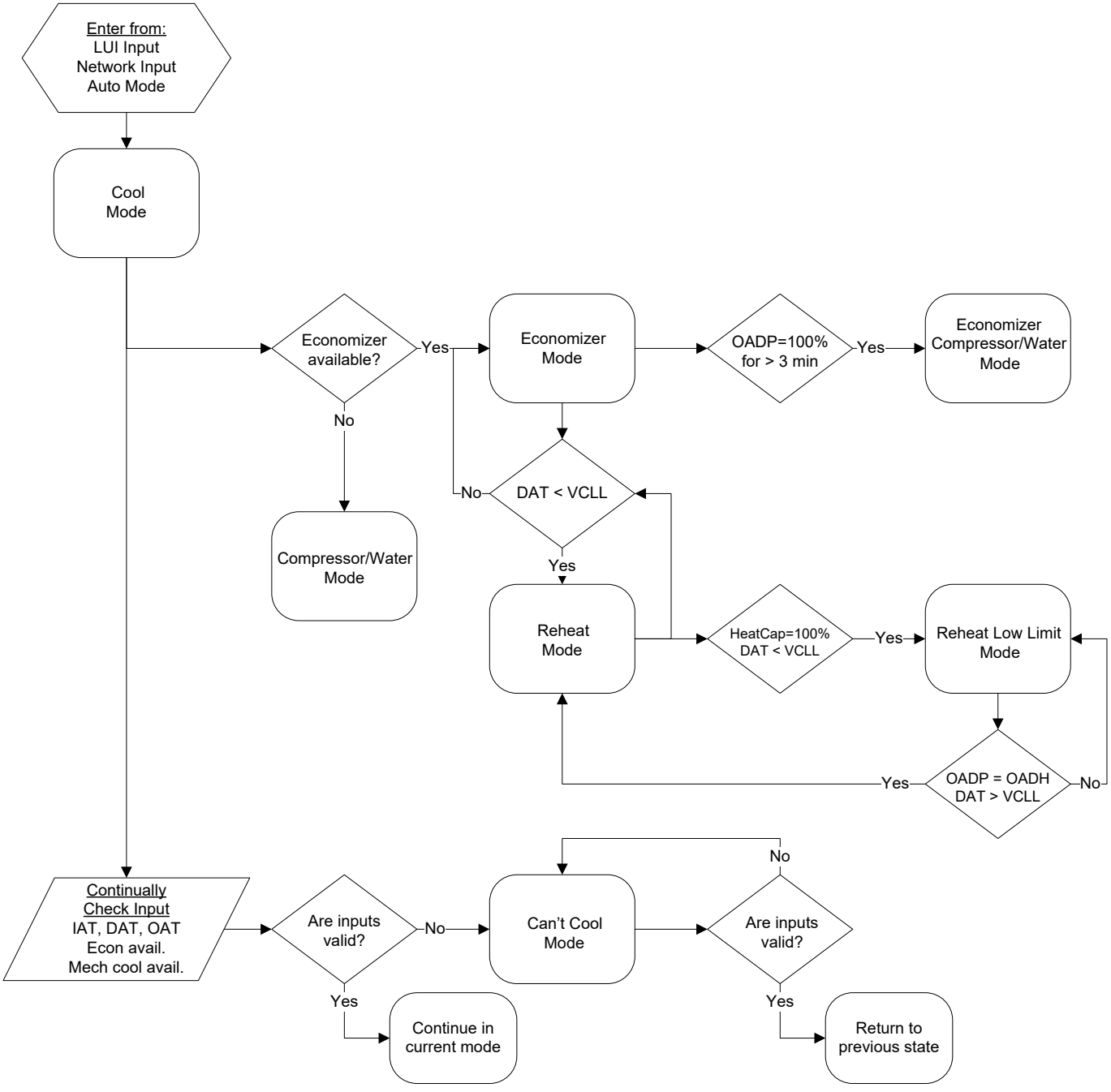
Cool Mode (Super State)

When in Cool mode the UVC uses primary cooling (economizer) and secondary cooling (mechanical, hydronic) as needed to maintain the effective DATS (see "Effective Setpoint Calculations" on page 31). The keypad/display or network connection can be used to force the unit into the Cool mode. The Cool mode super state consists of the following UVC states: CompCool#1, CompCool#2, EconComp#1, EconComp#2, Water Cool, Air Econo Water, Air Econo, Reheat, Reheat Low Limit, and Can't Cool.

When the Cool mode super state becomes active, the UVC will automatically determine which UVC state to make active based upon the transitions for each state.

If the space temperature drops below EHS, and the Emergency Heat function is enabled, the UVC will be forced into the Emergency Heat mode (see "Emergency Heat Mode (Super State)" on page 18).

Figure 12: Cool Mode Super State Diagram



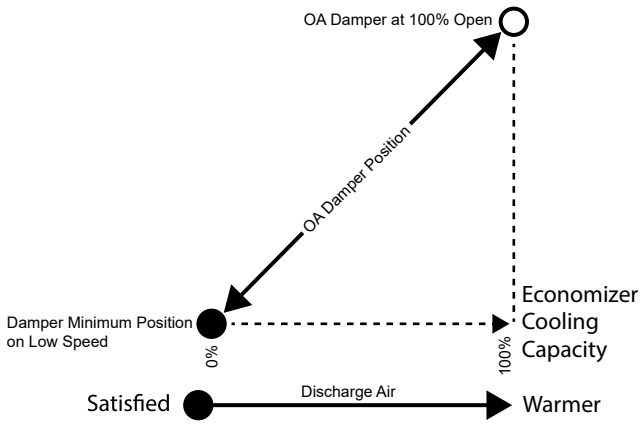
Economizer State

The Economizer state is a “normal” state during Cool mode. The Economizer state typically is active in the Cool mode when primary cooling (economizer) is available and adequate to meet the cooling requirements.

When the Economizer state becomes active, the UVC will (within State) use economizer cooling to maintain the DATS, (see “Night Purge State Diagram” on page 11). The DATS will not be allowed to go below VCLL. If the economizer position reaches 100% outside air and cannot satisfy the DATS after a period of 3 minutes the unit will enter the Econ Comp/Water State.

The UVC monitors the DAT to ensure it does not fall below VCLL. If the DAT does fall below VCLL the unit will enter the DA Reheat state (see “Chilled Water Valve Control” on page 22). The CO_2 demand controlled ventilation function (optional) will be active and the OA damper is adjusted as needed to maintain the CO_2 setpoint. See “CO_2 Demand Controlled Ventilation (optional)” on page 37)

Figure 13: Cool State Operation - Economizer Control



Economizer Compressor/Water

The Econo Comp/Water state is a “normal” state during Cool mode. The Econo Comp/Water state typically is active in the Cool mode when primary cooling (economizer) alone is not adequate to meet the cooling requirements and both primary cooling and secondary cooling (compressor, or hydronic depending on unit configuration) are available.

When the Econo Comp/Water state becomes active, the OA damper is set to 100% open, and the UVC uses the unit’s mechanical cooling capabilities as needed to maintain the DATS.

The UVC monitors the DAT to ensure it does not fall below MCLL.

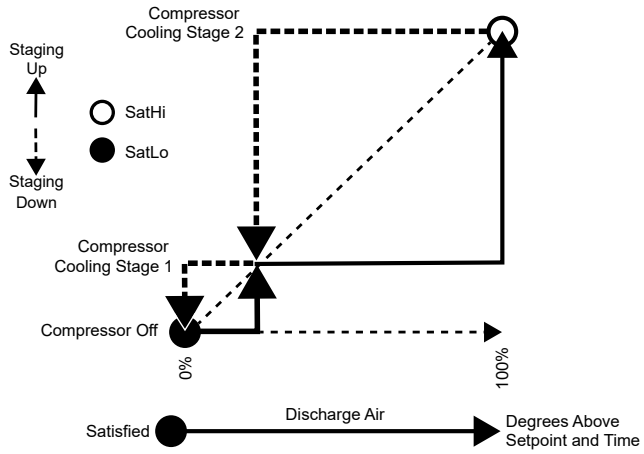
Compressor/Water State

The Compressor/Water state is a “normal” state during Cool mode. The Compressor/Water state typically is active in the Cool mode when primary cooling (economizer) is not available.

When the Compressor/Water state becomes active, the UVC will use secondary cooling (compressor, or hydronic depending on unit configuration) to maintain the DATS, (see “Night Purge State Diagram” on page 11).The DATS will not be allowed to go below MCLL.

The CO_2 demand controlled ventilation function (optional) is active and the OA damper is adjusted as needed to maintain the CO_2 setpoint. See “CO_2 Demand Controlled Ventilation (optional)” on page 37).

Figure 14: Cool State Operation - Compressor Control



DX Split System Cooling

When DX Cooling is active, the UVC will enable the output for the external air cooled condensing unit. If a compressor fault occurs, the condensing unit signal will de-energize and the fault relay will energize.

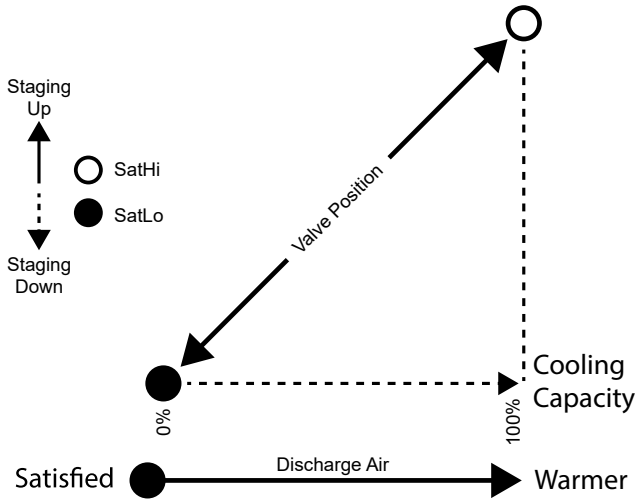
A compressor fault occurs when:

1. The DX high pressure switch opens. Reset will automatically occur twice in a 7 day period with a third occurrence requiring a manual reset of the alarm through a remote temperature sensor, LUI keypad, network communications, or a power cycle.
2. The low suction line temperature sensor detects the refrigerant temperature is too cold. The condensing unit will remain off but the indoor fan will continue to operate for six (6) minutes. After this time period if cooling is called, the condenser signal will energize. Reset will automatically occur twice in a 7 day period with a third occurrence requiring a manual reset of the alarm through a remote temperature sensor, LUI keypad, network communications, or a power cycle.

Chilled Water Valve Control

If the UVC is configured for a modulating chilled water valve, it is operated by a proportional actuator. The modulating valve actuator contains a spring that ensures that the chilled water valve is closed upon loss of power. Each proportional actuator is driven by the UVC using 0-10VDC outputs (scaled to 2-10VDC).

Figure 15: Cool State Operation - Valve Control



The 2-way modulating chilled water valve is furnished to fail closed to the coil. 24VAC is required to power the valve actuator. When the actuator is powered, a controller will provide a 2-10VDC signal to the actuator. A signal of 2VDC or less will drive the valve closed; the valve will drive open as the signal increases to a maximum of 10VDC by default. These signals can be adjusted or reversed using the LUI keypad or ServiceTools software.

If 24VAC is lost to the actuator, valve will spring-return to its fail position (closed to the coil for chilled water valves).

The 3-way modulating chilled water valve is furnished to fail closed to the coil. 24VAC is required to power the valve actuator. When the actuator is powered, a controller will provide a 2-10VDC signal to the actuator. A signal of 2VDC or less will drive the valve closed (bypassing coil); the valve will drive open as the signal increases to a maximum of 10VDC (flow through the coil).

If 24VAC is lost to the actuator, valve will spring-return to its fail position (closed to the coil for chilled water valves, full bypass around the coil).

Chilled Water Face and Bypass Damper and End of Cycle Valve Control

⚠ CAUTION

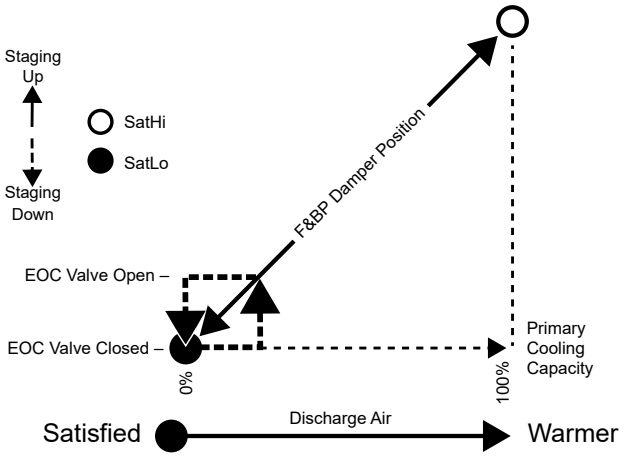
Both a wet-heat end-of-cycle (EOC) valve and a chilled water end-of-cycle (EOC) valve are strongly recommended by Daikin. If an EOC valve is not installed, it is likely that over-heating or over-cooling of the space will occur.

The UVC can be configured for a two-position, normally-open wet heat end-of-cycle (EOC) valve and/or a two-position, normally closed chilled water end-of-cycle valve. The two-position valve actuators contain springs that ensures that the wet heat valve is open and the chilled water valve is closed upon loss of power. The two-position actuators are driven by the UVC using one binary output per actuator.

Face and Bypass (F&BP) dampers are used in conjunction with 2 or 3 way End of Cycle (EOC) valves. The UVC is configured for a face and bypass damper operated by a proportional actuator. The proportional actuator is driven by the UVC using a 0-10VDC output (scaled to 2-6VDC for vertical configurations and 2-8VDC for horizontal configurations).

When the F&BP damper is used with an EOC valve, the F&BP damper maintains the DATS. When there is no call for hydronic cooling, the EOC valve will isolate water flow unless there is a Valve Freeze Protect condition, in which case the valve will go full open and the F&BP damper will be used to maintain the control temperature.

Figure 16: Cool State Operation – Face and Bypass Damper Control



Minimum DAT State

The MinDAT state is a “normal” state during Cool mode. The MinDAT state typically is active when reheat is required to maintain DATS during the Economizer mode, while maintaining the required minimum OA damper position. The MinDAT state can also be made active if the optional CO_2 DCV feature is provided and CO_2 levels are high, requiring the OA damper to open beyond what is required for economizer cooling.

When MinDAT state is active, the UVC uses the unit’s heating capability as needed to maintain Reheat DATS. The CO_2 DCV function (optional) is active and the OA damper is adjusted as needed to maintain the CO_2 setpoint. See “CO2 Demand Controlled Ventilation (optional)” on page 37).

MinDAT Low Limit State

The MinDAT Low Limit state is a “non-normal” state during Cool mode. The MinDAT Low Limit state typically follows the Reheat state when heat is unavailable or when the UVC reaches 100% heat and still cannot maintain VCLL.

When the Low Limit state becomes active, the heating output is set to 100% capacity and the Low Limit logic overrides the OAD minimum position and adjusts the OAD toward closed as necessary to maintain the DAT setpoint (see ”Outdoor Air Damper Operation” on page 35) and “Night Purge State Diagram” on page 11.

Can’t Cool State

The Can’t Cool state is a “non-normal” state during Cool mode. The Can’t Cool state typically becomes active when primary (economizer) and secondary (mechanical, hydronic) cooling is not available (or disabled) or when an IAT, DAT or OAT sensor failure occurs.

When the Can’t Cool state becomes active, no cooling is available.

Air Tempering Mode

The Air Tempering mode is a “normal” state that the UVC can go into when the Fan Only mode is active (the control temperature is between the heating and cooling setpoints and all heating/cooling is off), some form of heating is available, and Air Tempering has been enabled using the LUI keypad or ServiceTools software. The UVC will monitor the DAT during Fan Only mode and if the DAT drops below the effective heating setpoint minus the Air Tempering Mode Differential (default 5.0°F/2.78°C) the unit will use whatever heating is available to reheat the DAT to the effective occupied heating setpoint.

Dehumidification Mode

The following unit configurations are capable of dehumidification as noted:

1. Air Source Heat Pump with Electric Heat.[1]
2. Water Source Heat Pump with Electric Heat.[1]
3. Water Source Heat Pump without Electric Heat.[2]
4. DX Cooling with Electric Heat.[1]
5. DX Cooling with Hydronic Heat (Valve Control).[1]
6. 2-Pipe Chilled Water Cooling and Hot Water Heating (Face and Bypass).[2]
7. 4-Pipe Chilled Water Cooling and Hot Water or Steam Heating (Valve Control).[1]
8. 4-Pipe Chilled Water Cooling and Hot Water or Steam Heating (Face and Bypass).[2]
9. 2-Pipe Chilled Water Cooling and Electric Heating (Valve Control).[1]
10. 2-Pipe Chilled Water Cooling and Electric Heating (Face and Bypass).[1]
11. 2-Pipe Chilled Water Cooling (Face and Bypass).[2]

Note References:

1. Active dehumidification is available ONLY on these configurations. The unit may only enter dehumidification when the unit is in the Cooling super state, and the unit will enter the dehumidification state when the space RH is above the space RH setpoint or the Dehumidification binary input is closed.
2. Passive Dehumidification ONLY.

Passive Dehumidification State (Optional)

The term “passive dehumidification” is meant to convey that “reheat” is not used as part of the dehumidification process. A space humidity sensor or network input is required in order to utilize passive dehumidification. When humidity is high, and when the UVC is in the fan only mode, and the source (water-in) temperature is acceptable for cooling, the UVC uses passive dehumidification.

During passive dehumidification, the UVC uses the Passive Dehumidification F&BP Damper Max setting to restrict the F&BP damper from opening the coil face greater than 20%-face (default); the space fan remains in medium speed during cooling. Unless the indoor coil/suction refrigerant temperature drops below 32°F at which point the fan speed will increase to high. The UVC uses a 5% RH fixed differential below the RHS to determine when passive dehumidification is complete.

Active Dehumidification State (Optional with Reheat Units)

The Active Dehumidification state is a “normal” state that the UVC can go into when the Fan Only mode is active (the control temperature is between the heating and cooling setpoints and all heating/cooling is off) and when the unit is equipped for active dehumidification (optional).

When the Active Dehumidification state becomes active, the unit’s mechanical cooling capacity is set to 100% and all stages of electric/hydronic heat are used to maintain the DAT at the occupied heating setpoint. On Face & Bypass Control models the damper will module to full face. If the heating output reaches 100% open for 3-minutes or more (e.g., heating cannot keep up with cooling), the cooling is staged down until the DAT reaches the occupied heating setpoint. The UVC monitors the DAT to ensure it does not fall below MCLL, nor goes above DAHL. The space fan is forced to medium speed when the Active Dehumidification state is active. If a demand for heating and cooling is generated during the dehumidification mode, the unit will exit dehumidification mode and transition directly into the appropriate heating or cooling state.

The optional Active Dehumidification state is available during all occupancy modes. Active Dehumidification can be enabled by a binary input, a network input or by UVC logic if the unit is equipped with a space humidity sensor. If enabled by the binary input or a network input, the Active Dehumidification mode is disabled when the input is removed. If enabled by UVC logic, the Active UVC Dehumidification mode uses a 5% RH fixed differential below the RHS to determine when dehumidification is complete.

The CO_2 demand controlled ventilation function (optional) will be available (see “CO_2 Demand Controlled Ventilation (optional)” on page 37), and the OA damper is adjusted as needed to maintain the CO_2 setpoint.

Special Purpose Unit Modes

There are some additional UVC modes that are considered special purpose unit modes. These special purpose modes include Pressurize, Depressurize, Purge, Shutdown, and Energy Hold Off. These modes force the UVC to perform very specific and limited functions. Use these with caution and only for short periods as needed.

In each of these special purpose UVC modes, if the space temperature drops below EHS and the Emergency Heat function is enabled, the UVC is forced into the Emergency Heat mode (see "Emergency Heat Mode (Super State)" on page 18) and then return, once the Emergency Heat function is satisfied.

Table 8: Actions During Special Purpose Unit Modes

Action	Indoor air fan (IAF)	Outdoor air damper (OAD)	Exhaust fan output
Pressurize	High	100% Open	Off
Depressurize	Off	Closed	On
Purge	High	100% Open	On
Shutdown	Off	Closed	Off
Energy Hold Off	Auto	Auto	Auto

Pressurize Mode

When in Pressurize mode, the UVC uses the IAF, OAD, and exhaust output as needed to pressurize the space. The UVC stops all normal heating and cooling but does allow emergency heat if required. The pressurize mode can only be accessed via a network connection, through the LUI keypad, or with ServiceTools software.

Depressurize Mode

When in Depressurize mode the UVC uses the IAF, OAD, and exhaust output as needed to depressurize the space. The UVC stops all normal heating and cooling but does allow emergency heat if required. The depressurize mode can only be accessed via a network connection or through the LUI keypad, or with ServiceTools software.

Purge Mode

When in Purge mode, the UVC uses the IAF, OAD, and exhaust output as needed to purge the space. The UVC stops all normal heating and cooling but does allow emergency heat if required. The purge mode can only be accessed via a network connection through the LUI keypad, or with ServiceTools software.

Shutdown Mode

⚠ WARNING

Shutdown mode and Energy Hold Off mode are a "stop" state for the unit ventilator. It is not a "power off" state.

Shutdown mode is the equivalent of the Off mode, but is an Off mode forced by an external signal. When in Shutdown mode, the UVC stops all normal heating, cooling, ventilation (OA damper is closed), and fan operation. By default emergency heat is not be used during the shutdown mode, however, the UVC can be configured (Emergency Heat Shutdown Configuration) to allow emergency heat operation during shutdown mode. The shutdown mode can be accessed via a network connection, a binary input to the UVC, through the LUI keypad, or with ServiceTools software.

Energy Hold Off Mode

The UVC supports an Energy Hold Off mode. When active, it forces the UVC to stop all mechanical heating and cooling. Energy Hold Off mode is used by an external signal to force the UVC to cease mechanical heating and cooling when curbing energy usage is desired. In Energy Hold Off mode, mechanical heat is only allowed in the Emergency Heat mode. The Energy Hold Off mode is commanded via a network connection, the LUI keypad or ServiceTools software.

Unit Mode Priority

The UVC uses the network variables and binary inputs listed in Table 9 and to determine the current unit mode. Special purpose UVC unit modes have higher priority than the normal UVC unit modes as shown in the tables.

Each table lists the highest priority items on the left to the lower priority items to the right. The right-most columns indicate unit operation as a result of the left-most columns. Certain inputs will be ignored when another network variable or binary input with a higher priority has a specific input value.

Table 9: Special Purpose UVC Unit Mode Priority

Emergency override input[1]	Remote shutdown binary input	Energy hold off input[1]	Priority result		
			Energy hold off output[2]	Unit mode output[2]	Actual UVC action
Normal[3]	De-energized[4]	Normal	Normal	See the normal UVC mode priority ( )	
		Energy hold off	Energy hold off	Off	Off
	Energized[5]	Ignored	Energy hold off	Off	Off
Pressurize	Ignored	Ignored	Ignored	Off	Pressurize
De-pressurize	Ignored	Ignored	Ignored	Off	De-pressurize
Purge	Ignored	Ignored	Ignored	Off	Purge
Shutdown	Ignored	Ignored	Ignored	Off	Off

1. Network input.
2. Network output.
3. Normal indicates the UVC power-up condition.
4. De-energized indicates that the contacts connected to this binary input are open.
5. Energized indicates that the contacts connected to this binary input are closed.

Table 10: Normal UVC Mode Priority

Application override input[1]	Unit mode override input[1]	Priority result
		Unit mode output[2]
Normal (Auto)[3]	Normal (Auto)[3]	Heat
		Cool
		Emergency heat
		Fan Only
	Heat	Heat or Fan Only
	Cool	Cool or Fan Only
	Night purge	Night purge
	Off	Off
	Emergency heat	Emergency heat
	Fan only	Fan only
Heat	Ignored	Heat or Fan Only
Cool	Ignored	Cool or Fan Only
Night purge	Ignored	Night purge
Off	Ignored	Off
Emergency heat	Ignored	Emergency heat

1. Network input.
2. Network output.
3. Normal (Auto) is the normal UVC power-up state.

Occupancy Modes

The UVC is provided with four occupancy modes: Occupied, Standby, Unoccupied, and Bypass. The occupancy mode affects which heating and cooling temperature setpoints are used, affects IAF operation, and affects OAD operation. The Occupancy Manual Command and Network Occupancy Sensor network variables, along with the Unoccupied and Tenant Override binary inputs, are used to determine the Effective Occupancy. Certain inputs are ignored when another network variable or binary input with a higher priority has a specific input value.

NOTE: The Occupancy Manual Command is provided as a way for a network connection to manually force the UVC into a particular occupancy mode. The Occupancy Manual Command can override the tenant override feature. For example, if the network uses the Occupancy Manual Command to force the unit into unoccupied mode, then the tenant override switch does not operate as expected. Therefore, Daikin strongly recommends using the Occupancy Sensor Input to control occupancy modes over a network and only using the Occupancy Manual Command if there is reason to ensure tenant override does not occur.

Occupied Mode

The Occupied mode is the typical day time mode of UVC operation. During Occupied mode the UVC uses the occupied heating and cooling setpoints, the OAD operates normally, and by default the IAF remains on. The IAF can be configured to cycle off when there's no demand using the LUI keypad or ServiceTools software.

Unoccupied Mode

The Unoccupied occupancy mode is the typical night time or weekend mode of UVC operation. During Unoccupied mode the UVC uses the unoccupied heating and cooling setpoints, the OAD remains closed, and the IAF cycles as needed for heating or cooling. The IAF remains off when there is no need for heating or cooling by default. The IAF can be configured to remain on (at low speed) in unoccupied mode with the LUI keypad or ServiceTools software.

Standby Mode

The Standby mode is a special purpose daytime mode of UVC operation. During Standby mode the UVC uses the standby heating and cooling setpoints, the OAD remains closed, and by default the IAF remains on. The standby setpoints are closer to the occupied setpoints versus the unoccupied setpoints. This allows the space to achieve the desired occupied condition more quickly than when coming out of the Unoccupied mode.

Bypass Mode

The Bypass mode (also called Tenant Override) is the equivalent of a temporary occupied mode. Once the Bypass mode is initiated, it remains in effect for a set period of time (120 minutes, default). During the bypass mode, the UVC uses the occupied heating and cooling setpoints, the OAD operates normally, and by default the IAF remains on.

Table 11: Occupancy Mode Interactions

Occupancy Override Input (MSV7)	LUI OccManCmd	Tenant Override Active/Inactive	Occupancy Scheduler Input (MSV8)	Internal Schedule	Occupancy Sensor Input (MSV9)	Hardwired Sensor Input	Effective Occupancy Output (MSV6)
1 (Occ)	NA	NA	NA	NA	NA	NA	1 (Occ)
2 (Unoc)	NA	NA	NA	NA	NA	NA	2 (Unoc)
3 (Bypass)	NA	NA	1 (Occ)	NA	NA	NA	1 (Occ)
			2 (Unoc)	NA	NA	NA	3 (Bypass)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	NA	NA	1 (Occ)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	3 (Bypass)
				Unoc	3 (Null)	NoBI[1]	3 (Bypass)
				Unoc	3 (Null)	Occ[2]	1 (Occ)
				Unoc	3 (Null)	Unoc[3]	3 (Bypass)
4 (Standby)	NA	NA	NA	NA	NA	NA	4 (Standby)
5 (Null)	Occ	NA	NA	NA	NA	NA	1 (Occ)
5 (Null)	Unoc	NA	NA	NA	NA	NA	2 (Unoc)
5 (Null)	Bypass	NA	1 (Occ)	NA	NA	NA	1 (Occ)
			2 (Unoc)	NA	NA	NA	3 (Bypass)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	NA	NA	1 (Occ)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	3 (Bypass)
				Unoc	3 (Null)	NoBI[1]	3 (Bypass)
				Unoc	3 (Null)	Occ[2]	1 (Occ)
				Unoc	3 (Null)	Unoc[3]	3 (Bypass)
5 (Null)	Standby	NA	NA	NA	NA	NA	4 (Standby)
5 (Null)	Null	Inactive	1 (Occ)	NA	1 (Occ)	NA	1 (Occ)
				NA	2 (Unoc)	NA	4 (Standby)
				NA	3 (Null)	NoBI[1]	1 (Occ)
				NA	3 (Null)	Occ[2]	1 (Occ)
				NA	3 (Null)	Unoc[3]	4 (Standby)
			2 (Unoc)	NA	NA	NA	2 (Unoc)
			3 (Standby)	NA	NA	NA	4 (Standby)
			4 (Null)	Occ	1 (Occ)	NA	1 (Occ)
				Occ	2 (Unoc)	NA	4 (Standby)
				Occ	3 (Null)	NoBI[1]	1 (Occ)
				Occ	3 (Null)	Occ[2]	1 (Occ)
				Occ	3 (Null)	Unoc[3]	4 (Standby)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	2 (Unoc)
				Unoc	3 (Null)	NoBI[1]	2 (Unoc)
				Unoc	3 (Null)	Occ[2]	1 (Occ)
				Unoc	3 (Null)	Unoc[3]	2 (Unoc)
5 (Null)	Null	Active	1 (Occ)	NA	1 (Occ)	NA	1 (Occ)
				NA	2 (Unoc)	NA	3 (Bypass)
				NA	3 (Null)	NoBI[1]	1 (Occ)
				NA	3 (Null)	Occ[2]	1 (Occ)
				NA	3 (Null)	Unoc[3]	3 (Bypass)
			2 (Unoc)	NA	NA	NA	3 (Bypass)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	1 (Occ)	NA	1 (Occ)
				Occ	2 (Unoc)	NA	3 (Bypass)
				Occ	3 (Null)	NoBI[1]	1 (Occ)
				Occ	3 (Null)	Occ[2]	1 (Occ)
				Occ	3 (Null)	Unoc[3]	3 (Bypass)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	3 (Bypass)
				Unoc	3 (Null)	NoBI[1]	3 (Bypass)
				Unoc	3 (Null)	Occ[2]	3 (Bypass)
				Unoc	3 (Null)	Unoc[3]	3 (Bypass)

NOTE: The tenant override is a set of dry contacts placed in parallel with the space temperature sensor (aiSetpointAdjust). When the contacts are closed momentarily, the bypass timer becomes active and is set to ncpBypassTime, and the unit enters the Bypass mode. The tenant override function is active until the timer expires.

[1] No binary inputs are configured for an Unoccupied input.
[2] A binary input is configured for an Unoccupied input and that input indicates occupied.
[3] A binary input is configured for an Unoccupied input and that input indicates unoccupied.

Additional Occupancy Features

Network Occupancy Sensor Capability

A networked occupancy sensor can be interfaced with the Occupancy Sensor Input variable to select occupancy modes. When the Occupancy Sensor Input variable is used, it automatically overrides any hard-wired unoccupied binary input signal.

Internal Daily Schedule

The UVC has a user configurable internal daily schedule capable of two occupied times and two unoccupied times for each of the seven days of the week, and one holiday schedule. This internal schedule can be overridden through the LUI keypad or network communications accordance with on page 27. The internal schedule is set up through the LUI keypad or ServiceTools software.

The UVC's real time clock maintains time through a power cycle subject to the battery installed on the controller. If the internal schedule is being used, it is recommended that the battery be replaced every 2 years as part of a regular maintenance program. See IM 1286 for more details.

Remote Wall-Mounted Sensor Tenant Override Switch

The optional remote wall-mounted sensors include a tenant override switch. This switch provides a momentary contact closure that can be used by room occupants to temporarily force the UVC into the bypass occupancy mode from unoccupied mode.

NOTE: The Occupancy Override Input can override the tenant override feature. For example, if the network uses the Occupancy Override Input to force the unit into unoccupied mode, then the wall sensor tenant override switch does not operate as expected. Therefore, Daikin strongly recommends using the Occupancy Sensor Input to control occupancy modes over a network and only using the Occupancy Override Input if there is reason to ensure tenant override does not occur.

Remote Wall-Mounted Sensor Status LED

The optional remote wall-mounted sensors each include a UVC status LED. This status LED aids diagnostics by indicating the UVC occupancy mode and fault condition.

Table 12: Remote Wall-Mounted Sensor Status LED

Status LED Mode	Condition	Priority	LED On Time (Sec)	LED Off Time (Sec)
ALARM_ACTIVE	Alarm Active: Specific Alarm Determines Number of Flashes	1	0.3	0.3 (1.3 Between Cycles)
WINK	Network Wink Activity	2	0.2	0.2
SERVICE_TEST	Service Test Mode	3	0.0	Continually
UNOCC	Unoccupied Mode	4	0.5	5.5
STANDBY	Standby Mode	5	5.5	0.5
OCC_BYPASS	Occupied Bypass Mode	6	Continually	0.0

Space Temperature Setpoints

The UVC uses the six occupancy-based temperature setpoints as the basis to determine the Effective Setpoint Output. The effective setpoint is calculated based on the unit mode, the occupancy mode, and the values of several network variables. The effective setpoint then is used as the temperature setpoint that the UVC maintains.

Table 13: Default Occupancy-Based Temperature Setpoints

Temperature setpoint	Abbreviation	Defaults
Unoccupied cool	UCS	82.0°F (27.8°C)
Standby cool	SCS	77.0°F (25.0°C)
Occupied cool	OCS	73.0°F (22.8°C)
Occupied heat	OHS	70.0°F (21.1°C)
Standby heat	SHS	66.0°F (18.9°C)
Unoccupied heat	UHS	61.0°F (16.1°C)

Network Setpoint Capability

The Setpoint Input variable is used to allow the temperature setpoints for the occupied and standby modes to be changed via the network; the unoccupied setpoints are not affected by this variable.

Network Setpoint Offset Capability

The Networked Setpoint Offset Input variable is used to shift the effective occupied and standby temperature setpoints by adding the value of the Setpoint Offset Input variable to the current setpoints; the unoccupied points are not affected by this variable. This variable is typically set bound to a supervisory network controller or to a networked wall module having a relative setpoint dial.

Use the keypad/display to make adjustments to the value of the Setpoint Offset Input variable. See "Effective Setpoint Calculations" on page 31.

NOTE: The keypad/display and the network both affect the Setpoint Offset Input variable. Keep in mind that the most recent change to this variable will be the one that is used.

Network Setpoint Shift Capability

The Setpoint Shift Input variable is used to shift the effective heat/cool setpoints. It typically is bound to a networked supervisory controller or system that provides functions such as outdoor air temperature compensation. All occupied, standby, and unoccupied setpoints are shifted upward (+) or downward (–) by the corresponding value of the Setpoint Shift Input variable.

Network Space Temperature Sensor Capability

A networked space temperature sensor can be interfaced with the Space Temp Input variable. When the Space Temp Input variable is used (valid value), it automatically overrides the hard-wired space temperature sensor.

Remote Wall-Mounted Sensor with +/–5°F Adjustment (optional)

When the optional remote wall-mounted sensor with +/–5°F adjustment dial is used, the UVC effectively writes the value of the setpoint adjustment dial to the Setpoint Offset Input variable.

NOTE: If a network connection is used to adjust the Setpoint Offset Input variable, you must not use the optional remote wall-mounted sensor with +/–5°F adjustment. If the LUI keypad is used by room occupants to adjust the Setpoint Offset, do not use the optional remote wall-mounted sensor with +/–5°F adjustment. If you have the optional remote wall-mounted sensor with +/–5°F adjustment and an occupant uses the LUI keypad to make Setpoint Offset adjustments, this overrides any +/–5°F adjustment on the optional remote wall-mounted sensor since the LUI has higher priority. If you find that changes to the +/–5°F adjustment on the remote wall-mounted sensor have no effect, it is likely that an occupant used the LUI keypad to make a Setpoint Offset change. Cycle unit power and restore the ability to change the Setpoint Offset from the +/–5°F adjustment on the remote wall-mounted sensor.

Remote Wall-Mounted Sensor with 55°F to 95°F Adjustment (optional)

When the optional remote wall-mounted sensor with 55°F to 95°F adjustment dial is used, the UVC writes the value of the setpoint dial to the Space Temp Setpoint Input variable.

NOTE: If a network connection is using the Space Temp Setpoint Input variable, do not use the optional remote wall-mounted sensor with 55°F to 95°F adjustment.
– If it is intended that the LUI will be used by room occupants to adjust the Setpoint Offset, then you must not use the optional remote wall-mounted sensor with 55°F to 95°F adjustment. When using the optional remote wall-mounted sensor with 55°F to 95°F adjustment, the UVC will ignore any Setpoint Offset changes made at the LUI keypad.

Disabling Remote Wall-Mounted Sensor Adjustment (optional)

The UVC can be configured to ignore the setpoint adjustment input being supplied by an optional remote wall-mounted sensor. This is accomplished by adjusting the Setpoint Adjust Sensor Installed parameter through the LUI keypad or the ServiceTools software.

Control Temperature

The Control Temperature value is compared to the effective heating and cooling setpoints to determine if the unit should go into the heating or cooling mode. By default the control temperature will be set to the Room Air Temperature (RAT). If an optional wall-mounted space temperature sensor has been installed, the control temperature can be changed to the Space Temperature, or an average of the Space and Room Air Temperature values. Changing the Control Temperature source can be done through the LUI keypad or ServiceTools software.

Effective Setpoint Calculations

The UVC calculates the effective setpoint (Effective Setpoint Output) based on several factors. These factors include the six occupancy setpoints for heating and cooling (Occupancy Temperature Setpoint), occupancy mode, the value of the network variables Space Temp Setpoint Input, Setpoint Offset Input, and the Setpoint Shift Input as well as the optional wall-mounted sensor's setpoint adjustment dial. As always, network inputs have priority over hardwired connections.

The UVC determines if heating or cooling is required based on the current unit mode (Heat/ Cool Mode Output) and then calculates the required setpoint for heating or cooling. After calculating, the Effective Setpoint Output network variable is set equal to the calculated setpoint. The Effective Setpoint Output is the temperature setpoint maintained by the UVC and that appears on the LUI display.

Figure 17: Effective Setpoint Calculations

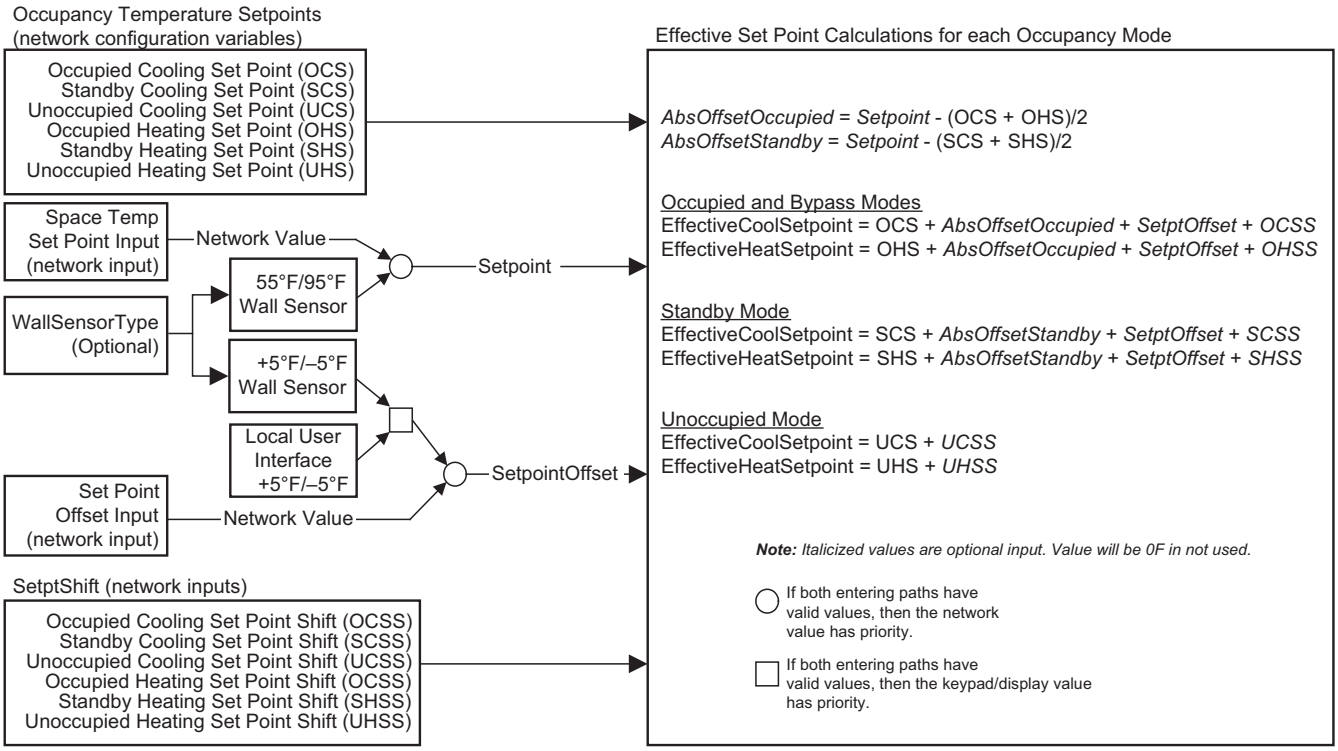


Table 14: Setpoint Calculation Examples

Example A – Stand-Alone Unit, No remote sensor, No network communication
Given
Occupancy Mode = Occupied and Unit Mode = Heat
Space Temp Setpoint = (not used)
Setpoint Offset = (from LUI) = 0.0°F
Setpoint Shift = (not used) = 0.0°F
OHS = 69.8°F
Effective setpoint calculations
Effective Setpoint = OHS + AbsOffset + Setpoint Offset + Setpoint Shift = 69.8°F + 0.0°F + 0.0°F + 0.0°F = 69.8°F
Example B – Stand-Alone Unit, Remote sensor with 55ºF – 95ºF Setpoint, No network communication
Given
Occupancy Mode = Occupied and Unit Mode = Heat
Space Temp Setpoint = 71.0°F (from remote sensor)
Setpoint Offset = -1.0°F (from LUI)
Setpoint Shift = (not used) = 0.0°F
OCS = 75.0°F, OHS = 70.0°F
Effective setpoint calculations
Absolute Offset = Setpoint - (OCS + OHS) / 2 = 71°F - (75.0°F + 70.0°F) / 2 = -1.5°F
Effective Setpoint = OHS + AbsOffset + Setpoint Offset + Setpoint Shift = 70.0°F - 1.5°F - 1.0°F - 0.0°F = 67.5°F
Example C – Stand-Alone Unit, Remote sensor with +/- 5°F, BACnet network communication
Given
Occupancy Mode = Occupied and Unit Mode = Heat
Space Temp Setpoint = 71.0°F (from network input)
Setpoint Offset = +3.0°F (from remote sensor)
Setpoint Shift = (from network input) = -2.0°F
OCS = 74.0°F, OHS = 68.0°F
Effective setpoint calculations
AbsOffset = Setpoint - (OCS + OHS) / 2 = 71.0°F - (72.0°F + 68.0°F) / 2 = 1.0°F
Effective Setpoint = OHS + AbsOffset + Setpoint Offset + Setpoint Shift = 68.0°F + 1.0°F + 3.0°F – 2.0°F = 70.0°F

Proportional Integral (PI) Control Loops

The MicroTech UVC uses PI-loop control for heating, cooling and ventilation processes within the unit ventilator. Numerous PI algorithms can be used depending upon the unit ventilator configuration (Table 15).

Table 15: PI Loop List

PI loops		Setpoint	Feedback (controlled variable)	Output
PI-1	Single Zone VAV Fan	Effective Heating or Cooling Temperature Setpoint	Control Temperature	Fan Speed
PI-2	Economizer / Free Cooling	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Position the OA Damper
PI-3	Modulating Cooling Valve	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Modulating Cooling Valve Position
PI-4	Modulating Hot Water Valve	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Modulating Hot Water Valve Position
PI-5	Face and Bypass Damper	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Face and Bypass Damper Position
PI-6	CO_2 / Demand Control Ventilation	Effective Space CO_2 Setpoint	Space CO_2	Position the OA Damper
PI-7	DAT Low Limit	Effective Reheat Discharge Air Temperature Setpoint	Discharge Air Temperature	Position the OA Damper
PI-8	Electric Heat	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Electric Heat Stage

PI Control Parameters

⚠ CAUTION

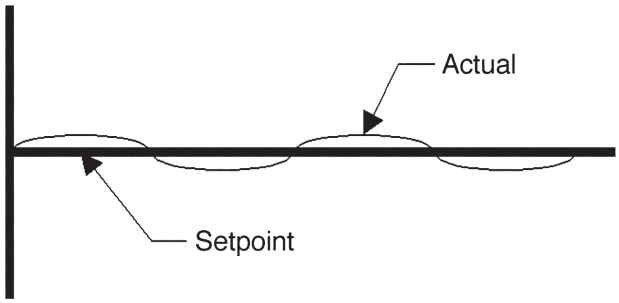
Adjusting PI parameters can cause erratic unit operation, and potentially damage the equipment.

PI control parameters should only be adjusted by trained personnel having a complete understanding of how these parameters affect system operation. Generally these parameters do not need to be adjusted from the factory default settings.

Associated with each PI loop is a set of two adjustable parameters: Proportional Band and Integral Time. When the unit ventilator is properly sized for the space, the factory settings for these parameters provides the best and most robust control action (Figure 18).

If field problems arise, first ensure these parameters are set back to the factory default settings. If adjustment is required, only make small adjustments to one parameter at a time. After each adjustment, allow enough time for the system to stabilize before making further adjustments. If you do not have the means to graph the space performance, record the actual measured value and setpoint for several minutes and then plot the results using a spreadsheet to determine the correct action to change the PI parameter.

Figure 18: Optimized PI Loop Control

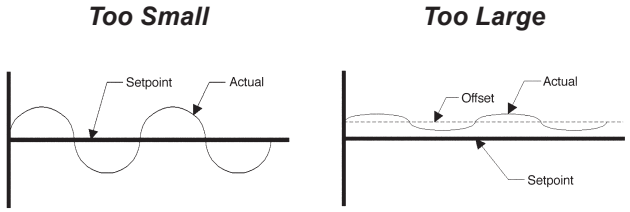


Proportional Band

The proportional band, or proportional action, causes the controlled output to change in proportion to the magnitude of the difference between the sensor value and setpoint.

A proportional band setting that is too small (Figure 19) causes control oscillations that go fully above and below the setpoint. A proportional band setting that is too large (Figure 19) causes an offset between the actual measured oscillation center and the setpoint. A small offset is not necessarily a problem since most systems have a small “natural” offset and the integral function automatically works to eliminate or reduce this effect.

Figure 19: Proportional Bands



In general, it is best to start with a relatively large proportional band setting (use of default setting is recommended) and adjust to smaller values.

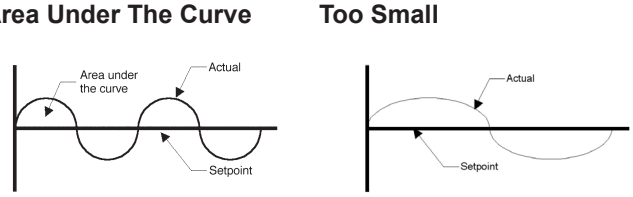
If you want the system to respond strongly to small changes in the space, adjust the proportional band to a higher setting.

If you want the system to react weakly to small changes in the space, adjust the proportional band to a lower setting.

Integral Time

The integral time, or integral action, causes the controlled output to change in proportion to time difference between the sensor value and setpoint. The difference over time between the actual value and setpoint forms an “area under the curve” (Figure 20). The integral action works to reduce this “area under the curve” and to eliminate any natural system offset.

Figure 20: Integral Time



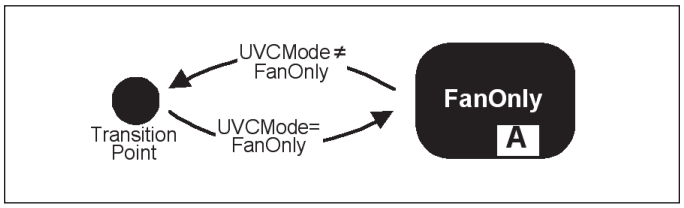
The smaller the integral time, the faster the output ramps up or down with small changes in the space. The smaller the integral time, the quicker the system reacts to small changes in the space. If the Integral Time is set too small, long oscillations occur (Figure 20).

In general, it is best to start with a relatively large integral time setting the factory default setting is best and adjust to smaller values. If you want the system respond strongly to small changes in the space, lower the integral time. If you want the system to react weakly to small changes in the space, adjust the integral time to a higher setting.

Indoor Air Fan Operation

The UVC supports a variable speed, or three-speed indoor air fan (IAF); low, medium, and high. The UVC calculates the effective fan speed and operation based on the unit mode, the occupancy mode, and the values of several network variables.

Figure 21: Fan Only State Diagram



Auto Mode

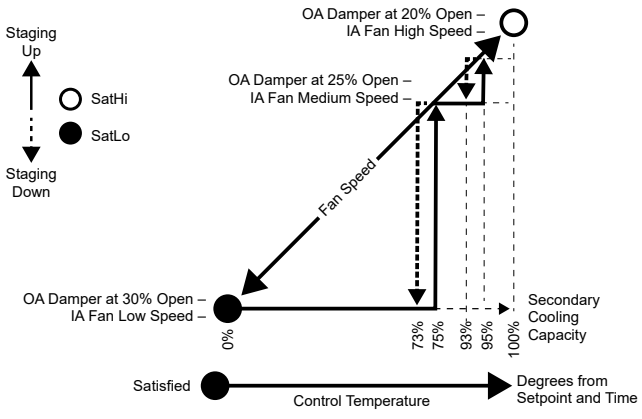
The UVC is provided with a user selectable auto fan mode feature. When in auto fan mode, the UVC uses the space temperature PI loop to automatically adjust the fan speed as needed to maintain space temperature. This ensures that the UVC maintains the lowest and quietest fan speeds whenever possible. When in auto fan mode, a maximum of six fan speed changes per hour is allowed (by default). This prevents frequent automatic fan speed changes from disturbing room occupants. The number of fan changes per hour can be configured through the LUI keypad or ServiceTools software.

Manual Fan Mode

The indoor fan may be manually set locally to Low, Medium or High speed through the LUI keypad or using the ServiceTools software. When the fan speed is selected this way, the setting is not affected by a unit power cycle.

A remote wall sensor with fan speed switch may be used to locally change the fan speed.

Figure 22: **Fan Control - 3-Speed Fixed/Adjustable**



Fan Operation With Compressors

Compressor operation with low airflow may result in nuisance trips and poor operation. Because of this, if the fan is off or at low speed when the compressor operation is required, the fan speed will be increased to medium.

Occupied, Standby, and Bypass Operation

During Occupied Standby and Bypass modes, the IAF, by default, remains On. The IAF can optionally be field configured to cycle off when there's no call for heating or cooling through the LUI keypad or ServiceTools software.

Unoccupied Operation

During unoccupied mode, the IAF typically remains Off and cycles with calls for heating and cooling. The IAF can optionally be field configured to run at low speed in unoccupied mode when there's no call for heating or cooling through the LUI keypad or ServiceTools software.

Cycling Fan

The UVC is provided with a Fan Cycling Configuration variable that can be used to force the IAF to cycle with calls for heating and cooling during the occupied, standby, and bypass occupancy modes. When the fan is off, the OA damper is closed. Daikin recommends using this feature only when it is acceptable that normal ventilation is not required.

When the IAF is set to cycle, the UVC is configured to continue fan operation for a time period after heating or cooling is complete.

Off Delay

When the UVC is placed into Off mode or Shutdown mode, the UVC is configured to continue fan operation for a short time period and then shutdown.

Fan Control

The UVC is factory configured to control a fan in one of three ways depending on the type of fan the unit has (**Figure 21**).

3-Speed Fixed

The UVC uses three binary outputs to control a fan to low, medium, or high speed. When fan control is in the Auto mode, the UVC adjusts the fan speed up and down in an attempt to maintain the control temperature setpoint. The fan capacity percentage required will be calculated using a PI loop comparing the control temperature and effective setpoint. The fan speed increases when the capacity percentage required is greater than or equal to the break point + the break point differential defined in Table 16 on page 35.

The fan speed decreases when the capacity percentage required is less than the break point.

If the UVC is configured for continuous fan operation, the fan remains at low speed when no capacity is required.

3-Speed Adjustable

The UVC uses three defined PWM outputs to control the IAF to low, medium, or high speed. When fan control is in the Auto mode, the UVC adjusts the fan speed up and down in an attempt to maintain the control temperature setpoint. The fan capacity percentage required is calculated using a PI loop comparing the control temperature and effective setpoint. The fan speed increases when the capacity percentage required is greater than or equal to the break point + the break point differential defined in Table 16.

Table 16: Fan Speed Break Points

Break Point Auto Low	5%
Break Point Auto Medium	75%
Break Point Auto High	95%
Break Point Auto Differential	2%

The fan speed decreases when the capacity percentage required is less than the break point.

The fan speed signal used for low, medium, and high speed is defined in Table 17 and can be field adjusted using the LUI keypad or ServiceTools software. The application ensures that low speed ≤ medium speed ≤ high speed and also prevent the selection of a fan speed that is outside of the min/max range for that fan setting.

If the UVC is configured for continuous fan operation, the fan remains at low speed when no capacity is required.

Table 17: Ranges For 3 Speed Adjustable Fan

Fan Speed	Operating Range
PWM low fixed-speed	50% - 80%
PWM medium fixed-speed	70% - 90%
PWM high fixed-speed	80% - 100%

Variable Speed Fan

The UVC uses a variable PWM output to control the IAF. When fan control is in the Auto mode, the UVC adjusts the fan speed up and down in an attempt to maintain the control temperature setpoint. The fan capacity percentage required is calculated using a PI loop comparing the control temperature and effective setpoint.

Outdoor Air Damper Operation

The UVC is configured for an OA damper operated by a proportional actuator. The OA damper actuator contains a spring that ensures the OA damper is closed upon loss of power. The proportional actuator is controlled by a single analog signal and a single binary on/off signal. The OA damper typically is open to the current minimum position during the occupied and bypass occupancy modes and closed during the unoccupied and standby occupancy modes.

Minimum Position

This allows each unit to be field configured to provide the amount of fresh air required to the space at each of the three IAF speeds. For units with EC fan motors configured for variable speed fan operation and no CO_2, the OA damper minimum position ramps linearly between the low speed minimum position percent to the high speed minimum position percent as the motor ramps linearly from minimum speed to maximum speed.

Table 18: Default OA Damper Minimum Positions

IAF speed	Without CO_2	With CO_2
High	20%	5%
Medium	25%	5%
Low	30%	5%

NOTE: If the CO_2 Demand Controlled Ventilation (DCV) option is used, the UVC only uses the IAF high speed OA damper minimum position regardless of fan speed. The DCV function adjusts the OA damper above this minimum as needed to maintain CO_2 setpoint.

Economizer Operation

The economizer function is used by the UVC to determine if the OA is adequate for economizer (primary) cooling. When both the economizer and mechanical cooling are available, the economizer is used as primary cooling and the UVC adds mechanical cooling only if the economizer is not adequate to meet the current cooling load (e.g., the OA damper reaches 100% and cooling is still required).

The UVC supports three economizer functions:

- Basic (default)—Temperature Comparison Economizer
- Expanded (optional)—Temperature Comparison with OA Enthalpy Setpoint Economizer
- Leading Edge (optional)—Temperature Comparison with Enthalpy Comparison Economizer

Basic - Temperature Comparison Economizer (default)

If the default Basic economizer function is selected, the unit ventilator ships with an optional IA and OA humidity sensors. In this case, the UVC is factory set for the Basic Economizer Strategy—the UVC automatically detects that no OA humidity sensor is present and adjusts to use the Temperature Comparison Economizer function.

Expanded - Temperature Comparison with OA Enthalpy Setpoint Economizer (optional)

If the optional Expanded economizer function is selected, the unit ventilator ships with an optional OA humidity sensor, which is used along with the OA temperature sensor to calculate OA enthalpy. In this case, the UVC is configured for the Expanded Economizer Strategy and uses the Temperature Comparison with OA Enthalpy Setpoint Economizer function. Refer to **Table 19** and **Table 20**.

NOTE: Temperature Comparison with OA Enthalpy Setpoint Economizer requires an optional OA humidity sensor.

Leading Edge - Temperature Comparison with Enthalpy Comparison Economizer (optional)

If the optional Leading Edge economizer function is selected, the unit ventilator ships with an optional IA humidity and OA humidity sensor, which are used along with the IA temperature and OA temperature sensors to calculate IA enthalpy and OA enthalpy. In this case, the UVC is factory set for the Leading Edge Economizer Strategy and uses the Temperature Comparison with Enthalpy Comparison Economizer function. Refer to Table 19 and Table 20.

NOTE: Temperature Comparison with Enthalpy Comparison requires both an optional OA humidity sensor and an optional IA humidity sensor.

Table 19: Economizer Enable/Disable Tests Defined

Tests	Economizer Enable/ Disable Tests	Enable Test	Disable Test
A	OA temp setpoint	Effective OA Temp < (Econ OA Temp Setpt – Econ Temp Diff)	Effective OA Temp >= Econ OA Temp Setpt
B	IA/OA differential temp	Effective OA Temp = < (Effective Space Temp - EconOASetpt)	Effective OA Temp > (Effective Space Temp – EconOASetpt - EconDBDiff)
C	OA enthalpy setpoint	Effective OA Enthalpy = < (Econ OA Enthalpy Setpt – Econ Enthalpy Diff)	Effective OA Enthalpy >= Econ OA Enthalpy Setpt
D	IA/OA differential enthalpy	Effective OA Enthalpy < (Effective Space Enthalpy – Econ Enthalpy Diff)	Effective OA Enthalpy >= Effective Space Enthalpy

Table 20: How Economizer Enable/Disable Tests are Selected

Economizer Strategy	Control Temp Sensor	OA Temp Sensor	Space Humidity Sensor	OA Humidity Sensor	Economizer Enable/ Disable Tests
All	Unreliable	Ignored	Ignored	Ignored	OA damper closed
	Ignored	Unreliable	Ignored	Ignored	OA damper closed
Basic	Reliable	Reliable	Ignored	Ignored	Test B or Test A
Expanded	Reliable	Reliable	Ignored	Reliable	Test C and Either Test B or Test A
	Reliable	Reliable	Ignored	Unreliable	Test B or Test A
Leading Edge	Reliable	Reliable	Reliable	Reliable	Test D and Test B
	Reliable	Reliable	Reliable	Unreliable	Test B or Test A
	Reliable	Reliable	Unreliable	Reliable	Test C and Either Test B or Test A
	Reliable	Reliable	Unreliable	Unreliable	Test B or Test A

NOTE: The hard-wired sensor and the equivalent input must both be unreliable for the value to be considered unreliable.

Network Space Humidity Sensor Capability

A space humidity value can be provided to the UVC using the Space Humidity Input network variable. When the Space Humidity Input variable is used (valid value), it automatically overrides the hard-wired space humidity sensor (if present).

Network Outdoor Humidity Sensor Capability

An outdoor humidity value can be provided to the UVC using the Outdoor Humidity Input variable. When the Outdoor Humidity Input variable is used (valid value), it automatically overrides the hard-wired outdoor humidity sensor (if present).

CO_2 Demand Controlled Ventilation (optional)

Ventilation equipment typically uses fixed damper positions to determine the amount of Outdoor Air (OA) for proper ventilation within the space. Most commonly, the fixed position of the OA damper is based on the maximum number of occupants the space is designed to accommodate. However, this fixed OA damper operation ignores the fact that most spaces during the day have varying occupancy levels and may only rarely reach maximum design occupancy levels. This type of fixed damper control for ventilation is often less energy efficient when outdoor air is treated during periods of low occupancy.

Since occupants inherently produce CO_2 as they exhale, the CO_2 level is directly related to the number of people in a given space.

The UVC can optionally be factory configured to provide CO_2-based Demand Controlled Ventilation (DCV). The CO_2 DCV function is useful in saving the energy typically wasted in treating OA not actually needed for ventilation within a space during occupancy levels below maximum design. The CO_2 DCV function uses PI-loop control to adjust the OA damper above the minimum position as needed to maintain the Space CO_2 Setpoint (1200 PPM default).

The minimum damper position used with CO_2 DCV typically can be set at ~20% of the minimum position that would be used without CO_2 DCV. For example, if the minimum OA damper position is 20% then when using CO_2 DCV, set the new minimum OA damper position as low as 4% (e.g., 20% × 0.20 = 4%). For most applications this new, smaller minimum OA damper position should provide enough ventilation to control undesirable conditions such as odors within the space.

NOTE: The CO_2 DCV function can increase the OA damper position past that required by the economizer and vice versa.

– If odors within the space are a nuisance, increase the OA damper minimum position as needed to eliminate these odors. It may be necessary with new construction or after renovation to raise the minimum position for some time period to help reduce odor buildup due to the out-gassing of new construction material, and then return the minimum OA damper to its previous position.

– If the CO_2 Demand Controlled Ventilation (DCV) option is used, the UVC only uses the IAF high speed OA damper minimum position regardless of fan speed. The DCV function adjusts the OA damper above this minimum as needed. In this case, the IAF high speed OA damper minimum position is set at 5%.

Network Space CO_2 Sensor Capability

A network space CO_2 value can be provided to the UVC using the Space CO_2 Input network variable. When the Space CO_2 Input variable is used (valid value), it automatically overrides the hard-wired space CO_2 sensor (if present).

ASHRAE Cycle II

The UVC supports ASHRAE Cycle II operation. The basis of ASHRAE Cycle II is to maintain the required minimum amount of ventilation whenever possible, which can be increased during normal operation for economizer cooling or CO_2 DCV control or reduced to prevent excessively cold discharge air temperatures.

A discharge air temperature sensor is installed in all unit ventilators. If necessary, the ASHRAE II control algorithm overrides room control and modifies the heating, ventilating, and cooling functions (as available) to prevent the discharge air temperature from falling below the VCLL setpoint.

Compressor Operation

The UVC is configured to operate the compressor as secondary (mechanical) cooling when the economizer is available. When the economizer is not available and the compressor is available, the UVC uses the compressor when cooling is required.

Compressor operation is interlocked with the F&BP damper position such that the compressor cannot be energized unless the F&BP damper is 100% open to face position.

Compressor Cooling Lockout

The UVC is configured to lockout compressor cooling when the OA temperature falls below the Compressor Cooling Lockout setpoint (63.5°F/17.5°C). Below this point, only economizer cooling is available.

Compressor Heating Lockout

The UVC is configured to lock out compressor heating when the OA temperature falls below the Compressor Heating Lockout setpoint (30.0°F/1.11°C). Below this point, only secondary heating (electric heat) is available.

Compressor Minimum ON and OFF Timers

The UVC is provided with minimum on (3-minute default) and minimum off (6-minute default) timers to prevent adverse compressor cycling.

Compressor Start Delay

The UVC is provided with a Compressor Start Delay configuration variable, which is intended to be adjusted as part of the start-up procedure for each unit. This variable is used to delay compressor operation each time the compressor is required.

NOTE: To prevent strain on a building's electrical supply system from multiple unit compressors all starting at the same time a random value (0-60 seconds) is added to the minimum off time after a power failure or after an unoccupied-to-occupied changeover.

Reversing Valve Operation

The UVC is configured to minimize reversing valve operations. The reversing valve switches to Heat mode (energized) 5 seconds after the compressor comes on in Heat mode. The reversing valve remains energized until the UVC enters Cool mode and the compressor has been running for 5 seconds (reversing valve de-energized). If the UVC modes are changed manually (via the keypad/display or network connection) from Heat-to-Cool or Cool-to-Heat during compressor operation, the compressor de-energizes immediately.

Motorized Water Valve Delay

For WSHP units (AR or GR), the UVC is provided with a Motorized Water Valve Delay configuration variable (30 seconds, default). This variable can be used, if necessary to provide a delay in compressor operation when using a motorized water valve, allowing time for the valve to open. This delay, if used, is added to the compressor start delay.

Outdoor Air Fan Operation

For self contained units with a condenser section (AE and AZ) the UVC is configured with a fan on delay that delays OA fan operation for a time period (10 seconds, default) after the compressor starts. The OA fan stops with the compressor.

Water Coil Leaving Air Thermostat (Freeze-stat)

Unit ventilators ship with a normally-closed low temperature thermostat to detect low leaving air temperature conditions on the indoor air coil. This thermostat is mounted on the discharge air side of the unit's water coil. The low temperature thermostat cut-out is 38°F +/–2°F (3°C +/– 1°C) and the cut-in is 45°F +/–2°F (7°C +/–1°C). When the low temperature thermostat detects low leaving air temperatures (contacts open), the following occurs.

Valve Control

When the freeze-stat cuts-out:

1. The OA damper closes immediately.
2. The space fan stops.
3. The wet heat and chilled water valve minimums are set to 100%.

When the freeze-stat cuts-in, the UVC returns to normal operation.

Face and Bypass Damper Control

When the freeze-stat cuts-out:

1. The OA damper closes immediately.
2. The space fan stops.
3. The wet heat and chilled water EOC valves open immediately.
4. The F&BP damper goes to the full bypass position.

When the freeze-stat cuts-in the UVC returns to normal operation.

The UVC ignores the low temperature thermostat when the OA temperature is greater than Compressor Cooling Lockout Setpoint (e.g., the low temperature thermostat is ignored during the cooling season).

2-Pipe Changeover Heating/ Cooling Availability

The UVC uses a Source (Water-In) temperature sensor to determine if the water-in temperature is adequate for heating or cooling. If the Source (Water-In) temperature is inadequate for heating or cooling, the UVC does not use the water for heating or cooling.

Source (Water-In) Temperature Sensor

The Source (Water-In) Temp Differential (5°F/2.78°C default) configuration is used by the UVC to determine if the water can be used for heating or cooling. The Source (Water-In) Temp Differential is the minimum differential between water-in and room temperature before water is used for heating or cooling.

Network Source (Water-In) Temperature Capability

A Network Source (Water-In) temperature sensor can be configured using the Source (Water-in) Temp Input variable. When the Source (Water-In) Temp Input variable is used (valid value), it automatically overrides the hard-wired Source (Water-In) temperature sensor.

Source (Water-In) Temperature Sampling

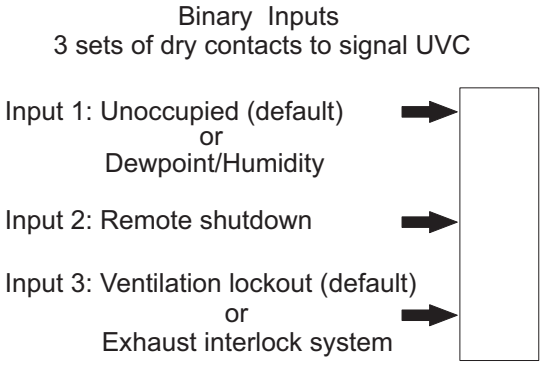
When heating or cooling is required, the UVC checks first to verify that the Source (Water-In) temperature is adequate for the desired mode. For face and bypass damper applications with an end-of-cycle valve, the valve opens but the face and bypass damper remains in the bypass position until the water temperature meets setpoint conditions. For valve control applications, the valve will stay at 10% open until water is deemed adequate.

If the water is deemed inadequate, the valve closes for the EWT RetryTime (default 120 minutes) before sampling again. If the demand for heating or cooling goes away, the unit samples the Source (Water-In) temperature again with the new call for heating or cooling.

External Binary Inputs

The UVC is provided with three binary inputs that provide the functions described below.

Figure 23: Binary Inputs



These inputs each allow a single set of dry contacts to be used as a signal to the UVC. Multiple units can be connected to a single set of dry contacts. For wiring examples, see MicroTech Unit Ventilator Controller IM 1286.

NOTE: Not all of the functions listed can be used at the same time. The UVC is provided with configuration parameters that can be adjusted to select which function is used for these inputs where multiple functions are indicated below.

External Binary Input 1

This input can be used only as an unoccupied signal.

Unoccupied Input Signal

This input allows a single set of dry contacts to be used to signal the UVC to go into unoccupied or occupied mode. When the contacts close, the UVC goes into unoccupied mode. When the contacts open, the UVC goes into occupied mode. Additional variables can effect occupancy mode and override this binary input. See “Occupancy Modes” on page 27.

Dewpoint/Humidity Input Signal (optional)

This input allows a single set of dry contacts to be used to signal the UVC to go into passive dehumidification. When the contacts close (high humidity), the UVC goes into dehumidification. When the contacts open (low humidity), the UVC stops dehumidification.

The device used must incorporate its own differential dewpoint or differential humidity.

External Binary Input 2

This input can be configured as an unoccupied (default) or dew point/humidity signal.

Remote Shutdown Input Signal

This input allows a single set of dry contacts to be used to signal the UVC to go into shutdown mode. When the contacts close (shutdown), the UVC goes into shutdown mode. When the contacts open the UVC returns to normal operation

External Binary Input 3

This input can be configured as a ventilation lockout (default) or exhaust interlock signal.

Ventilation Lockout Input Signal

This input allows a single set of dry contacts to be used to signal the UVC to close the OA damper. When the contacts close (ventilation lockout signal), the UVC closes the OA damper. When the contacts open, the UVC returns to normal OA damper operation.

Exhaust Interlock Input Signal

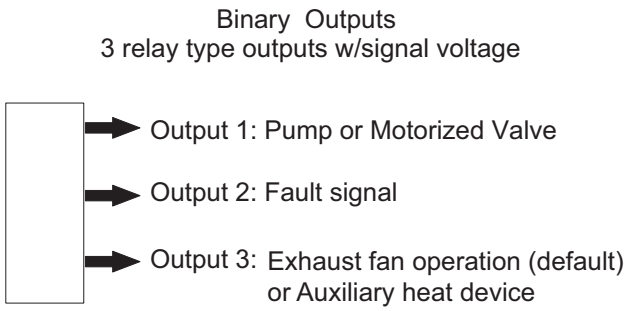
The exhaust interlock (biExhaustInterlock) forces the outdoor air damper to a configurable new minimum position (ncpOAMinPosExhaust), which has a default value of 100%. This function is active when the binary input (biExhaustInterlock) is triggered from either an open or closed signal from the exhaust fan.

The Faults, Unoccupied mode, Standby mode, and Emergency mode take precedent over the OAD interlock input signal. An example of this is if the exhaust interlock is active and the unit is in the Unoccupied mode, then the OA damper is closed.

External Binary Outputs

The UVC has three binary outputs that provide the functions described below.

Figure 24: Binary Outputs



These outputs are relay type outputs that are intended to be used with signal level voltages (24VAC maximum) only. For wiring examples, see MicroTech Unit Ventilator Controller IM 1286.

NOTE: Not all of the functions listed can be used at the same time. The UVC has configuration parameters that can be adjusted to select which function will be used for these outputs when multiple functions are indicated below.

External Binary Output 1

This relay output provides a normally open, normally closed, and common set of connections that can be used to signal the operation of the motorized valve or pump. The normally de-energized output will energize on a call for heating or cooling. The output will de-energize when the call for heating or cooling goes away.

External Binary Output 2

This binary output can be used as a fault signal.

Fault Signal

This output provides 24VAC signal that can be used to signal a fault condition. When a fault exists, the UVC energizes this relay output. When the fault or faults are cleared, the UVC de-energizes this relay output. This functionality can be reversed through the LUI keypad or ServiceTools software.

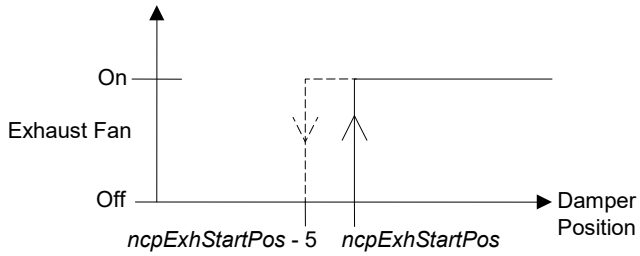
External Binary Output 3

This output can be used to operate an auxiliary heat device or signal exhaust fan operation.

Exhaust Fan ON/OFF Signal

This relay output provides a 24VAC output that can be used to signal the operation of an exhaust fan. The position of the OA damper may be used to energize a 3rd party exhaust fan. This logic uses the configurable point (ncpExhStartPos), which has a default value of (12%) to activate the exhaust fan when the outside air damper opens to the minimum OA position, (ncpOAMinPosExhaust). The exhaust fan output will de-energize when the OA damper goes below the ncpExhStartPos minus 5%.

Figure 25: Exhaust Fan Hystresis Diagram



Auxiliary Heat Signal

This output provides 24VAC signal that can be used to operate an auxiliary heat device. The UVC by default is configured to operate a normally closed auxiliary heat device (energize when heat is required), such as electric heat. However, the output polarity can be configured to use a normally open auxiliary heat device (de-energize when heat is required), such as a wet heat valve actuator with a spring setup to open upon power failure. This configuration can be performed through the LUI keypad or ServiceTools software.

Table 21: Auxiliary Heat Start/Stop Calculation

Start/Stop	Calculation
Auxiliary heat starts when:	Heat PI-Loop = saturated high (100%) for more than two minutes AND EffectiveControlTemp ≤ EffectiveHeatingSetpoint – AuxiliaryHeatStartDifferential
Auxiliary heat stops when:	EffectiveControlTemp ≥ (EffectiveHeatingSetpoint – AuxiliaryHeatStartDifferential) + AuxiliaryHeatStopDifferential

UVC Input and Output Table

All UVC input and output connections and their corresponding unit ventilator usage are shown in Table 22 on page 43.

Client/Server Overview

Client/Server configuration for Unit Ventilators allows for the coordinated functionality of multiple Unit Ventilators based in the inputs to a single Client unit. Commonly this is so that a single room sensor can be used to control multiple units. This is accomplished using a Client/Server Modbus communication network with a single room sensor connected to the Client unit which passes information to up to 9 Server units to synchronize their operation. In a Client/Server setup, the server units follow the client's mode and setpoints, but the servers operate independently based upon their own locally installed sensors (such as entering water temperature or entering water temperature). The Client/Server network has only one Client and each of the Server units will need to be configured with a unique address to ensure proper functionality. For information on how to install the Client/Server communication wiring, refer to IM1286 'MicroTech Unit Ventilator Controller Installation'.

Server Unit Setup

The configuration of the Server units can be accomplished through the LUI keypad or ServiceTools software. While the points' names are different in the LUI keypad and ServiceTools, they represent the same point in the unit controller.

To configure a unit as a Server through the LUI keypad go to Set > Set-Modbus, and change 'SrvCIntTyp' to 'Server' and change 'MbAddr' to a unique value between 2-10.

To configure a unit as a Server through ServiceTools go to Network > Modbus and change 'Server/Client' Configuration to 'Server' and change 'Modbus Address' to a unique value between 2-10.

NOTE: If there are multiple Server units with the same MbAddr/Modbus Address value, the Client/Server network will not function properly.

Client Unit Setup

The configuration of the Client unit can be accomplished through the LUI keypad or ServiceTools software. While the points names are different in the LUI keypad and ServiceTools, they represent the same point in the unit controller.

To configure a unit as a Client through the LUI keypad go to Set > Set-Modbus, and change 'SrvCIntTyp' to 'Client' and change 'MbAddr' to 1.

To configure a unit as a Client through ServiceTools go to Network > Modbus and change 'Server/Client' Configuration' to 'Client' and change 'Modbus Address' to 1.

NOTE: If there are multiple Client units on the same Modbus trunk, or if the Client unit has a MbAddr/Modbus Address value other than 1, the Client/Server network will not function properly.

Server Unit Discovery

After connecting the Modbus communication wiring between all the devices and setting up the Client and all Server units, a Modbus Discovery should be performed through the Client unit to establish communication with all Server units. This can be accomplished through the LUI keypad or ServiceTools Software. While the points names are different in the LUI keypad and ServiceTools, they represent the same point in the unit controller.

To perform a Modbus Discovery through the LUI keypad on the Client unit, go to Set > Set-Modbus and change 'Discover' from 'Off' to 'On'. Once the Modbus Discovery is complete (up to 20 seconds), confirm that the MbNumDev value equals the number of Server units connected.

To perform a Modbus Discovery through ServiceTools software go to Network > Modbus and change 'Enable Network Discovery' from 'Off' to 'On'. Once the Modbus Discovery is complete, confirm that the 'Number of Modbus Servers' value equals the number of Server units connected.

Adding a Server Unit to a Client/Server Network

The following describes how to add an additional Server unit to an existing Client/Server network. Install the new Server unit and connect the communication wire. Give the unit as a Server as described in the **Server Unit Setup** section, and the perform a Modbus Discovery using the Client unit as described in the **Server Unit Discovery** section.

Removing a Unit from a Client/Server Network

The following describes how to remove a unit from an existing Client/Server network. Disconnect the Client/Server communication wire. On the LUI keypad, change the 'SrvCIntTyp' to 'None', or using ServiceTools software, change the 'Client/Server Configuration' to 'None'.

If the unit being removed is a Server unit, perform a Modbus Discovery using the Client unit as described in the **Server Unit Discovery** section.

If the unit being removed is the Client unit, one of the Server units will need to be setup as the Client (and be connected to the common room sensor if applicable), or all the Server units will need to be reconfigured for independent operation.

UVC Inputs and Outputs

Table 22: UVC Inputs and Outputs

Terminal	Software I/O	Signal Type	UV Function
PWM			
H2-1	PWM 1	80Hz Cycle	Supply Fan
H2-2	PWM 2	80Hz Cycle	
Analog Outputs			
H3-1	AO 1	0-10VDC Out	OA Damper
H3-2	AO 2	0-10VDC Out	F&B Damper
H3-3	AO 3	0-10VDC Out	Modulating Cooling Valve
H3-4	AO 4	0-10VDC Out	Modulating Heating Valve
Binary Inputs			
H4-1	BI 5	Discrete BI	Boilerless Indication
H4-2	BI 6	Discrete BI	Ventilation Lockout
H5-1	BI 1	24VAC BI	High Pressure
H5-2	BI 2	24VAC BI	Freeze Stat
H5-3	BI 3	24VAC BI	Configurable
H5-4	BI 4	24VAC BI	Configurable
Room Sensor Inputs			
H6-1	BI 7	Discrete BI	Occupancy
H6-2	BI 8	Discrete BI	Shutdown
H6-3	BO Status LED	Binary Output	Status LED
H6-4	AI 1	0-1.5K Pot	Setpoint
H6-5	AI 2	0-1.5K Pot	Unit Mode
H6-6	AI 3	0-1.5K Pot	Fan Speed
H6-7	AI 4	10K Type II Thermistor	Space Temperature
H6-8		GND	GND
Analog Inputs			
H7-1		5VDC	Sensor Power
H7-2	AI 5	0-5 VDC Signal	Indoor Humidity Signal
H7-3		GND	Sensor Ground
H8-1		5VDC	Sensor Power
H8-2	AI 6	0-5 VDC Signal	Outdoor Humidity Signal
H8-3		GND	Sensor Ground
H9-1	AI 7	10K Type II Thermistor	Discharge Air Temperature
H9-2		GND	Sensor Ground
H9-3	AI 8	10K Type II Thermistor	Return Air Temperature
H9-4		GND	Sensor Ground
H10-1	AI 9	10K Type II Thermistor	Outdoor Air Temperature
H10-2		GND	Sensor Ground
H10-3	AI 10	10K Type II Thermistor	Outdoor Coil Refrigerant/ Entering Water Temperature
H10-4		GND	Sensor Ground
H11-1	AI 11	10K Type II Thermistor	Leaving Water
H11-2		GND	Sensor Ground
H11-3	AI 12	10K Type II Thermistor	Indoor Coil Refrigerant/Suction Refrigerant Temperature
H11-4		GND	Sensor Ground
H11-5	AI 13	Conductivity	Condensate
H12-1	AI 14	0-10VDC Input	CO_2/VOC
H12-2	AI 15	0-10VDC Input	
H12-3	AI 16	0-10VDC Input	

Terminal	Software I/O	Signal Type	UV Function
Binary Outputs			
DO1	DO1	24VAC Output	Fan Low/ECM Signal
DO2	DO2	24VAC Output	Fan Medium
DO3	DO3	24VAC Output	Fan High
DO4	DO4	24VAC Output	Reversing Valve/ 2 Position Heating Valve
DO5	DO5	24VAC Output	Fault Indication
DO6	DO6	24VAC Output	Outdoor Fan Signal
DO7	DO7	24VAC Output	Exhaust Fan Signal/Auxillary Heat
DO8C		24VAC or Dry Contact Common	24VAC or Dry Contact Common
DO8-NO	DO8	Normally Open Output	Pump or Motorized Valve NO
DO8-NC	DO8	Normally Closed Output	Pump or Motorized Valve NC
DO9, 10, 11 C		24VAC or Dry Contact Common for 3 outputs	Electric heat 24VAC Common
DO9	DO9	24VAC or Dry Contact Output	Electric Heat Stage 1
DO10	DO10	24VAC or Dry Contact Output	Electric Heat Stage 2
DO11	DO11	24VAC or Dry Contact Output	Electric Heat Stage 3
DO12, 13, 14 C		24VAC or Dry Contact Common for 3 outputs	24VAC Common
DO12	DO12	24VAC or Dry Contact Output	Compressor 1/2 position Cooling Valve
DO13	DO13	24VAC or Dry Contact Output	Compressor 2
DO14	DO14	24VAC or Dry Contact Output	Drain Pan Heater

Trending Parameters

If the UVC has an optional SD card installed, data trending can be enabled to capture historical operational data. The rate at which the data is recorded can be configured to time intervals of 1 minute, 10 minutes, hourly, or daily, or based on a change in occupancy mode. This configuration can be changed through the LUI keypad or ServiceTools software.

The data is captured in a .csv file format and saved to the SD card. This data can accessed by removing the SD card from the UVC and inserting it into an appropriate SD card reader. A separate trend file is created for each day. Refer to Table 23 for the comprehensive list of all parameters supported by trending.

Table 23: Trending-Supported Parameters

Parameter	Description
AirTmprgMode	Air Tempering Mode. Enables air tempering if the DAT (discharge air temperature) is less than the occupied heating setpoint and the unit is not in an unoccupied state
Alarm1_Date	Alarm Date. Day, month, and year of active alarm occurrence
Alarm1_Descr	Alarm Description. Describes the type of alarm (ex, High DX Pressure) or No Alarm
Alarm1_Time	Alarm Date. Hour, minute, and second of alarm occurrence
Alarm1_Type	Alarm Type. Category of alarm (Problem, Fault, Warning)
AlarmStatus	Alarm Status. Active alarm(s) status
AllowCool	Allow Cooling. Status of cooling-enable function
AllowDehumid	Allow Dehumidification. Status of dehumidification-enable function
AllowHeat	Allow Heating. Status of heating-enable function
NetAppMode	Network Application Mode. BAS-commanded input that determines the unit heat/cool mode
ClgSpt	Cooling Setpoint. Current cooling setpoint the unit is controlling to
CO2	CO_2 analog input setpoint
CldWtr	Cold water valve position
ColdWtrPI	Cold water PI loop output
CmpAirTmprg	Compressor Air Tempering. Indicates if compressor air tempering mode is heating to control to the DAT under certain conditions
ClOATLckStat	Cooling Outdoor Air Temperature Lockout Status. Current state of OAT compressor cooling lock-out on ASHPs
CmpClAvl	Compressor Cooling Available. Indicates if compressor cooling can be enabled
CmpHtAvl	Compressor Heating Available. Indicates if compressor heating can be enabled
NetCompEn	Network Compressor Enable. BAS-commanded compressor enable parameter
CmpHtEWTLckSt	Compressor Heating Entering Water Temperature Lockout Status. Current state of EWT compressor heating lock-out function
CmpHtOATLckSt	Compressor Outdoor Air Temperature Lockout Status. Current state of OAT compressor heating lock-out function
CmpStgCmd	Compressor Stage Command. Indicates if cooling stages are controlled by the compressor
CondOverflw	Condensate overflow. Indicates wet or dry if sensor is installed
CntrlTmp	Control Temperature. Selected temperature from either a space or return air sensor
CntrlTmpStat	Control Temperature Status (heat, cool, between or invalid)
ClVlv	Cooling valve position
ClStgChg	Cooling Stage Change. Cooling is commanded to stage up
DAT	Discharge Air Temperature
aiDAT	DAT from sensor input
DATClgSpt	DAT Cooling Setpoint
NetDATClgSpt	Network Discharge Cooling Setpoint. BAS-commanded discharge air cooling setpoint
DATRstClin	DAT Cooling Reset control value
DATRstHtin	DAT Heating Reset control value
DATRstHtIn	DAT Heating Reset input used to determine control value
niDATRstHtIn	Network DAT Heating Reset. BAS-commanded parameter
DATDehumSpt	DAT Dehumidification Setpoint
DATHtgSetpt	DAT Heating Setpoint
NetDATHtgSpt	Network DAT Heating Setpoint. BAS-commanded parameter
DATHotWtr	DAT Hot Water lower limit PI loop output
DATReHtSpt	DAT Heating Reheat Setpoint
DATSpt	DAT Setpoint
DfrstSt	Defrost State
DehumAvl	Dehumidification Available. Indicates if dehumidification can be enabled
DehumidEnabled	Dehumidification Enabled. LUI keypad or network command
DAHiLimMode	Discharge Air High Limit Mode. Active if DAT is greater than this setpoint and unit is in heating mode
NetEconEn	Network Economizer Enable. BAS-commanded parameter
EconMode	Economizer Mode. Current mode of the outside air damper
EffHeatCool	Effective Heat Cool. Actual heat/cool mode of the unit
EffHtClNone	Effective Heat Cool None. Indicates unit mode is heat, cool, or none
EffHum	Effective Humidity. Current humidity status of the space as either humid or not humid
EffectOcc	Effective Occupancy. Current occupancy mode of the unit
EffSpt	Effective Setpoint. Temperature setpoint the unit is currently controlling to
EffEWT	Effective Entering Water Temperature
EffOutRH	Effective Outdoor Air Relative Humidity
EffOAT	Effective Outdoor Air Temperature
EffSpcCO2	Effective Space CO_2 value of indoor space
EffSpaceRH	Effective Space Relative Humidity level of indoor space
ElDatLLPIOut	Electric Heat DAT Lower Limit PI loop output
ElectDehumPIOut	Electric Heat Dehumidification lower limit PI loop output
ElHtStgOut	Electric Heat Stage Output. Number of currently active electric heat stages
ElectHtAvl	Electric Heat Available. Indicates if electric heating can be enabled
NetEmergOv	Network Emergency Override. BAS-commanded emergency override input
EnergHold	Energy Hold-off. Status of energy hold-off state. Prevents unit from heating/cooling except in the event of extreme temperatures
NetEnergHold	Network Energy Hold-off. BAS-commanded energy hold-off parameter
EWT	Entering Water Temperature setpoint
niEWT	Entering Water Temperature. BAS-commanded input
FanCntMth	Fan Control Method. Determines how the indoor fan is being controlled
CurFanSpd	Current Indoor Fan Speed
NetFanSpdCmd	Network Fan Speed Command. Indoor fan speed setpoint input from the BAS
FB_PIOut	Face and Bypass Damper PI loop output
FBDamper	Face and Bypass Damper position
FBP	Face and Bypass Damper position analog output
FreeClAvl	Free Cooling Available. Indicates if free cooling is currently available
FreeClEn	Free Cooling Enabled. Indicates if free cooling is allowed to be enabled
FreeClCmd	Free Cooling Command
SpcTmp	Space Temperature. Sensor-controlled space temperature (without tenant override)
HtgCOVlv	Heating Valve. Valve position analog output
HtgStgChg	Heating Stage Change. Indicates if heating is commanded to stage down
HH:MM:SS	Time of trend point generation
HotWtr	Hot Water. Hot water valve position
HtWtrPI	Hot Water PI. Hot water valve PI loop output
HtgSpt	Heating Setpoint. Current heating setpoint the unit is controlling to
HumIn	Humidity Input. Indoor air relative humidity analog input
HumOut	Outdoor Humidity. Outdoor air relative humidity analog input
HydroClAvl	Hydronic Cooling Available. Indicates if hydronic cooling is available to be enabled
HydroClCmd	Hydronic Cooling Command
HydroHtAvl	Hydronic Heating Available. Indicates if hydronic heating is available to be enabled

Parameter	Description
HydroHeatingCmd	Hydronic Heating command
InCoilTmp	Indoor Coil Temperature
InEnth	Indoor Enthalpy. Determined by space temperature and indoor air humidity
IntSched	Internal Schedule. Result of the user-defined daily occupancy schedule
LowOAFrzStat	Low Outdoor Air Freeze Status. Indicates OAT freeze protection status as active or not active
KeyEmergOv	LUI Display Emergency Override. Command set from the local user interface
LuiEnergyHoldOff	LUI Energy Hold-off. Command set from the local user interface
KeyOccManCmd	LUI Occupancy Manual Command. Occupancy override set from the local user interface
LuiSetptOffset	LUI Setpoint Offset. Setpoint offset adjustment set from the local user interface
KeySysStat	LUI System Status. Current heat/cool status set from the local user interface
LWT	Leaving Water Temperature
aiLWT	Leaving Water Temperature sensor input
MM/DD/YYYY	Date of trend point generation
MSM	Main State Machine. Function of the controller used to monitor unit state
NetOccManCmd	Network Occupancy Command. BAS-commanded occupancy override parameter
MultAlarmComp	Multiple Alarm Compressor. Activates when one or more compressor alarms is generated
OADpos	Outdoor Air Damper Position
OADmpr	Outdoor Air Damper position analog output
NetOADIn	Network Outdoor Air Damper Input. OAD position configured for client/server control strategy
OADAutoPos	Outdoor Air Damper Automatic Position. Maximum value of the OAD setpoint and free cooling calculation
OADLowTmpStat	Outdoor Air Damper Low Temperature Status
niOADMinPos	Network Input Outdoor Air Damper Minimum Position. BAS-commanded outdoor air damper position; overrides local control if configured
OADMinPos	Outdoor Air Damper Minimum Position. Minimum OAD position for span fan operating at high speed, or at any speed if CO_2/DCV is enabled.
OADPosCO2	Outdoor Air Damper Position for CO_2
OADPosFreeCl	Outdoor Air Damper Position for Free Cooling
OADPosReset	Outdoor Air Damper Position for hard-wired reset
OAMinPosLowSpd	Outdoor Air Damper Position Low Speed. Minimum OAD position for space fan operating at low speed
OAMinPosMedSpd	Outdoor Air Damper Position Medium Speed. Minimum outdoor air damper position for space fan operating at medium speed
OAT	Outdoor Air Temperature
niOAT	Network Input Outdoor Air Temperature. BAS-commanded input
OccClSpt	Occupied Cooling Setpoint

Parameter	Description
LonOccClSptSh	Occupied Cooling Setpoint Shift from LonWorks (future use)
LonStdClSptSh	Standby Cooling Setpoint Shift from LonWorks (future use)
OccHtSpt	Occupied Heating Setpoint
LonOccHtSptSh	Occupied Heating Setpoint Shift from LonWorks (future use)
LonStdHtSptSh	Standby Heating Setpoint Shift from LonWorks (future use)
NtOccSched	Network Occupancy Schedule. BAS-commanded occupancy schedule
NetOccSens	Network Occupancy Sensor. Occupancy control from BAS-commanded room sensor
OutCoilTmp	Outdoor Air Coil Temperature
OutEnth	Outdoor Enthalpy. Output based on current outdoor air temperature and outdoor air humidity
niOutRH	Outdoor Air Relative Humidity input
pwmECMSupplyFan	ECM Supply Fan output
RAT	Return Air Temperature from unit-mounted room/return air sensor
RevValveCmd	Reversing Valve Command. Current valve command to either heating or cooling
RSFanSpd	Remote Sensor Fan Speed (auto, low, medium, high, off) determined by sensor input
RSSysMode	Remote Sensor System Mode. Status (auto, heat, cool) determined by sensor input
Setpoint	Setpoint value
netSetpoint	Network Setpoint. BAS-commanded setpoint value
SptAdj	Setpoint Adjust. Temperature setpoint adjust analog input
LocSptShft	Local Setpoint Shift. Setpoint adjustment from the room sensor
SptOffAdj	Setpoint Offset Adjustment
NetSptOffst	Network Setpoint Offset. BAS-commanded setpoint offset
niSpcCO2	Space CO_2 Input. BAS-supplied space CO_2 input used to determine effective space CO_2
SpcCO2Lim	Space CO_2 Setpoint
niSpcRH	Space Relative Humidity Network Input
SpaceTmp	Effective Space Temperature
SpcTmp	Space Temperature from hard-wired input
niSpcTmp	Space Temperature from BAS-commanded space temperature input
SpcTmpTO	Space Temperature with Tenant Override input
SysStatCmd	System Status Command. Unit heat/cool command
SZVavFanPI	Single-Zone VAV Fan speed PI loop output
NetInAlarm	Highest priority active alarm
ValveFrzProtect	Valve Freeze Protection strategy

UVC Configuration Parameters

The UVC is been provided with a number of configuration variables as listed in the following table. These configuration variables are stored in UVC non-volatile memory. For a description of supported network variables, refer to Unit Controller Protocol Information ED 19110.

Table 24: UVC Configuration Parameters

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
KeyInFan	AUTO, LOW, MEDIUM, HIGH (AUTO)		0	3	0	Manually controls the indoor fan if no overrides are present. The parameter is provided for use by the LUI
KeyAppMode	AUTO, HEAT, COOL, NIGHT_PURGE, OFF, EMERG_HEAT, FAN_ONLY, DEHUMID (AUTO)		0	7	0	Indicates the LUI commanded heat/cool mode of the unit. This parameter is used only if niApplicMode is NULL or AUTO
KeyOccManCmd	OCC, UNOCC, BYPASS, STANDBY, AUTO (AUTO)		0	4	4	LUI occupancy override input
KeyEmergOv	NORMAL, PRESSURIZE, DEPRESSURIZE, PURGE, SHUTDOWN, FIRE (NORMAL)		0	5	0	This variable has the emergency overrides from the LUI
EconEn	DISABLE, ENABLE, (ENABLE)		0	1	1	Allows the LUI to enable/disable the economizer. This is referenced when niEconEnable is NULL
KeySptOfstSel	AUTO, ACTIVE (AUTO)		0	1	0	When set to ACTIVE then the LUI controls the setpoint offset unless controlled by network
KeySptOffset	-5°F to +5°F		-5	5	0	Setpoint offset value that the LUI can write. This is used in the SetptOffset calculation
Setpoints						
OccClSpt	61°F to 86°F	OCS	61	86	73	Occupied Cooling Setpoint
StdbyClSpt	61°F to 86°F	SCS	61	86	77	Standby Cooling Setpoint
UnoccClSpt	61°F to 86°F	UCS	61	86	82	Unoccupied Cooling Setpoint
OccHtSpt	50°F to 82°F	OHS	50	82	70	Occupied Heating Setpoint
StdbyHtSpt	50°F to 82°F	SHS	50	82	66	Standby Heating Setpoint
UnoccHtSpt	50°F to 82°F	UHS	50	82	61	Unoccupied Heating Setpoint
CntrlTmpSel	SPACE, RAT, AISR_AVG (SPACE)		0	2	0	Selects the control temp source; the space temp, the return air temp or the average of the hardwareSpaceTemp and aiRAT. This sets ControlTemp
OccDiff	1°F to 10°F (1°F)		1	10	1	Applies to Occupied, Bypass and Standby modes: The stage 1 cooling off setpoint is the EffectSetpt minus this amount. The stage 1 heating off setpoint is the EffectSetpt plus this amount
UnoccDiff	1°F to 10°F (1°F)		1	10	1	Applies to Unoccupied mode: The stage 1 cooling off setpoint is the EffectSetpt minus this amount. The stage 1 heating off setpoint is the EffectSetpt plus this amount
BypassTime	0 min to 480 min		0	480	120	Local Bypass Time
SptMeth	Easy, Advanced (Advanced)		0	1	1	Sets method for calculating the setpoints
SpcRHSpt	10% RH to 100% RH	RHS	10	100	60	Space humidity setpoint
SpcRHSptOffDif	1% RH to 50% RH		1	50	5	Space humidity differential setpoint
DATRstHtSel	NONE, NETWORK, SPACE, RETURN, OAT (SPACE)		0	4	2	Selects the source of DATControlTempHtg used in the DATHtgSetpt reset calculation
DATRstClSel	NONE, NETWORK, SPACE, RETURN, OAT (SPACE)		0	4	2	Selects the source of DATControlTempClg used in the DATClgSetpt reset calculation
DATClSpt	-40°F to 212°F (55.0°F)		-40	212	55	Sets DATControlTempClg when cpDATResetClgSel is NONE.
DATHtSpt	-40°F to 212°F (85.0°F)		-40	212	85	Sets DATControlTempHtg when cpDATResetHtgSel is NONE
MnDATClSpt:	40°F to 100°F (55.0°F)		40	100	55	Used in DAT reset calculation when cpDATResetClgSel is RETURN, SPACE or OAT
MxDATClSpt:	40°F to 100°F (65.0°F)		40	100	65	Used in DAT reset calculation when cpDATResetClgSel is RETURN, SPACE or OAT

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
MnDATClCntSpt	-40°F to 212°F (75.0°F)		-40	212	75	Used in DAT reset calculation when cpDATResetClgSel is RETURN, SPACE or OAT
MxDATClCntSpt	-40°F to 212°F (78.0°F)		-40	212	78	Used in DAT reset calculation when cpDATResetClgSel is RETURN, SPACE or OAT
MnDATHtSpt	40°F to 140°F (80.0°F)		40	100	80	Used in DAT reset calculation when cpDATResetHtgSel is RETURN, SPACE or OAT
MxDATHtSpt	40°F to 140°F (120.0°F)		40	100	120	Used in DAT reset calculation when cpDATResetHtgSel is RETURN, SPACE or OAT
MnDATHtCntSpt	-40°F to 212°F (67.0°F)		-40	212	67	Used in DAT reset calculation when cpDATResetHtgSel is RETURN, SPACE or OAT
MxDATHtCntSpt	-40°F to 212°F (70.0°F)		-40	212	70	Used in DAT reset calculation when cpDATResetHtgSel is RETURN, SPACE or OAT
DATClDb	1°F to 5°F (2.0°F)		1	5	2	DAT Cooling Setpoint Deadband
DATHtDb	1°F to 5°F (2.0°F)		1	5	2	DAT Heating Setpoint Deadband
DAEconLL	45°F to 65°F	VCLL	45	65	54	DAT Ventilation Cooling Low Limit Setpoint
DAMechLL	35°F to 65°F	MCLL	35	65	45	DAT Mechanical Cooling Low Limit Setpoint
DATLLAlTmSpt	1 to 10 minutes		1	10	3	When DAT ≤ ncpDisAirEconLowLim, this configures how long all heating stages have to be on before the DATLLAlarm alarm becomes active
RehtLLStTime	1 to 10 minutes		1	10	3	When in the Reheat state, this configures how long the OAD has to be at minimum before it will advance to the Reheat Low Limit state
DAHiLim	80°F to 135°F	DAHL	80	135	125	Discharge Air High Limit
CmpMtrVlvTm	0 sec to 60 sec		0	60	30	Motorized Valve Delay
EWTFbAlrDly	1 to 10 minutes (5 minutes)		1	10	5	After delay activate either Can'tCoolAlarm or Can'tHeatAlarm alarm if EffEWT is not suitable
FBPMinPos	0 to 100% (0%)		0	100	0	Face and bypass minimum position with 2 position valve
SrcTmpDiff	0°F to 10°F (5°F)		0	10	5	Source (Water-in) Temp Differential specifies the minimum differential required between space temperature and EffEWT to allow hydronic heating or cooling
EOCLowOASpt	20°F to 36°F (34°F)	EOCS	20	36	34	If the outdoor air temperature is below this setpoint, and the face and bypass damper is closed, the EOC valve is opened regardless of space temperature. This is done to prevent freezing coils
EWFlwTmSpt	0 sec to 600 sec. (120 sec)		0	600	120	2 Pipe units must flow for this long before HydroCoolAvail or HydroHeatAvail can be set to available
ClStgTmSpt	1 to 5 min (3 min)		1	5	3	Minimum time that cooling stage has to be active before a stage change can occur
HtStgTmSpt	1 to 5 min (3 min)		1	5	3	Minimum time that heating stage has to be active before a stage change can occur
ElHtStgTmSpt	1 to 120 sec (60 sec)		1	120	60	Minimum time that electric heat stage has to be active before a stage change can occur
cpMinStgTime	3 minutes		1	5	3	Minimum time that it must remain in a heating/ cooling/dehumidification state
MnElHtFanOnTm	0 to 240 sec (60 sec)		0	240	60	Minimum time to leave Fan on after leaving electric heat state
DehumFanSpt	0% to 100% (40%)		0	100	40	Initial indoor fan speed when dehumidification is entered
SupElHtSel	DISABLE, ENABLE (ENABLE)		0	1	1	Enable electric heat to supplement the primary heat
FltrChgHrsSpt	50 hrs to 2000 hrs (700.0 hrs)		50	2000	700	This cp is the setpoint for the filter change alarm
FltrChgHrsEn	DISABLE, ENABLE (DISABLE)		0	1	0	This cp enables or disables the filter change alarm function
FanChgsPerHr	1 to 60		1	60	6	This cp is used to set the number of fan changes allowed per hour. Setting the cp to a value of six means the fan speed can change once every 10 minutes
ExhStrtPos	0% to 100% (12%)	OADE	0	100	12	Energize Exhaust Fan /OAD Position Setpoint
EmergHtEn	DISABLE, ENABLE (ENABLE)		0	1	1	Emergency Heat Enable

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
EmergHtSpt	0°F to 70°F	EHS	0	70	54	Emergency Heat Setpoint
PI Parameters						
FBDPropGn	0.0 to 255.0		0	255	10	Face and Bypass proportional PI loop configuration
FBDIntgGn	0.0 to 255.0		0	255	1	Face and Bypass integral PI loop configuration
EconPropGn	0.0 to 255.0		0	255	1	Primary cool proportional gain
EconIntgGn	0.0 to 255.0		0	255	0.1	Primary cool integral Time
ClPropGn	0.0 to 255.0		0	255	0.5	Hydro cooling valve proportional gain
ClIntgGn	0.0 to 255.0		0	255	0.02	Hydro cooling valve integral Time
ClMnPos	0% to 100%		0	100	20	Output when temperature delta is zero
ClMxDeltaTmp	1 to 10°F		1	10	5	The delta between control and target temperatures to cause the valve to open 100%
ClMxPos	10% to 100%		10	100	100	Output when temperature delta is Max Delta Temp
HtPropGn	0.0 to 255.0		0	255	0.5	Heating Valve Proportional gain
HtIntgGn	0.00 to 255.00		0	255	0.02	Heating Valve Integral Time
HtgMnPos	0% to 50%		0	50	0	Output when temperature delta is zero.
HtMxDeltTmp	1°F to 10°F		1	10	5	The delta between control and target temperatures to cause the valve to open 100%.
HtMxPos	10% to 100%		10	100	100	Output when temperature delta is Max Delta Temp.
ElHtPropGn	0.0 to 255.0		0	255	8	Electric heat proportional gain
ElHtIntgGn	0.0 to 255.0		0	255	0.5	Electric heat integral time
CO2PropGn	0.0 to 255.0		0	255	0.1	OAD control for CO_2 proportional gain
CO2IntgGn	0.0 to 255.0		0	255	0.01	OAD control for CO_2 Integral Time
SZnVAVMxDelta	1°F to 10°F		1	10	5	Used with single zone VAV PI loop
SZnVAVMnFan	0% to 100%		0	100	5	Used with single zone VAV PI loop
SZnVAVMxFan	0% to 100%		0	100	100	Used with single zone VAV PI loop
SZnVAVPropGn	0 to 255		0	255	0.1	Used with single zone VAV PI loop
SZnVAVIntgGn	0 to 255		0	255	0.01	Used with single zone VAV PI loop.
OADLLPropGn	0.0 to 255.0		0	255	2	Configuration for PI loops proportional value
OADLLIntgGn	0.0 to 255.0		0	255	0.2	Configuration for PI loops integral value
Fan						
FanOffDel	0 sec to 10 sec)		0	10	4	Sets the space fan off delay
FanCycling	CONTINUOUS, CYCLING (CONTINUOUS)		0	1	0	While not in unoccupied mode, this input determines if the space fan may run continuously without heating or cooling demand. LONWORKS Note: nciFanCycling: The fan cycles when the cp is set to three, and the fan is continuous when the cp is set to two
PWMLow	50% to 80%		50	80	75	The percent speed for PWM low fixed speed
PWMMed	70% to 90%		70	90	90	The percent speed for PWM medium fixed speed
PWMHigh	80% to 100%		80	100	100	The percent speed for PWM high fixed speed
FanRunTm	0.0 hrs to 300,000.0 hrs		0	300,000		This output show the fan run time in hours. It must have resolution of 0.1 hours and have a range of at least 300,000 hours
FltrChgHrs	0 to 300,000.0 hours		0	300,000		Current filter change hours. Keeps track of the number of hours that the fan has run with the filter. This parameter is saved in non-volatile memory
BrkptAutoLow	5% to 100%		5	100	5	The percent speed transition point for low fan
BrkptAutoMed	5% to 100%		5	100	75	The percent speed transition point for medium fan
BrkptAutoHi	5% to 100%		5	100	95	The percent speed transition point for high fan
BrkptAutoDiff	2% to 20% (2%)		2	20	2	The percent speed transition point differential. This value is added when going up in speed

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
OA Damper						
OADMnPos	0% to 100%	OADH	0	100	20	Minimum OA Damper Position for CO_2 control or space fan in high speed
OADMnPosMdSpd	0% to 100%	OADM	0	100	25	Minimum OA Damper Position for space fan in medium speed
OADMnPosLwSpd	0% to 100%	OADL	0	100	30	Minimum OA Damper Position for space fan in low speed
SpcCO2Lim	0 PPM to 2000 PPM	CO_2S	0	2000	1200	Space CO_2 Setpoint
EconOASpt	0°F to 70°F		0	70	9	ControlTemp must be less than EffOutdoorTemp plus this setpoint for free cooling to be available
EconDdDiff	1°F to 10°F	ETD	1	10	2	Economizer IA/OA Temp Differential
EconEnthSpt	5 BTU/# to 50 BTU/#	EES	5	50	29	OutdoorEnthalpy must be less than this setpoint for freecooling to be available
EconEnthDiff	0 BTU/# to 10 BTU/#	EED	0	10	1	Economizer IA/OA Enthalpy Differential
OAMxPos	0% to 100%		0	100	100	Maximum OA Damper Position
OALockEn	DISABLE, ENABLE (DISABLE)		0	1	0	Enable/Disable Low OA Temperature lockout for the OA Damper
OALockSpt	25°F to 45°F	OALS	25	45	36	Low OA Temperature lockout setpoint for the OA Damper
OATSpt	-40°F to 80°F	ETS	-40	80	68	Economizer OA Temp Setpoint
OADCloseDly	0 sec to 60 sec		0	60	30	Outdoor air damper close after supply fan off delay
OAMnPosExIlck	0% to 100% (100%)	EOAD	0	100	100	Minimum OA Damper position when exhaust interlock is active
Unit Configuration						
TrendRate	NONE, OCC_CHANGE, 1_MINUTE, 10_MINUTES, HOURLY, DAILY (NONE)		0	5	0	Defines when all trend data needs to be recorded onto the SD card.
CompType	NONE, COOL, ASHP, WSHP, (NONE)		0	3	0	NONE: No compressor COOL: Cooling only ASHP: Air Source Heat Pump, cooling and heating WSHP: Water Source Heat Pump, cooling and heating"
ValveType	NONE, 2POS_HEAT, 2POS_COOL, 2POS_BOTH, MOD_HEAT, MOD_COOL, MOD_BOTH, (2POS_HEAT)		0	6	1	NONE: valve not installed. 2POS_HEAT: 2 position valve, heat only. 2POS_COOL: 2 position valve, cool only. 2POS_BOTH: 2 position valve, heat & cool. MOD_HEAT: modulated valve, heat only. MOD_COOL: modulated valve, cool only. MOD_BOTH: modulated valve, heat & cool."
WtrPipes	NONE, 2_PIPE, 4_PIPE, (2_PIPE)		0	2	1	A 2 pipe system combines hot and cold water into 2 pipes. A 4 pipe system has separate pipes for each.
FBDmprEn	DISABLE, ENABLE (DISABLE)		0	1	0	Enables the Face and Bypass functionality. Set to ENABLE if installed.
ElHtStgs	0, 1 ,2, or 3 (0)		0	3	0	Defines how many stages of electric heat are available. UV has either 0 to 3.
SpltSysSel	NON_SPLIT, SPLIT (NON_SPLIT)		0	1	0	Defines if the unit is a split system
FanRstSel	SINGLE_DAT, CO_2, AI_INPUT (SINGLE_DAT)		0	2	0	Specifies which reset input should control the indoor fan. CO_2: controlled by a network or hardwired CO_2 sensor (aiCO_2). AI_INPUT: the hardwired reset input (aiCO_2) to control the indoor fan. SINGLE_DAT: Single zone DAT controls the indoor fan."
InFanSel	3_FIXED, ECM_MODBUS, PWM, PWM_3FIXED (3_FIXED)		0	3	0	3_FIXED: 3 Fixed speeds using discrete out, ECM_MODBUS :ECM using MODBUS communications, PWM: PWM output.
SpcTmpSens	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	1	Configures if the sensor is installed.
CondOFlwSn	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	0	Configures if the sensor is installed.
OATSens	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	1	Configures if the sensor is installed.
LWTSens	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	1	Configures if the sensor is installed.
InHumSens	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	0	Configures if the sensor is installed.

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
OutHumSens	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	1	Configures if the sensor is installed.
RATSens	NOT_INSTALLED, INSTALLED (INSTALLED)		0	1	1	Configures if RAT sensor is installed.
RemSptAdjType	DIFF, ABS (ABS)		0	1	1	"Wall Sensor Type. DIFF: (LONWORKS: Log_Off): use 3°F Diff, ABS: (LONWORKS: Log_ON): use 55°F to 85°F Adjust."
SpcRHEn	DISABLE, ENABLE (DISABLE)		0	1	0	Space Humidity Sensor Enable
OutRHEn	DISABLE, ENABLE (DISABLE)		0	1	0	Outdoor Humidity Sensor Enable
EconSel	NONE, DIFF_TEMP, OUTDOOR_ENTH, ENTH_ COMPARE (DIFF_TEMP)		0	3	1	"Specifies strategy for determining when free-cooling is available. DIFF_TEMP: Compare OAT to space temp. OUTDOOR_ENTH: using OAT and the outside humidity ENTH_COMPARE: Compare outdoor enthalpy to indoor enthalpy using OAT and outdoor humidity versus space temperature and indoor humidity."
KeyDehumEn	DISABLED, ENABLED (ENABLED)		0	1	1	Specifies if the LUI enables or disables dehumidification.
DehumType	ACTIVE, PASSIVE (ACTIVE)		0	1	0	"Type of Dehumidification. ACTIVE: Using water or compressor (depending on availability), PASSIVE: The air is not reheated. Note: Dehumidification is enabled/disabled via DehumidEnabled."
DehumLTmpSpt	35°F to 65°F		35	65	55	Cannot perform dehumidification when the control temp is lower than this setpoint.
DehumStgDn	20°F to 40°F		20	40	32	Stage down dehumidification when the aiIndoorCoilTemp ≤ this setpoint. Stage up when aiIndoorCoilTemp ≥ this setpoint + 4°F.
PassDhmFBPD	0% to 100%		1	100	50	Passive Dehum F&B Damper Max
TemperEn	DISABLE, ENABLE (DISABLE)		0	1	0	Enables Air Tempering Mode.
TemperDiff	2.0°F to 20.0°F (5.0°F)		2	20	5	DAT is compared to ncpOccHeatSetpt – this parameter when entering Enters Air Tempering Mode.
FanOnInUnocc	OFF, ON (OFF)		0	1	0	Indoor fan runs in unoccupied mode
SpcCO2En	DISABLE, ENABLE (DISABLE)		0	1	0	Space CO_2 Enable
CfgAnIn14:	NONE, CO2		0	2	1	Selects virtual function for configurable analog inputs. Options are: NONE CO2 RSTVLT
CfgAnIn10:	NONE, EWT, OCT (EWT)		0	3	1	Selects virtual function for configurable analog inputs. Options are: NONE EWT OCT ICT_SRT
CfgAnIn12:	NONE, ICT_SRT (ICT_SRT)		0	3	3	
CfgBI1	(HIGH_PRESSURE)		0	10	1	Selects virtual function for binary input. 24 VAC Input
CfgBI2	(FREEZE_STAT)		0	10	2	Selects virtual function for binary input. 24 VAC Input
CfgBI3	(NONE)		0	10	0	Selects virtual function for binary input. 24VAC Input
CfgBI4	(NONE)		0	10	0	Selects virtual function for binary input. 24VAC Input
CfgBI5	(BOILERLESS_EH)		0	10	5	Selects virtual function for binary input. Discrete Input
CfgBI6	(VENT_LOCKOUT)		0	10	6	Selects virtual function for binary input. Discrete Input
CfgBI7	(UNOCCUPIED)/(NONE)		0	10	7	Selects virtual function for binary input. Discrete Input
CfgBI8	(SHUTDOWN)		0	10	8	Selects virtual function for binary input. Discrete Input

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
CfgBO1	FAN_LOW/ECM_ENABLE		0	18	1	Selects virtual function for binary output. Options are: DISABLED, FAN_LOW, FAN_MEDIUM, FAN_HIGH, REVERSING_VALVE, FAULT_OUT, OUTDOOR_FAN, EXHAUST_FAN, PUMP, ELECTRIC_HEAT1, ELECTRIC_HEAT2, ELECTRIC_HEAT3, COMPRESSOR1, COMPRESSOR2, DRAIN_PAN_HEATER, HOT_WATER_EOC, COLD_WATER_EOC, ECM_ENABLE, AUX_HEAT
CfgBO2	FAN_MEDIUM		0	18	2	
CfgBO3	FAN_HIGH		0	18	3	
CfgBO4	REVERSING_VALVE/HOT_WATER_EOC		0	18	15	
CfgBO5	FAULT_OUT		0	18	5	
CfgBO6	OUTDOOR_FAN		0	18	0	
CfgBO7	EXHAUST_FAN/AUX_HEAT		0	18	0	
CfgBO8	PUMP		0	18	0	
CfgBO9	ELECTRIC_HEAT1		0	18	0	
CfgBO10	ELECTRIC_HEAT2		0	18	0	
CfgBO11	ELECTRIC_HEAT3		0	18	0	
CfgBO12	COMPRESSOR1/COLD_WATER_EOC		0	18	0	
CfgBO13	COMPRESSOR2		0	18	0	
CfgBO14	DRAIN_PAN_HEATER		0	18	0	
CfgHtEOC_Rev	DIRECT, REVERSED (DIRECT)		0	1	1	Selects if the hot water EOC output is reverse acting.
CfgClEOC_Rev	DIRECT, REVERSED (DIRECT)		0	1	0	Selects if the cold water EOC output is reverse acting.
CfgDrPnHt_Rev	DIRECT, REVERSED (DIRECT)		0	1	0	Selects if the drain pan heater output is reverse acting.
CfgFltOut_Rev	DIRECT, REVERSED (DIRECT)		0	1	0	Selects if the bo5 binary output is reverse acting.
AlmBOcfg	FAULT, FAULTPROB (FAULTPROB)		0	1	1	Selects if the alarm binary output is on just when a fault occurs or when a fault or problem occurs
Compressor						
CmpMnOnTm	60 sec to 600 sec (180 sec)		60	600	180	Compressor Minimum On Time
CmpMnOffTm	60 sec to 600 sec (300 sec)		60	600	360	Compressor Minimum Off Time
ClOATLckSpt	45°F to 80°F (63.5°F)		45	80	63.5	When the OAT is below this temperature and it's an ASHP then CompClgOATLockoutStatus is LOCKED.
CmpHtOATLck	10°F to 212°F (30°F)		12	212	30	If the OAT is less than this setpoint, then compressorized heating is disabled. Air source heat pumps only.
CmpHtEWTLck	10°F to 212°F (30°F)		10	212	30	If the EffEWT is less than this setpoint, then compressorized heating is disabled. Water source heat pumps only.
RevVlvTmr	0 to 30 sec (5 sec)		0	30	5	If the reversing valve has to change then it must be commanded this many seconds after the compressor starts.
RandomStrtTm	0 to 60 seconds (0 seconds)		0	60	0	Compressor Start delay. Prevents simultaneous start up of compressors.
CmpStartDly	300 sec to 360 seconds. (300 sec)		300	360	300	This parameter defines how long after powerup a compressor can start. It's defined as 300 sec + ncpRandomStart.
CmpRunTm	0.0 hrs to 300,000.0 hrs		0	300,000		This is the total compressor run time. It must have resolution of 0.1 hours and have a range of at least 300,000 hours.
MnPmpOnTime	0 to 120 sec (30 sec)		0	120	30	Minimum time that pump has to be on before WSHP compressor will energize.
DefChkTmSpt	30 to 120 min		30	120	90	Defines how often to check for defrost condition in ASHPs
ASHPDefTime	3 to 5 min		3	5	4	This is how long the defrost operation occurs. This applies only to the ASHP. The WSHP uses a fixed 60 second time.
LwSctLnSpt	20°F to 35°F		20	35	28	The low suction line temperature alarm setpoint is defaulted to 28°F. The alarm becomes INACTIVE when the temperature gets to this setpoint + cpLowSuctLineProtDiffSetpt.

Parameter (LUI)	Operating Range (Default)	ABV	Min	Max	Default	Description
LwSctLnDifSpt	(4.0°F)		1	8	4	"The low suction line temperature alarm setpoint is fixed at 28°F. The alarm becomes INACTIVE when the temperature gets to 28°F + this setpoint."
DefInFanSpt	30°F to 110°F		30	110	90	If aiIndoorCoilTemp ≥ to this setpt then the indoor fan is turned off, otherwise it can run.
OACoilTmpSpt	30°F to 40°F		30	40	32	Defrost mode ends when the defrost timer expires or when aiOutdoorCoilTemp ≥ cpOACoilTempSetpt + cpDefrostTempDiff.
DefTmpDiff	5°F to 40°F		5	40	20	Defrost mode ends when the defrost timer expires or when aiOutdoorCoilTemp ≥ cpOACoilTempSetpt + cpDefrostTempDiff.
Network Communications						
MinInst	0 to 4194302		0	4194302	3101000	Added to BACnetNodeAddress to determine the Device Instance Number (BNDevInstance).
Loc	0 ("Location")				Location	Location Label
DevInst	0 to 4194302		0	4194302	3101120	BACnet device instance.
DevName	String 20 char.				DevName	BACnet device name string.
NdAddr	0 to 127		0	127	120	BACnet MSTP node address.
MSTPBaud	9600, 19200, 38400, 76800		0	3	2	BACnet MSTP baud rate.
MSTPMaxMstr	1 to 127		1	127	127	BACnet MSTP max masters.
MSTPInfoFr	1 to 5		1	5	1	BACnet MSTP info frames.
MeasUnits	IMPERIAL, SI (IMPERIAL)		0	1	0	BACnet measurement units.
SndHrtBt	0 to 6553.4 sec (0.0 sec)		0	6553.4	0	Send Heartbeat. When set to non-zero, for each NVO, this is the maximum time before each NVO is sent-out.
RcvHrtBt	0 to 6553.4 sec (0.0 sec)		0	6553.4	0	Receive Heartbeat. If an NVI isn't received within this amount of time then the default NVI will be used.
MnTimeOut	0 to 6553.4 sec (0.0 sec)		0	6553.4	0	Minimum Send Time. This amount of time must pass before an NVO can be sent.

Alarm and Fault Monitoring

The most important aspect of troubleshooting unit ventilator controls is to isolate the source of the problem into one of two categories:

1. The problem resides within the UVC (hardware or software).
2. The problem is external to the UVC. Under most circumstances the problem is external to the UVC.

The UVC is programmed to monitor the unit for specific alarm conditions.

Alarm Types:

- **Auto:** Alarm clears automatically when the condition clears
- **2-Auto in 7 Days then Manual:** Alarm clears automatically unless the alarm has occurred 3 or more times within 7 days; in that case the alarm must be cleared manually
- **Manual:** The alarm must be cleared manually

If an alarm condition exists, the following occurs:

- The UVC indicates the fault condition by displaying the fault code on the optional keypad/display
- The remote wall-mounted sensor (optional) Status Indicator flashes a pattern indicating that a fault condition exists
- The fault signal binary output energizes for fault alarms, or fault and problem alarms (default, configurable)
- The fault performs the appropriate control actions as described for each fault

Manual reset faults can be reset in one of four ways:

- By cycling the unit power
- Via the keypad/display menu
- Via the network interface
- Via an input from a remote mounted space sensor

Table 25: Alarm and Fault Code Summary

Alarm Number	Name	Type	Priority	Label	Reset	MultComp Alarm
1	ShutdownDIAlarm	Fault	3	Shutdown Discrete Input Fault	Auto	
2	SpaceTempSensorAlarm	Problem	8	Space Temp Sensor Failure	Auto	
3	HighDxPressureAlarm	Problem	9	High DX Pressure Fault	2-Auto in 7-days then manual	X
4	DATLLDxAlarm	Problem	10	Discharge Air DX Low Limit Violation	Auto	
5	CondensateOverflowAlarm	Problem	11	Condensate Overflow Indications	Auto	
6	IndoorAirCoilDxTempSensorAlarm	Problem	12	Indoor Air Coil Dx Temp Sensor Failure	Auto	X
7	OATSensorAlarm	Fault	4	Outdoor Air Temp Sensor Failure	Auto	
8	DATSensorAlarm	Fault	5	Discharge Air Temp Sensor Failure	Auto	
9	OutdoorAirCoilDxTempSensorAlarm	Problem	13	Outdoor Air Coil DX Temp Sensor Failure	Auto	X
10	WaterCoilDxTempSensorAlarm	Problem	14	Water Coil DX Temp Sensor Failure	Auto	X
11	WaterOutTempSensorAlarm	Problem	15	Water-out Temp Sensor Failure	Auto	
12	WaterInTempSensorAlarm	Problem	16	Water-in Temp Sensor Failure	Auto	
13	SpaceHumiditySensorAlarm	Problem	17	Space Humidity Sensor Failure	Auto	
14	OutdoorHumiditySensorAlarm	Problem	18	Outdoor Humidity Sensor Failure	Auto	
15	SpaceCO_2SensorAlarm	Problem	19	Space CO_2 Sensor Failure	Auto	
16	WaterInTempInadequateAlarm	Problem	20	Source Temp (Water-in) Inadequate Indication	Auto	
17	WaterCoilFreezeFaultAlarm	Fault	21	Hydronic Water Coil Freeze Fault	Auto	
18	LowSuctionLineTempAlarm	Problem	22	Low Suction Line Temp Failure	2-Auto in 7-days then manual	
19	CantCoolAlarm	Problem	23	Can't Cool	Auto	
20	CantHeatAlarm	Problem	24	Can't Heat	Auto	
21	DATLLAlarm	Problem	25	DAT Low Limit	Auto	
22	BrownoutAlarm	Problem	26	Brownout Problem	Auto	X
23	HighVoltageAlarm	Problem	27	High Voltage Problem	Auto	X
24	ChangeFilterAlarm	Warning	32	Change Filter Indication	Manual	
25	LowOACoilTempAlarm	Problem	28	Low Outside Air Coil Temp	Auto	
26	ReturnTempSensorAlarm	Problem	29	Return Temp Sensor Failure	Auto	
27	FactoryConfigStrigAlarm	Fault	6	Factory Configuration String Problem	Manual	
28	ControlTempAlarm	Fault	7	Control Temp Not Available	Manual	X
29	ConfigurationAlarm	Warning	30	Configuration Issue	Auto	
30	ControlBoardAlarm	Fault	2	Control Board Hardware Failure	Auto	

Sensor Faults and Failures

Fault Sequences

Emergency Stop/Shutdown Discrete Input

Name: ShutdownDIAlarm

Description: A configured binary input is telling the unit to stop/shutdown.

Type: Fault

Activate: Unit is configured to have a shutdown input installed and the associated binary input is closed.

Upon active:

- Alarm type is Fault which causes unit shutdown
- State: Off Alarm
- Alarm is indicated on the LUI
- Fault relay is NOT energized
- LED output alarm indication is activated
- Space fan is immediately de-energized
- Compressor is immediately de-energized
- Outdoor fan is immediately de-energized
- Outside air damper is forced closed
- All electric heat stages are de-energized
- Face and bypass damper is positioned to bypass
- Heat/cool valves are fully closed to the coil

Deactivate: Shutdown binary input is opened.

Reset: Auto

Note: This does not power the unit off, but does halt operation.

Space Temp Sensor Failure

Name: SpaceTempSensorAlarm

Description: Space Temp Sensor Failure (short or open detected)

Type: Problem

Activate: Appropriate input is configured for a space temperature sensor and the sensor reading is out of range for 30 seconds.

Upon active:

- Control temp will be based on return temp if available. If return temp is not available then ControlTempAlarm becomes active
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Sensor reading goes back in range

Reset: Auto

High DX Pressure Fault

Name: HighDxPressureAlarm

Description: High refrigerant pressure fault.

Type: Problem

Activate: Unit is configured to have a high pressure switch installed and the associated binary input is open.

Upon active:

- State:
  - If in cooling state then transition to a non-DX cooling state, if available, otherwise transition to Prepare to Cool
  - If in heating then transition to a non-DX heating state, if available, otherwise transition to Prepare to Heat
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- Compressor is immediately de-energized
- Outdoor fan is de-energized
- Use Electric heat if possible

Deactivate: High pressure binary input closes

Reset: 2-Auto in 7-days then niResetAlarm or LuiResetAlarm must become CLEAR_ALARM

Discharge Air Temperature Low Limit DX

Name: DATLLDxAlarm

Description: Discharge air temperature has gone lower than the discharge air Mechanical Cooling Low Limit setpoint during compressorized cooling.

Type: Problem

Activate: Discharge Air Temperature <= Mechanical Cooling Low Limit and the unit is in compressor cooling.

Upon active: (describes what happens in other modules)

- State: Prepare to Cool
- Alarm is indicated on the LUI
- Fan speed is increased (1 stage for fixed speed fan, 30% for variable speed fan)
- Fault relay is energized if cpAlarmBOut is FAULTPROB
- LED output fault indication is activated

Deactivate: Discharge Air Temperature > Mechanical Cooling Low Limit + 1.8F

Reset: Auto reset

Condensate Overflow Indication

Name: CondensateOverflowAlarm

Description: Condensate overflow indication (drain pan full of condensate).

Type: Problem

Activate: The unit is configured for condensate overflow detection and the sensor indicates high levels of condensate in the drain pan.

Upon active:

- State: If in cooling state then transition to economizer cooling state, if available, otherwise transition to Fan Only
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- CompCoolAvail is set to UNAVAIL.
- Outdoor fan is de-energized normally then remains de-energized
- Chilled water valve is forced closed
- Cooling EOC valve is forced closed
- Heat / Cool EOC is closed if water-in temperature indicates cooling

Deactivate: Activate is not Active.

Reset: Auto

Indoor Air Coil Refrigerant Temperature Sensor Failure

Name: IndoorAirCoilDxTempSensorAlarm

Description: Indoor air coil DX temp sensor failure (short or open).

Type: Problem

Activate: Appropriate input is configured for an indoor air coil refrigerant temperature sensor and the sensor reading is out of range.

Upon active:

- State:
  - If in cooling state then transition to a non-DX cooling state, if available, otherwise transition to Fan Only
  - If in heating then transition to a non-DX heating state, if available, otherwise transition to Fan Only
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- Compressor is immediately de-energized (MultAlarmComp = ACTIVE)
- Outdoor fan is de-energized normally then remains de-energized

Deactivate: Sensor reading goes back in range.

Reset: Auto

Outdoor Air Temperature Sensor Failure

Name: OATSensorAlarm

Description: Outdoor air temp sensor failure (short or open detected)

Type: Fault

Activate: Appropriate input is configured for an outdoor air temperature sensor and the sensor reading is out of range.

Upon active:

- Alarm type is Fault which causes unit shutdown
- Fault relay is energized.
- LED output alarm indication is activated

Deactivate: Sensor reading goes back in range.

Reset: Auto

Discharge Air Temperature Sensor Failure

Name: DATSensorAlarm

Description: Discharge air temperature sensor failure (short or open detected).

Type: Fault

Activate: Discharge Air Temperature reading is out of range.

Upon active:

- State: Prepare to Cool
- Alarm is indicated on the LUI
- Fan speed is increased (1 stage for fixed speed fan, 30% for variable speed fan)
- Fault relay is energized if cpAlarmBOut is FAULTPROB
- LED output fault indication is activated

Deactivate: Sensor reading goes back in range.

Reset: Auto

Outdoor Air Coil Refrigerant Temperature Sensor Failure

Name: OutdoorAirCoilDxTempSensorAlarm

Description: Outdoor air coil refrigerant temperature sensor failure (short or open detected).

Type: Problem

Activate: Unit is not configured as a split system, an appropriate input is configured for an outdoor air coil refrigerant temperature sensor and the sensor reading is out of range.

Upon active:

- State:
  - If in cooling state then transition to a non-DX cooling state, if available, otherwise transition to Fan Only.
  - If in heating then transition to a non-DX heating state, if available, otherwise transition to Fan Only.
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB.
- LED output alarm indication is activated
- Compressor is immediately de-energized
- Outdoor fan is de-energized

Deactivate: Sensor reading goes back in range.

Reset: Auto

Water Coil Refrigerant Temperature Sensor Failure

Name: WaterCoilDxTempSensorAlarm

Description: Water Coil Refrigerant Temperature Sensor Failure (short or open detected).

Type: Problem

Activate: Unit is a WSHP and an appropriate input is configured for a water coil refrigerant temperature sensor and the sensor reading is out of range.

Upon active:

- State:
  - If in cooling state then transition to a non-DX cooling state, if available, otherwise transition to Fan Only
  - If in heating then transition to a non-DX heating state, if available, otherwise transition to Fan Only
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- Compressor is immediately de-energized

Deactivate: Sensor reading goes back in range.

Reset: Auto

Water-Out Temp Sensor Failure

Name: WaterOutTempSensorAlarm

Description: Leaving water temperature sensor failure (short or open).

Type: Problem

Activate: Appropriate input is configured for a leaving water temperature sensor and the sensor reading is out of range.

Upon active:

- State: If in cooling state then transition to a non-DX cooling state, if available, otherwise transition to Fan Only
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Sensor reading goes back in range.

Reset: Auto

Entering Water Temperature Sensor Failure

Name: WaterInTempSensorAlarm

Description: Entering water temperature sensor failure (short or open).

Type: Problem

Activate: Appropriate input is configured for an entering water temperature sensor and the sensor reading is out of range.

Upon active:

- If in hydronic cooling state/heating then switch to non-hydronic cooling/heating state if available, otherwise transition to Fan Only
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- Hydronic cooling/heating is disabled

Deactivate: Sensor reading goes back in range.

Reset: Auto

Space Humidity Sensor Failure

Name: SpaceHumiditySensorAlarm

Description: Space humidity sensor failure (short or open detected).

Type: Problem

Activate: Space humidity sensor control is enabled, appropriate input is configured for an space humidity sensor and the sensor reading is out of range.

Upon active:

- State: if in dehumidification then transition to Fan Only
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- Enthalpy comparison economizer cannot be used
- Dehumidification function cannot be used

Deactivate: Sensor reading goes back in range.

Reset: Auto

Outdoor Humidity Sensor Failure

Name: OutdoorHumiditySensorAlarm

Description: Outdoor humidity sensor failure (short or open detected)

Type: Problem

Activate: Outdoor humidity sensor control is enabled, appropriate input is configured for an outdoor humidity sensor and the sensor reading is out of range.

Upon active:

- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- OA enthalpy nor enthalpy comparison economizer can be used

Deactivate: Sensor reading goes back in range.

Reset: Auto

Space CO_2 Sensor Failure

Name: SpaceCO2SensorAlarm

Description: Space CO_2 sensor failure (short or open detected).

Type: Problem

Activate: Appropriate input is configured for a CO_2 sensor and the CO_2 reading is out of range.

Upon active:

- State: None
- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated
- CO_2 demand controlled ventilation is disabled if this value is used for the effective CO_2 reading (i.e. no network CO_2 input is being supplied)

Deactivate: Sensor reading goes back in range.

Reset: Auto

Entering Water Inadequate Indication

Name: WaterInTempInadequateAlarm

Description: Checks if entering water temperature is adequate for current unit mode.

Type: Problem

Activate: all of the following are true:

- Appropriate input is configured for EWT
- Cooling/Heating request has been active for longer than the delay timer
- The measured entering water temperature is <5°F below the control temperature for cooling or <5°F above the control temperature for heating

Upon active:

- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: The measured entering water temperature is more than 5°F below the control temperature for cooling or more than 5°F above the control temperature for heating.

Reset: Auto

Hydronic Water Coil Freeze Fault

Name: WaterCoilFreezeFaultAlarm

Description: Hydronic water coil freeze fault to protect coil from freezing. Note: see WaterCoilFreezeProblemAlarm for problem alarm that occurs when the unit has a face and bypass damper.

Type: Fault

Activate: Unit is configured to have a Hydronic Water Coil Freeze Stat installed, the associated binary input is open. and the face and bypass damper is disabled.

Upon active:

- Alarm type is Fault which causes unit shutdown.
- State: Off Alarm
- Alarm is indicated on the LUI
- Fault relay is energized
- LED output fault indication is activated
- Space fan is immediately de-energized
- Compressor is immediately de-energized
- Outdoor fan is immediately de-energized
- Outside air damper is forced closed
- All electric heat stages are de-energized
- The hot/cold water valves are forced to position of 50%.

Deactivate: Freeze stat input closes

Reset: Auto

Low Suction Line Temperature

Name: LowSuctionLineTempAlarm

Description: The suction line temperature is below the Low Suction Line Temperature setpoint.

Type: Problem

Activate: If the unit is configured to have an indoor air coil/ suction line refrigerant temperature sensor and the reading is reading <= Low Suction Line Temperature setpoint and the unit is not in the defrost state.

Upon active:

- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Indoor air coil/suction line refrigerant temperature >= Low Suction Line Temperature setpoint + Low Suction Line Temperature Differential.

Reset: 2 automatic resets in 7 days then a manual clear from the LUI keypad, network or room sensor is required.

Can't Cool Failure

Name: CantCoolAlarm

Description: The unit is trying to cool, but conditions do not allow this (entering water temperature is too high for hydronic cooling), or no flow to the compressor for WSHPs.

Type: Problem

Activate: All of the following are true:

- Cooling is required
- Compressor cooling is unavailable.
- Entering water temperature is too warm for hydronic heating
- Economizer cooling is unavailable

Upon active:

- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Compressor or economizer cooling becomes available, or the entering water temperature becomes cold enough to provide cooling.

Reset: Auto

Can't Heat Alarm

Name: CantHeatAlarm

Description: The unit is trying to heat, but conditions do not allow this (entering water temperature is too low to heat and no other form of heating is available), or an ASHP has a call for heating but the compressor is locked out because of low OAT, or no flow to the compressor for WSHPs.

Type: Problem

Activate: All of the following are true:

- Heating is required
- Compressor heat is unavailable
- Entering water is too cold for hydronic heating
- Unit is not configured for electric heat

Upon active:

- Alarm is indicated on the LUI
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Compressor heating becomes available or the entering water temperature becomes warm enough to provide heat.

Reset: Auto

Discharge Air Temperature Low Limit

Name: DATLLAlarm

Description: The discharge air temperature is below the Economizer Low Limit setpoint and heating capacity is at 100% for longer than the discharge air temperature low limit alarm timer. This alarm can occur from any state except compressor or hydronic cooling.

Type: Problem

Activate: Discharge air temperature < Discharge air economizer low limit setpoint AND it's not in compressor or hydronic cooling and all heat stager are on.

Upon active:

- State: Any non-cooling mode go to Low Limit State
  - OA reduced
- State: Any cooling mode go to Reheat State
  - Heating increased
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Discharge air temperature >Discharge air economizer low limit setpoint + 1.8°F and the outdoor air damper position has returned to its calculated minimum position.

Reset: Auto

Brownout (Future)

Name: BrownoutAlarm

Description: 24VAC input voltage is more than 20% below nominal.

Type: Problem

Activate: 24 VAC input voltage <= 80% nominal value.

Upon active:

- Compressor is immediately de-energized
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output fault indication is activated

Deactivate: 24 VAC input voltage > 80% nominal value.

Reset: Auto

High Voltage (Future)

Name: HighVoltageAlarm

Description: 24VAC input voltage is more than 20% above nominal.

Type: Problem

Activate: 24 VAC input voltage >= 120% nominal value.

Upon active:

- Compressor is immediately de-energized
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: 24 VAC input voltage < 120% nominal value.

Reset: Auto

Change Filter Indication

Name: ChangeFilterAlarm

Description: The indoor fan has been running for longer than the filter change hours setpoint indicating that the filter may be dirty:

Type: Warning

Activate: The software is configured to allow this alarm and the filter runtime hours >= the filter change hours setpoint.

Upon active:

- Alarm is indicated on the LUI

Deactivate: Filter reset command is sent from the network or LUI keypad.

Upon De-active:

- Set Filter Change Hours to 0

Reset: Auto.

Low Outdoor Air Refrigerant Coil Temperature

Name: LowOACoilTempAlarm

Description: The outdoor air refrigerant coil temperature value goes below minimum setpoint.

Type: Problem

Activate: Outdoor air refrigerant coil temperature <= outdoor air refrigerant coil temperature setpoint and for longer than the defrost check time.

Upon active:

- State: Defrost when it occurs.
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Outdoor air refrigerant coil temperature >= outdoor air refrigerant coil temperature setpoint + 4°F.

Reset: Auto

Return Temperature Sensor Failure

Name: ReturnTempSensorAlarm

Description: Return Temperature Sensor Failure (short or open detected).

Type: Problem

Activate: The software configuration indicates a room/ return air temperature sensor is installed and the return air temperature is reading out of range.

Upon active:

- Control temperature will be based on space temperature if available. If space temperature is not available then ControlTempAlarm becomes active
- Fault relay is energized if alarm output configuration is FAULTPROB
- LED output alarm indication is activated

Deactivate: Return/room air temperature reading is in range.

Reset: Auto

Factory Configuration String Alarm

Name: FactoryConfigStringAlarm

Description: There was a problem with the factory config string that was read in. User must verify all factory configuration parameters.

Type: Fault

Activate: FactoryConfigError is Active.

Upon active:

- Alarm type is Fault which causes unit shutdown
- Unit state goes to ‘Off Alarm
- Alarm is indicated on the LUI
- Fault relay is energized
- LED output alarm indication is activated
- Space fan is immediately de-energized
- Compressor is immediately de-energized
- Outdoor fan is immediately de-energized
- Outside air damper is forced closed
- All electric heat stages are de-energized
- Face and bypass damper is positioned to 100% face
- Heat/cool valves are fully opened to the coil

Deactivate: none

Reset: Manual

Control Temp Alarm

Name: ControlTempAlarm

Description: Neither Space Temp nor Return Temp is available.

Type: Fault

Activate: Space and return/room air temperature are out of range.

Upon active:

- Unit state goes to ‘Off Alarm’
- Alarm is indicated on the LUI
- Compressor is immediately de-energized
- Fault relay is energized
- LED output alarm indication is activated
- Space fan is immediately de-energized
- Compressor is immediately de-energized
- Outdoor fan is immediately de-energized
- Outside air damper is forced closed
- All electric heat stages are de-energized
- Face and bypass damper is positioned to 100% face
- Heating/chilled water valve is fully opened to the coil (2 pipe)
- Chilled water valve is fully closed to the coil (4 pipe)

Deactivate: Space or return/room air temperature are in range and the alarm is reset from the network, LUI, or room sensor.

Reset: Manual

Hydronic Water Coil Freeze Fault

Name: WaterCoilFreezeFaultAlarm

Description: Hydronic water coil freeze fault to protect coil from freezing.

NOTE: See WaterCoilFreezeProblemAlarm for problem alarm that occurs when the unit has a face and bypass damper.

Type: Fault

Activate: Unit is configured to have a Hydronic Water Coil Freeze Stat installed, the associated binary input is open and the face and bypass damper is disabled.

Upon active:

- Alarm type is Fault which causes unit shutdown.
- State: Off Alarm
- Alarm is indicated on the LUI
- Fault relay is energized
- LED output fault indication is activated
- Space fan is immediately de-energized
- Compressor is immediately de-energized
- Outdoor fan is immediately de-energized
- Outside air damper is forced closed
- All electric heat stages are de-energized
- The hot/cold water valves are forced to position of 50%.

Deactivate: Freeze stat input closes

Reset: Auto

Application Configuration Alarm

Name: ConfigurationAlarm

Description: There is an issue with one or more configuration parameters. This means that multiple, or duplicate, inputs have been configured for the same functionality. See Table 26 for information about the various configuration alarms.

Type: Warning

Upon active:

- Alarm is indicated on the LUI

Deactivate: Activate is not Active.

Reset: Auto

Table 26: Application Configuration Alarm

Enum/ Priority	Indication	Description
1	DUPLICATE_AI	The same analog input function has been selected for more than one configurable analog input.
2	DUPLICATE_BI	The same binary input function has been selected for more than one configurable binary input.
3	COMP_HP	Application is configured for compressor operation, but no binary input is configured for a high-pressure switch
4	FRZ_STAT	Application is configured as 2 pipe or 4 pipe (indicating a water coil) but, no binary input is configured for a freeze stat (does not apply if there's a steam valve and no chilled water coil)
5	COMP_ICT_SRT	Application is configured for compressor operation, but no analog inputs are configured for an ICT/SRT (Indoor Coil Temp / Suction Refridgerant Temp) input.
6	ECM_ENABLE	Application is configured for ECM_MODBUS fan control but no binary output is configured for ECM fan enable
7	3SPD_FAN	Application is configured for 3 fix speed fan control but there are not binary outputs configured for low, medium, and high speeds
8	ASHP_OAF	Application is configured as an ASHP or AIR_COOL, AND no binary outputs are configured for an outdoor fan AND it's not a Split System.
9	ASHP_OCT	Application is configured as an ASHP, but no analog inputs are configured for a OCT
10	COMP_OUT	Application is configured for compressor operation, but binary output Compressor1 is not defined OR compressor stage 2 is not defined and it's not a split system.
11	WC_VALVE	Application is configured as 2 pipe or 4 pipe (indicating a water coil) but the valve configuration is none
12	CHG_OVER_EWT	Application is configured for chilled water/hot water changeover (2 pipe with both heating and cooling valves) but no analog input is configured for EWT
13	CW_EOC	Application is configured for a 2 position chilled water valve but no binary output is configured for Cold Water EOC
14	HW_EOC	Application is configured for a 2 position hot water valve but no binary output is configured for Hot Water EOC
15	4PIPE_2VLV	Application is configured for a 4 pipe system but the valve configuration is for heating only or cooling only.
16	ELECT_HEAT_BO	Application is configured for electric heat, but the specified number of binary outputs is not configured.
17	NO_HEAT_OR_ COOL	Application is not configured for heating and/ or cooling. Heating must include Compressor or Hydronic or Electric, and cooling must include Compressor or Hydronic.
18	SETPT_ORDER	"Minimum heat cool delta: DeltaOcc = ncpOccDiff*2 + 1 One of the cooling setpoints is less than the minimum from ncpOccHeatSetpt, or one of the heating setpoints is less than the minimum from ncpOccCoolSetpt"
19	COMP_HTCL_ AND_HYDRO	Has compressor heating and cooling, and hydronic heating and/or cooling. Cannot have compressor heat and hydronic heating or compressor cooling and hydronic cooling.
20	SCHED_ OVERLAP	The schedules must be configured in the proper order.

Control Board Alarm

Name: ControlBoardAlarm

Description: The application has detected a functional issue with the control board.

Type: Fault

Activate: Internal application point ControlBoardStatus bit field is not 0.

Upon active:

- Alarm is indicated on the LUI
- Unit is shut down

Deactivate: Internal application point ControlBoardStatus bit field is 0.

Reset: Auto (this is not likely to reset as the cause is usually a hardware problem with the board).

Modbus Alarm

Name: ModbusAlarm

Description: An alarm related to the Client/Server network. The MbAlarmStatus parameter can be referenced to determine what is causing the alarm. MbAlarmStatus point can be one of the following: OK, CONFIG, COMM, VERSION, SRANGE, CRANGE, RSRANGE, DUP. See Table 27 for descriptions of the various alarm values.

Type: Problem

Activate: One of the MODBUS issues defined by MbAlarmStatus is Active.

Upon active:

- Fault relay is energized if alarm output configuration is FAULTPROB
- LUI Alarm LED is energized if alarm output configuration is FAULTPROB
- UV board Status LED output is energized if alarm output configuration is FAULTPROB.

Deactivate: Activate is not Active.

Reset: Auto

Table 27: Modbus Alarms

Config:	Configuration Table. Internal software error. Server-only alarm.
SRange:	Server Range. Active if unit is SERVER AND cpModbusAddress is < 2. Server-only alarm.
CRange:	Client Range. Active if unit is CLIENT AND cpModbusAddress is not 1. Client-only alarm.
RSRange:	N/A
Version:	Modbus Table Version. All UVs on the MODBUS network must have the same MODBUS table version. The MbTableVersion depends on the UVAppVersion of the UV. Server and Client alarm.
Duplicate:	Duplicate Client/Server Address. There is duplicate Client or Server on the network. All devices must have a unique Modbus address. Server and Client alarm.
Comm:	Communications. Server: Becomes active if the number of Modbus devices currently communicating is not cpNumberModbusDevices. Client: becomes active when the Client is not communicating with the server. Server and Client alarm.
OK:	There are no issues.

Server Fault Alarm

Name: ServerFaultAlarm

Description: At least one of the Modbus Server UVs have an alarm that is a Fault. The server alarm parameters [Server2Alarm, Server3Alarm, …, Server10Alarm] can be referenced to see the highest priority active alarm for each UV.

NOTE: A fault has occurred in a server. Although labeled a Server fault, this will produce a problem alarm in the Client as a Server fault will not shut down the Client unit.

Type: Problem

Activate: At least one of the following is a fault alarm [Server2Alarm, Server3Alarm, …, Server10Alarm].

Upon active:

- Fault relay is energized if alarm output configuration is FAULTPROB
- LUI Alarm LED is energized if alarm output configuration is FAULTPROB
- UV board Status LED output is energized if alarm output configuration is FAULTPROB.

Deactivate: Activate is not Active.

Reset: Auto

Server Problem Alarm

Name: ServerProblemAlarm

Description: At least one of the Modbus Server UVs have an alarm that is a Problem. The server alarm parameters [Server2Alarm, Server3Alarm, …, Server10Alarm] can be referenced to see the highest priority active alarm for each UV.

Type: Problem

Activate: At least one of the following is a problem alarm [Server2Alarm, Server3Alarm, …, Server10Alarm].

Upon active:

- Fault relay is energized if alarm output configuration is FAULTPROB
- LUI Alarm LED is energized if alarm output configuration is FAULTPROB
- UV board Status LED output is energized if alarm output configuration is FAULTPROB.

Deactivate: Activate is not Active.

Reset: Auto

Server Warning Alarm

Name: ServerWarningAlarm

Description: At least one of the Modbus Server UVs have an alarm that is a Warning. The server alarm parameters [Server2Alarm, Server3Alarm, …, Server10Alarm] can be referenced to see the highest priority active alarm for each UV.

Type: Warning

Activate: At least one of the following is a warning alarm [Server2Alarm, Server3Alarm, …, Server10Alarm].

Upon active:

- Alarm is indicated on the LUI

Deactivate: Activate is not Active.

Reset: Auto

Troubleshooting Temperature Sensors

The UVC is configured to use passive negative temperature coefficient (NTC) sensor whose resistance decreases with increasing temperature. The element has a reference resistance of 10K ohms at 77°F (25°C). Each element is calibrated as highlighted in Table 28 below.

Use the following procedure to troubleshoot a suspect sensor.

1. Disconnect both sensor leads from the UVC.
2. Using some other calibrated temperature sensing device, take a temperature reading at the sensor location.
3. Use the temperature reading from Step 2 to determine the expected sensor resistance from Table 28.
4. Using a calibrated ohmmeter, measure the actual resistance across the two sensor leads.
5. Compare the expected resistance to the actual resistance.
6. If the actual resistance value deviates substantially (more than 10%) from the expected resistance, replace the sensor.

Table 28: Temperature Versus Resistance

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	323839	11	-11.67	60592	61	16.11	14925	111	43.89	4561	161	71.67	1655
-37	-38.33	300974	13	-10.56	57017	63	17.22	14180	113	45.00	4367	163	72.78	1594
-35	-37.22	279880	15	-9.44	53647	65	18.33	13478	115	46.11	4182	165	73.89	1536
-33	-36.11	260410	17	-8.33	50526	67	19.44	12814	117	47.22	4006	167	75.00	1480
-31	-35.00	242427	19	-7.22	47606	69	20.56	12182	119	48.33	3838	169	76.11	1427
-29	-33.89	225809	21	-6.11	44874	71	21.67	11590	121	49.44	3679	171	77.22	1375
-27	-32.78	210443	23	-5.00	42317	73	22.78	11030	123	50.56	3525	173	78.33	1326
-25	-31.67	196227	25	-3.89	39921	75	23.89	10501	125	51.67	3380	175	79.44	1279
-23	-30.56	183068	27	-2.78	37676	**77**	**25.00**	**10000**	127	52.78	3242	177	80.56	1234
-21	-29.44	170775	29	-1.67	35573	79	26.11	9526	129	53.89	3111	179	81.67	1190
-19	-28.33	159488	31	-0.56	33599	81	27.22	9078	131	55.00	2985	181	82.78	1149
-17	-27.22	149024	33	0.56	31732	83	28.33	8653	133	56.11	2865	183	83.89	1109
-15	-26.11	139316	35	1.67	29996	85	29.44	8251	135	57.22	2751	185	85.00	1070
-13	-25.00	130306	37	2.78	28365	87	30.56	7866	137	58.33	2642	187	86.11	1034
-11	-23.89	121939	39	3.89	26834	89	31.67	7505	139	59.44	2538			
-9	-22.78	114165	41	5.00	25395	91	32.78	7163	141	60.56	2438			
-7	-21.67	106939	43	6.11	24042	93	33.89	6838	143	61.67	2343			
-5	-20.56	100218	45	7.22	22770	95	35.00	6530	145	62.78	2252			
-3	-19.44	93909	47	8.33	21573	97	36.11	6238	147	63.89	2165			
-1	-18.33	88090	49	9.44	20446	99	37.22	5960	149	65.00	2082			
1	-17.22	82670	51	10.56	19376	101	38.33	5697	151	66.11	2003			
3	-16.11	77620	53	11.67	18378	103	39.44	5447	153	67.22	1927			
5	-15.00	72911	55	12.78	17437	105	40.56	5207	155	68.33	1855			
7	-13.89	68518	57	13.89	16550	107	41.67	4981	157	69.44	1785			
9	-12.78	64419	59	15.00	15714	109	42.78	4766	159	70.56	1718			

Troubleshooting Humidity Sensors

⚠ CAUTION

The humidity sensor is not protected against reversed polarity. Check carefully when connecting the device or damage can result.

The UVC is configured to use a 0–100% RH, 0–5 VDC, capacitive humidity sensor. Each sensor is calibrated according to the table shown.

Use the following procedure to troubleshoot a suspect sensor:

1. Disconnect the sensors output voltage lead from the UVC analog input.
2. Using some other calibrated humidity sensing device, take a humidity reading at the sensor location.
3. Use the humidity reading from Step 2 determine the expected sensor voltage from Table 29.
4. Using a calibrated multi-meter, measure the actual voltage across the yellow and white sensor leads.
5. Compare the expected voltage to the actual voltage.
6. If the actual voltage value deviates substantially (more than 10%) from the expected voltage, replace the sensor.

Wire color definitions:

- White = ground
- Yellow = output VDC
- Blue = supply VDC

Table 29: Humidity Versus Voltage

RH (%)	VDC (mV)	RH (%)	VDC (mV)
10	1330	55	2480
15	1475	60	2600
20	1610	65	2730
25	1740	70	2860
30	1870	75	2980
35	1995	80	3115
40	2120	85	3250
45	2235	90	3390
50	2360	95	3530

Troubleshooting Carbon Dioxide (CO_2) Sensors

The UVC is configured to use a 0–2000 PPM, 0–10 VDC, single beam absorption infrared gas sensor. Each sensor is calibrated according to the table shown.

Use the following procedure to troubleshoot a suspect sensor.

1. Disconnect the sensors output voltage lead from the UVC analog input (AI-14).
2. Using some other calibrated CO_2 sensing device, take a CO_2 reading at the sensor location.
3. Use the CO_2 reading from Step 2 to determine the expected sensor voltage from Table 30.
4. Using a calibrated multi-meter, measure the actual voltage across the lead removed from AI-14 and ground.
5. Compare the expected voltage to the actual voltage.
6. If the actual voltage value deviates substantially (more than 10%) from the expected voltage, replace the sensor

In the unlikely event that the CO_2 sensor requires calibration, consult the factory for information on obtaining calibration equipment and instructions.

Table 30: CO_2 Versus Voltage

CO_2 (PPM)	VDC (V)	CO_2 (PPM)	VDC (V)
300	1.5	1200	6.0
400	2.0	1300	6.5
500	2.5	1400	7.0
600	3.0	1500	7.5
700	3.5	1600	8.0
800	4.0	1700	8.5
900	4.5	1800	9.0
1000	5.0	1900	9.5

Table 31: Local User Interface (LUI) Parameters

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Live			
Live:	N	RO	not displayed
EnterPW:	N	N	Enter a new password.
PWLevel:	N	RO	Current password level.
MSM:	N	RO	Main state machine (MSM) state.
CntrlTmp:	N	RO	Value of selected control temp.
EffSpt:	N	RO	Effective setpoint.
EffectOcc:	N	RO	Actual occupancy mode of unit.
ClearPW:	N	U	Clear the password level to NONE.
Alarms			
Alarms-Active	N	RO	
Alarms-History	N	RO	
Alarms-Server	N	RO	
Unit Status			
MSM:	F	RO	Main state machine (MSM) state index.
MSM:	N	RO	Main state machine (MSM) state.
Prv1MSM:	T	RO	Previous1 main statemachine state.
Prv2MSM:	T	RO	Previous2 main statemachine state.
Prv3MSM:	T	RO	Previous3 main statemachine state.
Prv4MSM:	T	RO	Previous4 main statemachine state.
SysStatCmd:	N	RO	System status command result.
KeySysCmd:	N	M	Keypad heat/cool Command.
CltSyStCmd:	N	RO	Client system statuscommand.
EffHtCl:	N	RO	Effective heat/cool mode of unit.
EnergHold:	N	RO	Energy hold-off status.
ClEnrgHld:	N	RO	Client energy hold-off.
NetEnrgHld:	N	RO	Energy hold-off network command.
KeyEnrgHld:	N	M	Energy hold-off keypad command.
EmergOvRes:	N	RO	Emergency override result.
ClEmergOv:	N	RO	Client Emergency override.
NetEmergOv:	N	T	Network emergency override.
KeyEmergOv:	N	M	Keypad emergency override.
ClStgChg:	F	RO	Cool staging cmd: none, up, down.
HtStgChg:	F	RO	Heat staging cmd: none, up, down.
AllowHeat:	T	RO	Heating allowed status.
AllowCool:	T	RO	Cooling allowed status.
AllwDehum:	T	RO	Dehumidification allowed status.
NgtPrgTmr:	N	RO	Night purge count down timer.
EffHtClNn:	N	RO	Mode is: Heat, Cool or None.
AuxHt:	N	RO	Aux heat on/off status.
KeyOnStopButton:	F	N	Keypad On/Stop button.
OnStop:	N	RO	Keypad On/Stop status.
LowOAFrzSt:	T	RO	Active when OAT < EOCLowOASpt.
VlvFrzProt:	T	RO	Actv if LowOAFrzStatactv and F&B closed.
CondOverflw:	T	RO	Condensate overflow status.
Occupancy			
EffectOcc:	N	RO	Actual occupancy mode of unit.
KyOccManCmd:	N	U	Keypad occupancy override command.
NtOccManCmd:	N	T	Network occupancy override command.
NetOccSens:	N	RO	Network occupancy sensor.
NtOccSched:	N	RO	Network occupancy schedule command.
ClientOcc:	N	RO	Client occupancy mode of unit.
TenantOver:	N	RO	Tenant Override start trigger.
IntSched:	N	RO	Internal schedule status.
Temperatures			
SpaceTmp:	N	RO	Current space temperature.
RAT:	N	RO	Return Air Temperature.
CntrlTmp:	N	RO	Value of selected control temp.
CltCtrlTmp:	N	RO	Client control temperature.
EffOAT:	N	RO	Effective outside air temperature.
DAT:	N	RO	Discharge air temperature.
EffEWT:	N	RO	Entering Water Temperature.
LWT:	N	RO	Leaving Water Temperature.
InAirCoilDx:	N	RO	Indoor air/DX coil temperature.
OutArCoilDx:	N	RO	Outdoor air/DX coil temperature.
CntrlTmpSt:	N	RO	Cool, heat, between or invalid.
NtSpcTmp:	N	T	Network space temp.
NtOAT:	N	T	Network outside air temp.
NetEWT:	N	T	Network entering water temperature.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Setpoints			
EffSpt:	N	RO	Effective setpoint.
NetSetpt:	N	T	Network setpoint.
Setpoint:	N	RO	Temperature setpoint
ClgSpt:	N	RO	Current cooling setpoint.
HtgSpt:	N	RO	Current heating setpoint.
CltClgSpt:	N	RO	Client cooling setpoint.
CltHtgSpt:	N	RO	Client heating setpoint.
SetptMeth:	N	RO	Setpoint calculationmethod used.
SetptOffset:	N	RO	Network/Keypad setpoint offset.
LocSptShft:	N	RO	Local hardwired setpoint shift.
ClgSptOff:	N	RO	Current calculated cooling off setpt.
HtgSptOff:	N	RO	Current calculated heating off setpt.
NtSptOffst:	N	T	Network setpoint offset.
NtOccClSptSh:	N	T	Lon Occupied cooling setpoint shift.
NtStdClSptSh:	N	T	Lon Standby cooling setpoint shift.
NtOccHtSptSh:	N	T	Lon Occupied heating setpoint shift.
NtStdHtSptSh:	N	T	Lon Standby heating setpoint shift.
DTA:	F	RO	Degree Time Above used by stage ctrl.
DTB:	F	RO	Degree Time Below used by stage ctrl.
Indoor Fan			
CurFanSpd:	N	RO	Current indoor fan speed.
FanState:	N	RO	Indoor fan running state.
KeyInFan:	N	U	Keypad manual indoor fan override.
NetFanSpdCmd:	N	T	Network Fan spd cmd Negative for Auto.
CltFanSpd:	N	RO	Client indoor fan speed.
FanCntMeth:	N	RO	Method controlling indoor fan.
CalcFanSpd:	T	RO	Calculated indoor fan speed.
SZVavFanPI:	T	RO	Single zone VAV fan speed PI out.
Compressor			
NetCmpEn:	N	RO	Network compressor enable.
ClOATLckStat:	N	RO	Status of OAT comp clg lock-out.
CmpHtOATLkSt:	N	RO	ASHP: Status of OAT comp htg lock-out.
CmpHtEWTLkSt:	N	RO	WSHP: Status of EWT comp htg lock-out.
CompOnTmr:	N	RO	Seconds since comp was turned on.
CompOffTmr:	N	RO	Seconds since comp was turned off.
PumpCmd:	N	RO	Pump command.
CmpClAvl:	N	RO	Specifies comp cooling is avail.
CmpHtAvl:	N	RO	Specifies comp heating is avail.
CmpStgCmd:	T	RO	Commanded compressor stages.
RevVlvCmd:	T	RO	Commanded reversing valve.
RevVlvStat:	N	RO	Reversing valve status.
DfrstSt:	N	RO	Current defrost state.
LLCmpStgCmd:	T	RO	MinDAT,MinDATLwLimit commanded comp stgs.
MSMRevVlvCmd:	T	RO	MSM commanded reversing valve.
MSMCmpStgCmd:	T	RO	MSM commanded comp stages.
MSMPumpCmd:	T	RO	MSM Pump command.
EmHtCmpStgCmd:	T	RO	Emergency heat commanded comp stages.
HydroHeating			
HotWtr:	N	RO	Hot water valve position.
HydroHtAvl:	N	RO	Specifies hydronic heat is available.
HydroHtCmd:	T	RO	MainStateMachine cmded hydro heating.
EwtHtState:	M	RO	EWT hydronic heating state.
EwtFlwHtTmr:	T	RO	Timer for EWT flow heat state machine.
HWVlvMxTout:	T	RO	Hot water valve maxed for 3 minutes.
HydroCooling			
ColdWtr:	N	RO	Cold water valve position.
HydroClAvl:	N	RO	Specifies hydronic cooling is avail.
HydroClCmd:	T	RO	MainStateMachine cmded hydro cooling.
EwtClState:	M	RO	EWT hydronic cooling state.
EwtFlwClTmr:	T	RO	Timer for EWT flow cool state machine.
OADamper			
OADPos:	N	RO	Outside air damper position.
OADMinPos:	N	RO	Current OAD minimum position calc.
EffSpcCO2:	N	RO	Effective CO2 level in the space.
OADMode:	N	RO	Outdoor air damper mode.
OADLowTmpSt:	M	RO	OA damper low temperature status.
OADCO2Pos:	T	RO	OAD position for CO2 control.
OADAutoPos:	T	RO	Min of OADMinPos and free clg calc.
OADIndrFan:	T	RO	Current OAD indoor fan calculation.
FreeClAvl:	M	RO	Specifies free cooling is avail.
FreeClCmd:	F	RO	MainStateMachine cmded free cooling.
FreeClStrg:	T	RO	Free cooling strategy being used.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
FreeClEn:	M	RO	Free cooling enabled calculation.
OADPosReset:	T	RO	Outside Air Damper Reset calc.
OADPosFreCl:	T	RO	Free Cooling Pi Loop calculation
ClEfSpcCO2:	N	RO	Client effective CO2level in the space.
NtOADMinPos:	N	T	Min OAD position override.
NetEconEn:	N	RO	Network economizer enable.
NtSpcCO2:	N	T	Network CO2 level in the space.
FaceBypassDamper			
FBDamper:	N	RO	Face & bypass damper position.
FB_PIOut:	T	RO	Face & bypass PI loop output.
FBOpen100%:	N	RO	FBDamper open 100% for FBStrkTm.
DAT			
DATSpt:	N	RO	Current DAT setpoint.
DATClgSpt:	N	RO	DAT Cooling setpoint.
DATHtgSpt:	N	RO	DAT Heating setpoint.
AllHtStgsOn:	T	RO	Active if all heat stages are on.
AllHtStgsOf:	T	RO	Active if all heat stages are off.
AirTmprgMod:	M	RO	Tempering if DAT < HtgSpt and not unocc
DAHiLimMode:	M	RO	Actv if DAT > DA HiLimMode and ht on.
CmpAirTmprg:	M	RO	Status of comp heat air tempering.
DATRstClIn:	M	RO	Value used in DAT Clg reset control.
DATRstHtIn:	M	RO	Value used in DAT Htg reset control.
DATDehumSpt:	M	RO	DAT Dehumidification setpoint.
MnDATCntlIn:	M	RO	Min DAT control input.
MnDATSpt:	M	RO	Min DAT calculated setpoint.
NtMnDATSpt:	N	T	Network min DAT setpoint.
NtDATClgSpt:	N	T	Network DAT cooling setpoint.
NtDATHtgSpt:	N	T	Network DAT heating setpoint.
CltDATClSp:	N	RO	Client DAT cooling setpoint.
CltDATHtSp:	N	RO	Client DAT heating setpoint.
ElectricHeating			
ElHtStgOut:	N	RO	Number of elect ht stages currently on.
ElectHtAvl:	N	RO	Specifies electric heat is available.
ElHtCmdStgs:	N	RO	Commanded electric heat stages.
ElDatLLPIOt:	T	RO	Elect heat DAT LL PI loop output.
ElDatLLPIOutStg:	T	RO	Convert ElDatLL PI Out to stages.
ElDehmPIOut:	T	RO	Elect ht dehumid PI loop output.
ElDehumPIOutStg:	T	RO	Convert ElectDehum PI Out to stages.
Dehumid			
EffOutRH:	N	RO	Effective outside relative humidity.
EffSpaceRH:	N	RO	Effective space relative humidity.
OutEnth:	N	RO	OA enthalpy using OAT and OA humidity.
InEnth:	N	RO	IA enth using space temp and IA humid.
EffHum:	N	RO	Current humidity status of space.
DehumAvl:	N	RO	Specifies if dehumid is avail.
DehumEn:	N	RO	Keypad or network dehumid enabled.
DehmCtrlCmd:	N	RO	MSM commanded dehumidification.
NetOutRH:	N	T	Network outdoor relative humidity.
NetSpcRH:	N	T	Network space relative humidity.
SpaceDewpt:	N	RO	Calculated space dewpoint.
NetSpcDewpt:	N	T	Network supplied space dewpoint.
EffSpcDewpt:	N	RO	Effective space dewpoint.
AllAvlDehHt:	N	RO	All avail dehumid heat is on.
Timers			
InStgTmr:	N	RO	Seconds since state change occurred.
PmpOnTmr:	N	RO	Seconds since pump was turned on.
RoomSensor			
RSSysMode:	N	RO	Room sensor mode status.
RSFanSpd:	N	RO	Room sensor fan speed status.
Set			
Set-Unit			
Set-SensorInstall			
Set-Setpoints			
Set-IndoorFan			
Set-Compressor			
Set-Timers			
Set-Dehumid			
Set-DAT			
Set-ElectricHeat			
Set-OutdoorDamper			
Set-FaceBypassDampr			
Set-HydroHeating			
Set-HydroCooling			

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Set-ExhaustFan			
Set-Defrost			
Set-Alarms			
Set-BACnet			
Set-LonWorks			
Set-Schedule			
Set-Clock			
Set-DaylightSaving			
Set-AuxHeat			
Set-MODBUS			
Service			
Serv-OpHours			
Serv-SaveRestore			
Serv-AnaIn			
Serv-BinIn			
Serv-AnaOut			
Serv-BinOut			
Serv-PWM			
Serv-TrendData			
BMSComm			
Location:	N	M	Location of unit.
NetInAlarm:	N	RO	LonWorks unit status InAlarm.
NetMode:	N	RO	LonWorks unit status Mode.
NetHtPri:	N	RO	LonWorks unit status Heat Out Primary.
NetHtSec:	N	RO	LonWorks unit status Heat Out Secondary.
NetCool:	N	RO	LonWorks unit status Cool Out.
NetEcon:	N	RO	LonWorks unit status Economizer.
NetFan:	N	RO	LonWorks unit status Fan Out.
NetAppMode:	N	T	Current network application mode.
ServPin:	N	M	Send Lon Srvc Pin orBACnet I AM msg.
Password			
PWLevel:	N	RO	Current password level.
KeyOnStopPW:	N	N	Current keypad On/Stop password level.
ClearPW:	N	U	Clear the password level to NONE.
PWTimer:	N	RO	Password countdown timer.
Alarms|Active			
ActiveAlarm:	N	RO	Active alarm.
AlmStat:	N	RO	Active alarm status.
AlCfg:	N	RO	Cause of Configurable Alarm.
MbAlmStat:	N	RO	Modbus alarm status
MultAlmComp:	T	RO	Active when a comp alarm is active.
CntrlBoardStat:	T	RO	Control bd hardware alarm status
TORstAlm:	N	RO	Tenant override reset alarms.
TechSupport:	N	RO	Display tech support screen.
Alarms-History			
HistoryAlarms:	N	RO	Alarm history.
TechSupport:	N	RO	Display tech support screen.
Set-Unit			
InFanSel:	N	T	Indoor fan select.
CompType:	N	T	Compressor type.
SpltSysSel:	N	T	Split or non-split system.
ValveType:	N	T	Valve type.
WtrPipes:	N	T	Select 2 pipe or 4 pipe.
SteamValve:	N	T	Steam valv installed instead of hot water
FBDmprEn:	N	T	Face and bypass damper enable.
ElHtStgs:	N	T	Specifies number of elect heat stages.
EnthSel:	N	T	Select outdoor enth calc strategy.
BypassTime:	N	U	Local bypass time.
EmergHtEn:	N	T	Emergency Heat Enable.
EmergHtSpt:	N	T	Emergency Heat Setpoint.
MnPmpOnTime:	N	T	Min pump on time before comp turn on.
EmHtShtDnEn:	N	T	Emergency shutdown heat enable.
BMSType:	N	T	Building Management System Type.
Set-SensorInstall			
SpcTmpSens:	T	T	Space temp sensor.
CondOFlwSn:	N	T	Condenser overflow sensor.
OATSens:	T	T	Outside air temp sensor.
LWTSens:	T	T	Leaving water temp sensor.
InHumSens:	T	T	Indoor humidity sensor.
OutHumSens:	T	T	Outdoor humidity sensor.
RATSens:	T	T	Return air temp sensor.
SptAdjSens:	T	T	Setpoint Adjust sensor installed.
RSSysModSn:	T	T	Room Sensors System Mode installed.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
RSFanSpdSn:	T	T	Room Sensors Fan Speed installed.
HiPrsBISen:	T	RO	High pressure BI sensor.
InCoilTSen:	T	RO	Indoor coil temp sensor.
OutCoilTSn:	T	RO	Outdoor coil temp sensor.
EWTSens:	T	RO	Entering water temp sensor.
CO2Sens:	T	RO	CO2 sensor installed.
FrzStatCfg:	T	RO	Freeze stat BI configured.
ExhILkBiCf:	T	RO	Exhaust Interlock BI input configured.
DmpEnd1Cfg:	T	RO	Damper End 1 BI input configured.
DmpEnd2Cfg:	T	RO	Damper End 2 BI input configured.
BLessEHCfg:	T	RO	Boilerless Elect Ht BI input configured.
VLckOutCfg:	T	RO	Vent Lockout BI input configured.
UnOccCfgd:	T	RO	Unoccupied BI input configured.
ShutDnCfgd:	T	RO	Shutdown BI input configured.
DehumCfgd:	T	RO	Dehumid BI input configured.
RstVltSens:	T	RO	Reset volts sensor.
Set-Setpoints			
KeySptOffset:	N	U	Keypad setpoint offset adj.
OccClSpt:	N	U	Occupied cooling setpoint.
OccHtSpt:	N	U	Occupied heating setpoint.
UnoccClSpt:	N	U	Unoccupied cooling setpoint.
UnoccHtSpt:	N	U	Unoccupied heating setpoint.
StdbyClSpt:	N	U	Bypass cooling setpoint.
StdbyHtSpt:	N	U	Bypass heating setpoint.
OccDiff:	N	M	Occ, bypass & standby setpt diff.
UnoccDiff:	N	M	Unocc setpt diff.
SptMethCfg:	N	T	Setpoint calculation method config.
CntrlTmpSel:	N	T	Space, RAT or hardware input avg.
KeySptOfstSel:	N	U	Keypad setpoint offset select.
RemSptAdjType:	N	T	Remote sensor setpoint adj type.
Set-IndoorFan			
FanChgsPerHr:	N	M	Allowed fan changes per hour.
FanOffDel:	N	T	Indoor fan off delay
FanCycling:	N	T	Continuous or cycling in occ mode.
FanOnInUnocc:	N	T	Indoor fan runs in unoccupied mode.
BrkptAutoLow:	N	T	Speed transition for low fan.
BrkptAutoMed:	N	T	Speed transition for medium fan.
BrkptAutoHi:	N	T	Speed transition for high fan.
BrkptAutoDiff:	N	M	Speed transition differential.
FanRstSel:	N	T	Indoor fan reset control.
PWMLowFan:	N	T	PWM_3Fixed low fan speed.
PWMMedFan:	N	T	PWM_3Fixed medium fan speed.
PWMHiFan:	N	T	PWM_3Fixed high fan speed.
RstMnFan:	N	M	Min fan when controlled by reset.
RstMxFan:	N	M	Max fan when controlled by reset.
FnCO2PropGn:	F	F	Indoor fan CO2 proportional gain.
FnCO2IntgGn:	F	F	Indoor fan CO2 integral gain.
Set-Compressor			
CmpRVTm:	N	T	Compressor reversingvalve delay.
CmpMnOnTm:	N	T	Compressor minimum on time.
CmpMnOffTm:	N	T	Compressor minimum off time.
ClOATLckSpt:	N	T	Comp clg disabled when OAT < setpt.
CmpHtOATLck:	N	T	ASHP: Comp htg disabled when OAT < spt.
CmpHtEWTLck:	N	T	WSHP: Comp htg disabled when EWT < spt.
RevVlvTmr:	N	M	Rev vlv chgs this long after comp strt
RandomStrtTm:	M	RO	Delay after powerup before comp turn on.
CmpStartDly:	M	T	Random start time delay (Nonvolatile).
Set-Timers			
EWFlwTmSpt:	N	M	Flow time before hydro ht/cl avail.
MinStgTmSpt:	N	M	Min stage time.
ClStgTmSpt:	N	M	Min time before clg stg chg can occur.
HtStgTmSpt:	N	M	Min time before htg stg chg can occur.
NgtPrgTm:	N	T	Night purge state time.
About			
TableVer:	N	RO	Keypad table build version.
UVModel:	F	RO	Unit Vent model.
Language:	F	RO	Selected language.
Units:	N	U	Selected units used in keypad.
DispTimeout:	N	M	Keypad display time-out. 0 for alway on.
KeyAppVer:	N	E	Keypad application version V.RR.BB.
UVAppVer:	N	RO	UV software version V.RR.BB
UnitSfN:	N	RO	Unit Software Number NNNNNNNVVR
LonSfN:	N	RO	Lon Software Number NNNNNNNVVR

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
MbTblVer:	N	F	Modbus table version of this UV.
MbClntTblVer:	N	RO	Modbus table version of client.
BootVer:	N	RO	Bootloader version.
StartTmr:	N	RO	Time since powerup.
Set-Dehumid			
SpcRHSpt:	N	M	Space RH setpoint. Can come from mb.
SpcRHSptOfDf:	N	M	Space relative humidity setpoint diff.
KeyDehumEn:	N	M	Keypad dehumid enable.
DehumType:	N	T	Active adds reheat.
DehumStgDn:	T	T	Stg dn dehum when in coil temp < spt.
PassDhmFBPD:	T	T	F&B damper max for passive dehum.
NetDehumEn:	N	T	Network dehumid enable.
DehumFanSpt:	N	M	Initial dehumid fan speed.
DehumLTmpSpt:	N	M	No dehum when cntrl temp < this spt.
DehumSptSel:	N	T	Dehumid measurement type.
SpcDewptSpt:	N	M	Dehumid dewpoint setpt.
SpcDwptOffDf:	N	T	Dehumid dewpoint offset differential.
Set-DAT			
DATClSpt:	N	M	DAT cooling setpt when NONE selected.
DATHtSpt:	N	M	DAT heating setpt when NONE selected.
DAEconLL:	N	T	DAT econ low limit setpt.
DAMechLL:	N	T	Discharge air mech low limit setpt.
RehtLLStTime:	T	T	MinDAT to MinDATLowLimit time.
DAHiLim:	N	T	Discharge air high limit.
DATRstClSel:	N	T	Source of DAT Clg reset control.
MnDATClSpt:	T	T	Min input to DAT clg reset calc.
MxDATClSpt:	T	T	Max input to DAT clg reset calc.
MnDATClRSpt:	T	T	Min DAT clg reset setpoint.
MxDATClRSpt:	T	T	Max DAT clg reset setpoint.
MnDATClDfSpt:	T	T	Min inpt to DAT diff clg reset calc.
MxDATClDfSpt:	T	T	Max inpt to DAT diff clg reset calc.
DATRstHtSel:	N	T	Source of DAT Htg reset control.
MnDATHtSpt:	T	T	Min input to DAT htg reset calc.
MxDATHtSpt:	T	T	Max input to DAT htg reset calc.
MnDATHtRSpt:	T	T	Min DAT htg reset setpoint.
MxDATHtRSpt:	T	T	Max DAT htg reset setpoint.
MnDATHtDfSpt:	T	T	Min inpt to DAT diff htg reset calc.
MxDATHtDfSpt:	T	T	Max inpt to DAT diff htg reset calc.
DATClDb:	N	T	DAT cooling deadband.
DATHtDb:	N	T	DAT heating deadband.
MnDATRstSel:	N	T	DAT reset min DAT select.
cfMinDATSpt:	M	M	MnDATSpt when NONE selected.
MnDATMnSpt:	T	T	Min DAT reset calc min setpt.
MnDATMxSpt:	T	T	Min DAT reset calc max setpt.
MnDATMnCnSpt:	T	T	Min DAT reset calc min control setpt.
MnDATMxCnSpt:	T	T	Min DAT reset calc max control setpt.
Set-ElectricHeat			
ElHtPropGn:	N	T	Electric heating proportional gain.
ElHtIntgGn:	N	T	Electric heating integral gain.
ElHtStgTmSpt:	N	T	Min time elect heat stg chg can occur.
MnElHtFanOnTm:	N	T	Min fan on after leaving elect heat.
ElHtSupSel:	N	T	Allow elect heat to supplement primary.
Set-OutdoorDamper			
OADMnPos:	N	M	Min OAD for CO2 and fan at high speed.
OADMnPsMdSp:	N	M	Min OAD when space fan at medium speed.
OADMnPsLwSp:	N	M	Min OAD when space fan at low speed.
SpcCO2Lim:	N	M	Space CO2 setpoint.
EcnOADifSpt:	N	M	Economizer outdoor air diff setpoint.
EconDBDiff:	N	M	Economizer IA/OA temperature diff.
EcEnthSpt:	N	M	Economizer enthalpy setpoint.
EcEnthDif:	N	M	Economizer enthalpy setpoint diff.
OAMxPos:	N	T	Maximum Outdoor Air damper position.
OALockEn:	N	M	OA damper low temperature lockout.
OALockSpt:	N	M	OA damper low temp lockout setpoint.
OATSpt:	N	M	Economizer OAT setpoint.
KeyEconEn:	N	U	Keypad economizer enable.
EconPropGn:	N	M	Economizer proportional gain.
EconIntgGn:	N	M	Economizer integral gain.
CO2PropGn:	T	T	CO2 proportional gain.
CO2IntgGn:	T	T	CO2 integral gain.
TemperDiff:	N	T	Air tempering mode differential.
TemperEn:	N	T	Air tempering mode enable.
OAMnExIlck:	N	M	Min OAD when exh interlock active.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
EOCLowOASpt:	N	M	EOC valve open if OAT<spt and FBPD clsd.
OADRstEn:	N	T	OAD analog input reset enable.
RstMnVlts:	T	T	RstVlts at this then reset minimum.
RstMxVlts:	T	T	RstVlts at this then reset maximum.
RstMnVltOAD:	T	T	OADPosReset when RstVlts at RstMnVlts
RstMxVltOAD:	T	T	OADPosReset when RstVlts at RstMxVlts.
SZnVAVMxDelta:	T	T	Single zone VAV max delta.
SZnVAVMnFan:	T	T	PI loop: Single zone VAV min fan.
SZnVAVMxFan:	T	T	PI loop: Single zone VAV max fan.
SZnVAVPropGn:	T	T	Single zone VAV proportional gain.
SZnVAVIntgGn:	T	T	Single zone VAV integral gain.
OADLLPropGn:	T	T	OAD lower limit proportional gain.
OADLLIntgGn:	T	T	OAD lower limit integral gain.
OADLLInitPos:	T	T	Initial lower limit OAD position.
OADLLPiOut:	T	T	Lower limit OAD PI calculation.
SpaceCO2En:	N	T	Enable control of space CO2.
Set-FaceBypassDampr			
FBDPropGn:	N	T	Face & bypass damper proportional gain.
FBDIntgGn:	N	T	Face & bypass damper integral gain.
FBStrkTm:	T	T	Time for FBP damper to swing open.
EWTFbAlrDly:	N	M	Alarm delay if EWT not suitable.
FBPMinPos:	T	T	Face bypass min pos with 2 pos valve.
Set-HydroHeating			
SrcTmpDiff:	N	T	Min water temp diff for hydro ht & cl.
HtWtrPI:	N	RO	Hot water PI loop output.
HtPropGn:	T	T	Hydro htg valve proportional gain.
HtIntgGn:	T	T	Hydro htg valve integral gain.
HtgMnPos:	T	T	Output when temp delta is zero.
HtMxDeltTmp:	T	T	Cntl and trgt delta for valve at 100%.
HtMxPos:	T	T	Output when delta is max delta temp.
CfEwtRtryTm:	T	T	Delay before retrying opening vlv.
Set-HydroCooling			
ColdWtrPI:	N	RO	Cold water PI loop output.
ClPropGn:	T	T	Hydro clg valve proportional gain.
ClIntgGn:	T	T	Hydro clg valve integral gain.
ClMnPos:	T	T	Output when temp delta is zero.
ClMxDeltaTmp:	T	T	Cntl and trgt delta for valve at 100%.
ClMxPos:	T	T	Output when delta is max delta temp.
Set-ExhaustFan			
ExhStrtPos:	N	T	Energize Exh fan OAD position setpt.
Set-Defrost			
DefChkTmSpt:	N	T	How often to chk for defrst condition
DefChkTm:	N	RO	Time since last defrost cond check.
ASHPDefTmeSpt:	N	T	ASHP defrost time setpoint.
DefTmr:	N	RO	Defrost timer countdown.
LwSctLnSpt:	N	T	Low suction line temp alarm setpt.
LwSctLnDifSpt:	T	T	Low suct line temp alarm diff setpt.
DefInFanSpt:	T	T	Indoor fan off when indoor coil > spt.
OACoilTmpSpt:	N	T	Def ends OutCoilTmp > spt + DefTmpDiff.
DefTmpDiff:	T	T	Def ends OutCoilTmp > OACoilTempSpt +diff
Set-Alarms			
KeyRstAls:	N	U	Keypad reset alarms.
NetRstAls:	T	RO	Network reset alarms.
KeyRstFiltAl:	N	U	Keypad reset filter alarm.
FltChgHrsSp:	N	U	Filter change alarm hours.
FltChgHrsEn:	N	U	Filter change alarm enable.
FltChgHrs:	N	U	Current filter change hours.
DATLLAlTmSpt:	N	M	All htg on this long before DATLL Alr.
HiVltSpt:	F	F	A/D counts for high voltage alarm.
BrownOutSpt:	F	F	A/D counts for brownout voltage alarm.
ManAlTst:	F	F	Manually test an alarm.
OvrdAlarm:	F	F	Override and alarm for testing.
CfgAlmBOut:	T	T	Alarm binary out when Flt/Prob or Flt.
NetRstFiltAl:	N	RO	Network reset filter alarm.
ClrAlmHist:	T	T	Clear the alarm history table.
Serv-OpHours			
FanRunTm:	N	RO	Fan run time.
CmpRunTm:	N	RO	Compressor run time.
RstFanTm:	T	T	Resets the total fan run time.
RstCmpTm:	T	T	Resets the total compressor run time.
ServiceMode:	T	T	Service Mode.
ServiceTime:	T	T	Service Mode Timer.
RestartCt:	T	T	Number of controller restarts.
LastRstTyp:	T	T	Last controller reset type.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Serv-SaveRestore			
SaveCfgSel:	T	T	Save configuration parameters.
GetCfgSel:	T	T	Get configuration parameters.
RdWrStatus:	N	RO	Read write configs result.
SaveUserRes:	N	RO	Save user configs to SD result.
SaveParams:	N	U	Manually save to nonvolatile memory.
CfFileNumb:	T	T	SD file name: DaikinUnitVentXXX.
SDStatus:	N	RO	SD card is ready if status is Good.
AppDflts:	T	T	Set all config params to app dflts.
SystemRESET:	T	T	Reset the UV board.
FactCfgStrg:	F	F	Factory configuration string
FactCfgCmd:	F	F	Perform factory config commands.
FactCfgErr:	N	RO	Error in factory config string.
Serv-AnaIn			
Serv-AnaIn-Status			
Serv-AnaIn-Config			
Serv-AnaIn-Virtual			
Serv-AnaIn-Offset			
Serv-AnaIn-Status			
aiDAT:	N	RO	Analog input discharge air temp.
aiRAT:	N	RO	Analog input return air temp.
aiOAT:	N	RO	Analog input outside air temp.
AnaIn10:	N	RO	Analog input 10 temperature.
aiLWT:	N	RO	Analog input leaving water temp.
AnaIn12:	N	RO	Analog input 12 temperature.
CondOFlw:	N	RO	Condenser overflow value.
AnaIn14:	N	RO	Analog input 14 in counts.
OutAirFlw:	T	RO	Outside air flow value.
HdPress:	T	RO	Head pressure.
SptAdj:	N	RO	Setpoint adjust temperature.
RSSysMode:	N	RO	Remote sensor system mode value.
RSFanSpd:	N	RO	Remote sensor fan speed mode value
SpcTmpTO:	N	RO	Space temp.
HumIn:	N	RO	Indoor humidity.
HumOut:	N	RO	Outdoor humidity.
LnVlt:	N	RO	Line voltage counts.
SpcTmp:	N	RO	Space temp without tenant override.
Serv-AnaIn-Config			
CfgAnIn10:	T	T	Select virtual temp for ai10.
CfgAnIn12:	T	T	Select virtual temp for ai12.
CfgAnIn14:	T	T	Select virtual ppm/v for ai14.
Serv-AnaIn-Virtual			
CO2:	N	RO	CO2 virtual input.
RstVlts:	N	RO	Reset volts virtual input.
EWT:	N	RO	Entering water virtual temp.
OutCoilTmp:	N	RO	Outdoor coil virtual temp.
InCoilTmp:	N	RO	Indoor coil virtual temp.
Serv-BinIn			
Serv-BinIn-Status			
Serv-BinIn-Config			
Serv-BinIn-Virtual			
Serv-BinIn-Status			
BI1:	T	RO	Binary input 1 status.
BI2:	T	RO	Binary input 2 status.
BI3:	T	RO	Binary input 3 status.
BI4:	T	RO	Binary input 4 status.
BI5:	T	RO	Binary input 5 status.
BI6:	T	RO	Binary input 6 status.
BI7:	T	RO	Binary input 7 status.
BI8:	T	RO	Binary input 8 status.
Serv-BinIn-Config			
CfgBI1:	T	T	Binary input 1 virtual func select.
CfgBI2:	T	T	Binary input 2 virtual func select.
CfgBI3:	T	T	Binary input 3 virtual func select.
CfgBI4:	T	T	Binary input 4 virtual func select.
CfgBI5:	T	T	Binary input 5 virtual func select.
CfgBI6:	T	T	Binary input 6 virtual func select.
CfgBI7:	T	T	Binary input 7 virtual func select.
CfgBI8:	T	T	Binary input 8 virtual func select.
CfgDmpEndRev:	T	T	Damper end input reverse acting.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Serv-BinIn-Virtual			
HiPress:	N	RO	High pressure status.
FrzStat:	N	RO	Freeze stat status.
DmprEnd1:	N	RO	Damper end 1 status.
DmprEnd2:	N	RO	Damper end 2 status.
BLessEH:	N	RO	Boilerless electric heat status.
VentLckout:	N	RO	Ventilation lockout status.
Unocc:	N	RO	Unoccupied status.
Shutdown:	N	RO	Shutdown status.
Dehum:	N	RO	Dehumidification status.
ExhIlock:	N	RO	Exhaust interlock status.
Serv-AnaOut-MinMax			
OADMnVlts:	T	T	OADamper minimum volts.
OADMxVlts:	T	T	OADamper maximum volts.
FBDMnVlts:	M	T	Face bypass damper minimum volts.
FBDMxVlts:	M	T	Face bypass damper maximum volts.
ClVlvClsVlts:	T	T	Cooling valve close volts.
ClVlvOpnVlts:	T	T	Cooling valve open volts.
HtCOVlvClsVlts:	T	T	Heating and Chg Overvalve close volts.
HtCOVlvOpnVlts:	T	T	Heating and Chg Overvalve open volts.
Serv-AnaOut			
Serv-AnaOut-MinMax			
Serv-AnaOut-Status			
Serv-AnaOut-Offset			
Serv-AnaOut-Overide			
Serv-AnaOut-Status			
OADmpr:	T	RO	Outdoor air damper position.
FBP:	T	RO	Face and bypass damper position.
ClVlv:	T	RO	Cooling valve position.
HtCOVlv:	T	RO	Heating and Chg Overvalve position.
Serv-AnaOut-Offset			
OfOADmpr:	T	T	Outdoor air damper calibration offset.
OfFaceByp:	T	T	Face and Bypass calibration offset.
OfClVlv:	T	T	Cooling valve calibration offset.
OfHtCOVlv:	T	T	Heating and Chg Overcalibration offset.
Serv-AnaOut-Overide			
OrOADmpr:	T	T	Outdoor air damper override.
OrFBP:	T	T	Face and bypass damper override.
OrClVlv:	T	T	Cooling valve override.
OrHtCOVlv:	T	T	Heating and Chg Overoverride.
Serv-BinOut			
Serv-BinOut-Status			
Serv-BinOut-Config			
Serv-BinOut-Virtual			
Serv-BinOut-Overide			
Serv-BinOut-Status			
StatLEDMd:	T	RO	Current status LED blink pattern.
BO_LED:	N	RO	Binary output LED status.
BO1:	N	RO	Binary output 1 status.
BO2:	N	RO	Binary output 2 status.
BO3:	N	RO	Binary output 3 status.
BO4:	N	RO	Binary output 4 status.
BO5:	N	RO	Binary output 5 status.
BO6:	N	RO	Binary output 6 status.
BO7:	N	RO	Binary output 7 status.
BO8:	N	RO	Binary output 8 status.
BO9:	N	RO	Binary output 9 status.
BO10:	N	RO	Binary output 10 status.
BO11:	N	RO	Binary output 11 status.
BO12:	N	RO	Binary output 12 status.
BO13:	N	RO	Binary output 13 status.
BO14:	N	RO	Binary output 14 status.
Serv-BinOut-Config			
CfgBO1:	T	T	Binary output 1 virtual func select.
CfgBO2:	T	T	Binary output 2 virtual func select.
CfgBO3:	T	T	Binary output 3 virtual func select.
CfgBO4:	T	T	Binary output 4 virtual func select.
CfgBO5:	T	T	Binary output 5 virtual func select.
CfgBO6:	T	T	Binary output 6 virtual func select.
CfgBO7:	T	T	Binary output 7 virtual func select.
CfgBO8:	T	T	Binary output 8 virtual func select.
CfgBO9:	T	T	Binary output 9 virtual func select.
CfgBO10:	T	T	Binary output 10 virtual func select.
CfgBO11:	T	T	Binary output 11 virtual func select.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
CfgBO12:	T	T	Binary output 12 virtual func select.
CfgBO13:	T	T	Binary output 13 virtual func select.
CfgBO14:	T	T	Binary output 14 virtual func select.
CfgRvVlv_Rev:	T	T	Reversing valve output rev acting.
CfgHtEOC_Rev:	T	T	Hot water EOC output rev acting.
CfgClEOC_Rev:	T	T	Cold water EOC output rev acting.
CfgDrPnHt_Rev:	T	T	Drain pan heater output rev acting.
CfgFltOut_Rev:	T	T	Fault output reverse acting.
Serv-BinOut-Virtual			
FanLow:	N	RO	Fan low status.
FanMed:	N	RO	Fan medium status.
FanHigh:	N	RO	Fan high status.
RevVlv:	N	RO	Reversing valve status.
FltOut:	N	RO	Fault alarm status.
OutFan:	N	RO	Outside fan status.
ExhFan:	N	RO	Exhaust fan status.
Pump:	N	RO	Pump status.
ElHt1:	N	RO	Electric heat 1 status.
ElHt2:	N	RO	Electric heat 2 status.
ElHt3:	N	RO	Electric heat 3 status.
CmpStg1:	N	RO	Compressor stage 1 status.
CmpStg2:	N	RO	Compressor stage 2 status.
DrnPanHtr:	N	RO	Drain pan heater status.
HotWtrEOC:	N	RO	Hot water end of cycle valve status.
ColdWtrEOC:	N	RO	Cold water end of cycle valve status.
ECMEn:	N	RO	ECM enable status.
Serv-BinOut-Overide			
ShutdownOR:	F	F	Shutdown Override. Auto, OR_Off, OR_On
OrLED:	T	T	Binary output LED override.
OrFanLow:	T	T	Low fan output override.
OrFanMed:	T	T	Medium fan output override.
OrFanHi:	T	T	High fan output override.
OrRevVlv:	T	T	Reversing valve output override.
OrFaultOut:	T	T	Fault output override.
OrOutFan:	T	T	Outside fan output override.
OrExhFan:	T	T	Exhaust output override.
OrPump:	T	T	Pump output override.
OrElectHt1:	T	T	Electric heat 1 output override.
OrElectHt2:	T	T	Electric heat 2 output override.
OrElectHt3:	T	T	Electric heat 3 output override.
OrComp1:	T	T	Compressor 1 output override.
OrComp2:	T	T	Compressor 2 output override.
OrDrnPanHt:	T	T	Drain pan heater output override.
OrHtWtrEOC:	T	T	Hot water EOC vlv output override.
OrClWtrEOC:	T	T	Cold water EOC vlv output override.
OrEcmEn:	T	T	ECM enable output override.
OrAuxHt:	T	T	Aux heat output override.
Serv-PWM			
Serv-PWM-Status			
Serv-PWM-Override			
Serv-PWM-Status			
PwmECMSuppFan:	N	RO	ECM supply fan output.
PwmECMCondFan:	F	RO	ECM condenser fan output.
MBSuppFan:	F	RO	MODBUS supply fan output.
Serv-PWM-Override			
OrECMSuppFan:	T	T	ECM supply fan override.
OrECMCondFan:	T	T	ECM condenser fan override.
Set-BACnet			
DN:	N	M	MSTP device name.
MinInst:	T	T	System Min Inst is NdAddr + DevInst.
DevInst:	N	M	MSTP device instance.
NdAddr:	N	M	MSTP node address.
MSTPBaud:	N	M	MSTP baud rate.
MSTPMaxMstr:	N	M	MSTP max masters on network.
MSTPInfoFr:	N	M	MSTP max info frames.
MeasUnits:	N	M	BACnet measurement units.
Set-LonWorks			
SPID:	N	RO	Lon Std Program ID.
NID:	N	RO	LonWorks Neuron ID.
SndHrtBt:	M	M	LonWorks send heartbeat.
RcvHrtBt:	M	M	LonWorks receive heartbeat.
MnTimeOut:	M	M	LonWorks minimum send.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Set-Schedule			
Set-Sched-Days			
Set-Sched-Holidays			
Set-Clock			
SetYear:	N	U	Set the current year.
SetMonth:	N	U	Set the current month.
SetDate:	N	U	Set the current date.
SetHour:	N	U	Set the current hour.
SetMinute:	N	U	Set the current Minute.
SetSecond:	N	U	Set the current Second.
DayOfWeek:	N	RO	Current day of week.
Set-DaylightSaving			
DSTEnable:	N	U	Daylight savings time enable.
BeginMonth:	N	U	Daylight savings time begin month.
BeginWeek:	N	U	Daylight savings time begin week.
EndMonth:	N	U	Daylight savings time end month.
EndWeek:	N	U	Daylight savings time end week.
Set-Sched-Days			
Set-Sched-Days-Sun			
Set-Sched-Days-Mon			
Set-Sched-Days-Tue			
Set-Sched-Days-Wed			
Set-Sched-Days-Thr			
Set-Sched-Days-Fri			
Set-Sched-Days-Sat			
Set-Sched-Holidays			
Set-Sched-Hol-Hours			
Set-Sched-Hol-Hol1			
Set-Sched-Hol-Hol2			
Set-Sched-Hol-Hol3			
Set-Sched-Hol-Hol4			
Set-Sched-Hol-Hol5			
Set-Sched-Hol-Hol6			
Set-Sched-Hol-Hol7			
Set-Sched-Hol-Hol8			
Set-Sched-Hol-Hol9			
Set-Sched-Hol-Hol10			
Set-Sched-Hol-Hol11			
Set-Sched-Hol-Hol12			
Set-Sched-Hol-Hol13			
Set-Sched-Hol-Hol14			
Set-Sched-Hol-Hol15			
Set-Sched-Hol-Hol16			
Set-Sched-Days-Sun			
MonOccHr1:	N	U	Monday occupied 1 hour.
MonOccMin1:	N	U	Monday occupied 1 minute.
MonUnoccHr1:	N	U	Monday unoccupied 1 hour.
MonUnoccMin1:	N	U	Monday unoccupied 1 minute.
MonOccHr2:	N	U	Monday occupied 2 hour.
MonOccMin2:	N	U	Monday occupied 2 minute.
MonUnoccHr2:	N	U	Monday unoccupied 2 hour.
MonUnoccMin2:	N	U	Monday unoccupied 2 minute.
Set-Sched-Days-Mon			
MonOccHr1:	N	U	Monday occupied 1 hour.
MonOccMin1:	N	U	Monday occupied 1 minute.
MonUnoccHr1:	N	U	Monday unoccupied 1 hour.
MonUnoccMin1:	N	U	Monday unoccupied 1 minute.
MonOccHr2:	N	U	Monday occupied 2 hour.
MonOccMin2:	N	U	Monday occupied 2 minute.
MonUnoccHr2:	N	U	Monday unoccupied 2 hour.
MonUnoccMin2:	N	U	Monday unoccupied 2 minute.
Set-Sched-Days-Tue			
TueOccHr1:	N	U	Tuesday occupied 1 hour.
TueOccMin1:	N	U	Tuesday occupied 1 minute.
TueUnoccHr1:	N	U	Tuesday unoccupied 1 hour.
TueUnoccMin1:	N	U	Tuesday unoccupied 1 minute.
TueOccHr2:	N	U	Tuesday occupied 2 hour.
TueOccMin2:	N	U	Tuesday occupied 2 minute.
TueUnoccHr2:	N	U	Tuesday unoccupied 2 hour.
TueUnoccMin2:	N	U	Tuesday unoccupied 2 minute.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Set-Sched-Days-Wed			
WedOccHr1:	N	U	Wednesday occupied 1 hour.
WedOccMin1:	N	U	Wednesday occupied 1 minute.
WedUnoccHr1:	N	U	Wednesday unoccupied 1 hour.
WedUnoccMin1:	N	U	Wednesday unoccupied 1 minute.
WedOccHr2:	N	U	Wednesday occupied 2 hour.
WedOccMin2:	N	U	Wednesday occupied 2 minute.
WedUnoccHr2:	N	U	Wednesday unoccupied 2 hour.
WedUnoccMin2:	N	U	Wednesday unoccupied 2 minute.
Set-Sched-Days-Thr			
ThrOccHr1:	N	U	Thursday occupied 1 hour.
ThrOccMin1:	N	U	Thursday occupied 1 minute.
ThrUnoccHr1:	N	U	Thursday unoccupied 1 hour.
ThrUnoccMin1:	N	U	Thursday unoccupied 1 minute.
ThrOccHr2:	N	U	Thursday occupied 2 hour.
ThrOccMin2:	N	U	Thursday occupied 2 minute.
ThrUnoccHr2:	N	U	Thursday unoccupied 2 hour.
ThrUnoccMin2:	N	U	Thursday unoccupied 2 minute.
Set-Sched-Days-Fri			
FriOccHr1:	N	U	Friday occupied 1 hour.
FriOccMin1:	N	U	Friday occupied 1 minute.
FriUnoccHr1:	N	U	Friday unoccupied 1 hour.
FriUnoccMin1:	N	U	Friday unoccupied 1 minute.
FriOccHr2:	N	U	Friday occupied 2 hour.
FriOccMin2:	N	U	Friday occupied 2 minute.
FriUnoccHr2:	N	U	Friday unoccupied 2 hour.
FriUnoccMin2:	N	U	Friday unoccupied 2 minute.
Set-Sched-Days-Sat			
SatOccHr1:	N	U	Saturday occupied 1 hour.
SatOccMin1:	N	U	Saturday occupied 1 minute.
SatUnoccHr1:	N	U	Saturday unoccupied 1 hour.
SatUnoccMin1:	N	U	Saturday unoccupied 1 minute.
SatOccHr2:	N	U	Saturday occupied 2 hour.
SatOccMin2:	N	U	Saturday occupied 2 minute.
SatUnoccHr2:	N	U	Saturday unoccupied 2 hour.
SatUnoccMin2:	N	U	Saturday unoccupied 2 minute.
Serv-TrendData			
TrendRate:	N	T	When to record trend data to SD.
SDStatus:	N	RO	SD card is ready if status is Good.
Set-Sched-Hol-Hours			
HolOccHr1:	N	U	Holiday occupied 1 hour.
HolOccMin1:	N	U	Holiday occupied 1 minute.
HolUnoccHr1:	N	U	Holiday unoccupied 1 hour.
HolUnoccMin1:	N	U	Holiday unoccupied 1 minute.
HolOccHr2:	N	U	Holiday occupied 2 hour.
HolOccMin2:	N	U	Holiday occupied 2 minute.
HolUnoccHr2:	N	U	Holiday unoccupied 2 hour.
HolUnoccMin2:	N	U	Holiday unoccupied 2 minute.
Set-Sched-Hol-Hol1			
HolStartMM1:	N	U	Holiday 1 Month.
HolStartDD1:	N	U	Holiday 1 Date.
HolDur1:	N	U	How many days to run holiday 1 sched.
HolEnable1:	N	U	Holiday 1 enable.
Set-Sched-Hol-Hol2			
HolStartMM2:	N	U	Holiday 2 Month.
HolStartDD2:	N	U	Holiday 2 Date.
HolDur2:	N	U	How many days to run holiday 2 sched.
HolEnable2:	N	U	Holiday 2 enable.
Set-Sched-Hol-Hol3			
HolStartMM3:	N	U	Holiday 3 Month.
HolStartDD3:	N	U	Holiday 3 Date.
HolDur3:	N	U	How many days to run holiday 3 sched.
HolEnable3:	N	U	Holiday 3 enable.
Set-Sched-Hol-Hol4			
HolStartMM4:	N	U	Holiday 4 Month.
HolStartDD4:	N	U	Holiday 4 Date.
HolDur4:	N	U	How many days to run holiday 4 sched.
HolEnable4:	N	U	Holiday 4 enable.
Set-Sched-Hol-Hol5			
HolStartMM5:	N	U	Holiday 5 Month.
HolStartDD5:	N	U	Holiday 5 Date.
HolDur5:	N	U	How many days to run holiday 5 sched.
HolEnable5:	N	U	Holiday 5 enable.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Set-Sched-Hol-Hol6			
HolStartMM6:	N	U	Holiday 6 Month.
HolStartDD6:	N	U	Holiday 6 Date.
HolDur6:	N	U	How many days to run holiday 6 sched.
HolEnable6:	N	U	Holiday 6 enable.
Set-Sched-Hol-Hol7			
HolStartMM7:	N	U	Holiday 7 Month.
HolStartDD7:	N	U	Holiday 7 Date.
HolDur7:	N	U	How many days to run holiday 7 sched.
HolEnable7:	N	U	Holiday 7 enable.
Set-Sched-Hol-Hol8			
HolStartMM8:	N	U	Holiday 8 Month.
HolStartDD8:	N	U	Holiday 8 Date.
HolDur8:	N	U	How many days to run holiday 8 sched.
HolEnable8:	N	U	Holiday 8 enable.
Set-Sched-Hol-Hol9			
HolStartMM9:	N	U	Holiday 9 Month.
HolStartDD9:	N	U	Holiday 9 Date.
HolDur9:	N	U	How many days to run holiday 9 sched.
HolEnable9:	N	U	Holiday 9 enable.
Set-Sched-Hol-Hol10			
HolStartMM10:	N	U	Holiday 10 Month.
HolStartDD10:	N	U	Holiday 10 Date.
HolDur10:	N	U	How many days to run holiday 10 sched.
HolEnable10:	N	U	Holiday 10 enable.
Set-Sched-Hol-Hol11			
HolStartMM11:	N	U	Holiday 11 Month.
HolStartDD11:	N	U	Holiday 11 Date.
HolDur11:	N	U	How many days to run holiday 11 sched.
HolEnable11:	N	U	Holiday 11 enable.
Set-Sched-Hol-Hol12			
HolStartMM12:	N	U	Holiday 12 Month.
HolStartDD12:	N	U	Holiday 12 Date.
HolDur12:	N	U	How many days to run holiday 12 sched.
HolEnable12:	N	U	Holiday 12 enable.
Set-Sched-Hol-Hol13			
HolStartMM13:	N	U	Holiday 13 Month.
HolStartDD13:	N	U	Holiday 13 Date.
HolDur13:	N	U	How many days to run holiday 13 sched.
HolEnable13:	N	U	Holiday 13 enable.
Set-Sched-Hol-Hol14			
HolStartMM14:	N	U	Holiday 14 Month.
HolStartDD14:	N	U	Holiday 14 Date.
HolDur14:	N	U	How many days to run holiday 14 sched.
HolEnable14:	N	U	Holiday 14 enable.
Set-Sched-Hol-Hol15			
HolStartMM15:	N	U	Holiday 15 Month.
HolStartDD15:	N	U	Holiday 15 Date.
HolDur15:	N	U	How many days to run holiday 15 sched.
HolEnable15:	N	U	Holiday 15 enable.
Set-Sched-Hol-Hol16			
HolStartMM16:	N	U	Holiday 16 Month.
HolStartDD16:	N	U	Holiday 16 Date.
HolDur16:	N	U	How many days to run holiday 16 sched
HolEnable16:	N	U	Holiday 16 enable.

Menu Name (Menu Index)	Minimum Password to Read (None, User, Manager, Technician)	Minimum Password to Write (None, User, Manager, Technician) RO if Read Only	Help Text
Serv-AnaIn-Offset			
OfDAT:	T	T	Offset discharge air temperature.
OfRAT:	T	T	Offset return air temperature.
OfOAT:	T	T	Offset outside air temperature.
OfOCT:	T	T	Offset outdoor coil temperature.
OfLWT:	T	T	Offset leaving water temperature.
OfICT_SRT:	T	T	Offset indoor coil temperature.
OfCondOFlw:	T	T	Offset condenser overflow value.
OfCO2:	T	T	Offset CO2 value.
OfOutAirFlw:	T	T	Offset outside air flow value.
OfHdPress:	T	T	Offset head pressure.
OfSptAdj:	T	T	Offset setpoint adjust temp.
OfRSSysMode:	T	T	Offset remote snsr. system mode value.
OfRSFanSpd:	T	T	Offset remote snsr. fan spd mode value.
OfSpcTmp:	T	T	Offset space temp.
OfHumIn:	T	T	Offset indoor humidity.
OfHumOut:	T	T	Offset outdoor humidity.
OfLnVlt:	T	T	Offset line voltage.
OfEWT:	T	T	Offset entering water temp.
OfRstVlt:	T	T	Offset reset volts.
Set-AuxHeat			
AuxHtOnDiff:	N	U	Aux heat on [HtgSetpt-OnDiff].
AuxHtOffDiff:	N	U	Aux heat off [HtgSetpt-OnDiff+OffDiff].
NtAuxHeatEn:	N	RO	Aux heat network enable.
CfAuxHtRev:	T	T	Aux heat output reverse acting.
Set-MODBUS			
MbBitStr:	N	RO	Modbus adr bitfield,Server 2nd from rgt.
SrvClntTyp:	N	T	Server Client Configuration.
MbAddr:	N	T	Modbus address of this UV.
Discover:	N	T	Perform Modbus device discovery.
MbNumDevs:	N	RO	Number of non-serverdevices, else alarm.
MbAdrBF	N	RO	Modbus address bitfield.
Alarms-Server			
Srv2Al:	N	RO	Server 2 highest priority alarm.
Srv3Al:	N	RO	Server 3 highest priority alarm.
Srv4Al:	N	RO	Server 4 highest priority alarm.
Srv5Al:	N	RO	Server 5 highest priority alarm.
Srv6Al:	N	RO	Server 6 highest priority alarm.
Srv7Al:	N	RO	Server 7 highest priority alarm.
Srv8Al:	N	RO	Server 8 highest priority alarm.
Srv9Al:	N	RO	Server 9 highest priority alarm.
Srv10Al:	N	RO	Server 10 highest priority alarm.

Daikin Applied Training and Development

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