

CONTROLS MANUAL

FOR VALENT VPR SERIES AND INNOVENT AIR HANDLING UNITS



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IMPORTANT INFORMATION

SAFETY INFORMATION

**WARNING**

Live high voltage, arc flash, and electric shock can cause serious injury or death.

Control components are installed where high voltages are present. Whenever accessing control components, disconnect all electric power supplies, verify with a voltmeter that electric power is off, and wear protective equipment per NFPA 70e when working within an electric control enclosure. Failure to comply can cause serious injury or death.

**CAUTION**

Risk of damage to electrical circuitry

This device has low voltage inputs and outputs. Improper connections can result in damage to electronic components in the controller. Improper changes to the factory-programmed input/output configuration can result in incorrect signals at the controller terminals and faulty operation.

FOLLOW AND SAVE THESE INSTRUCTIONS

- Follow all warnings, cautions, installation, operating, and safety instructions on the air handler(s) and in this manual.
- Read this manual thoroughly before attempting to perform service or troubleshooting.
- Installation, startup, and service must be performed by a qualified and properly-equipped installer, service agency, and/or gas supplier.
- Follow all local building, electrical, occupational safety, and gas codes.
- Lock out all power supplies before servicing the unit to prevent accidental startup.

SENDING CONTROLLER SETTINGS FILE TO VALENT AND INNOVENT

- At first startup or commissioning, we recommend creating a backup file that includes all setpoints and offsets for each controller. See the [Software backup and restore](#) section in this manual for instructions.
- Name each file with the unit sales order-line number found on the silver nameplate attached to the electrical access door.
- We recommend emailing these files to Valent or Innovent Technical Support:
Valent: support@doas.com
Innovent : support@innoventair.com

OVERVIEW

FUNCTION

The Valent or Innovent controller is responsible for unit operation. It monitors inputs and regulates outputs to maintain unit operation. The controller provides user feedback via a handheld keypad/display, a virtual keypad/display on the web interface, or a building management system interface.

CONTROLLER

The Valent or Innovent controller receives 24 Vac power from a transformer on the main control panel and is energized when the main disconnect is on.

The size of the Carel c.pCO board varies with unit configuration.

Figure 1: The Valent or Innovent controller uses a Carel c.pCO board that has been programmed for use with your Innovent or Valent air handling unit.



USER INTERFACES

HANDHELD KEYPAD/DISPLAY

The Valent or Innovent controller is hardwired to a keypad/display that is typically handheld, but can also be panel-mounted or wall-mounted. See the [Setup](#) section for connection information and the [Navigation](#) section for operating information.

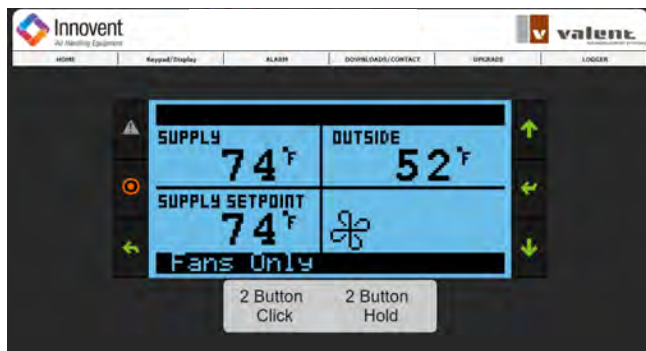
Figure 2: The handheld keypad/display is hardwired to the controller, has a six button keypad, and a backlit LCD display.



WEB INTERFACE AND VIRTUAL KEYPAD/DISPLAY

The web interface allows access to data and settings from a web browser. See the [Setup](#) section for connection information, and the [Navigation](#) and [Web interface](#) sections for operating information.

Figure 3: The web interface's virtual keypad/display functions similarly to the handheld keypad/display.



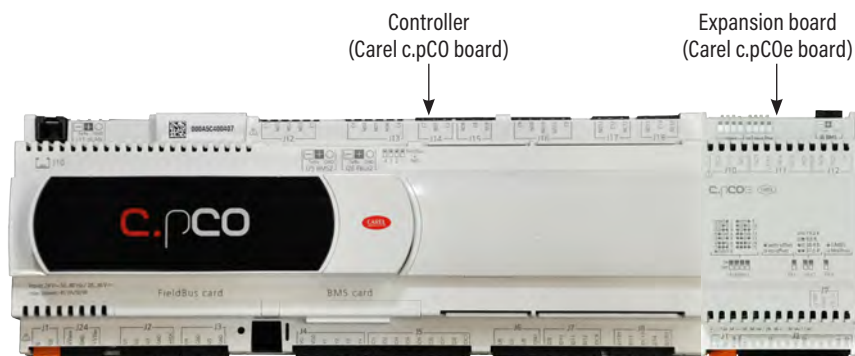
EXPANSION BOARDS

Some unit configurations require control expansion boards. Carel c.pCO and c.pCOe boards are used as expansion boards.

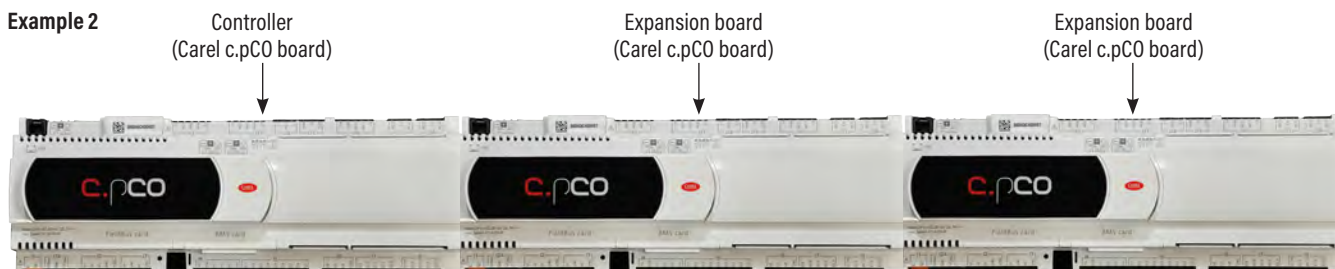
Expansion boards communicate with the controller via Modbus. See the [Setup](#) section for more information about connecting expansion boards.

Figure 4: Examples of expansion board configurations

Example 1



Example 2



EXPANSION VALVE DRIVERS

Some unit configurations have Carel EVD evolution electronic expansion valve drivers to control electronic expansion valves.

Expansion valve drivers communicate with the controller via Modbus. See the [Setup](#) section for more information about connecting expansion valve drivers.

Figure 5: Expansion valve driver

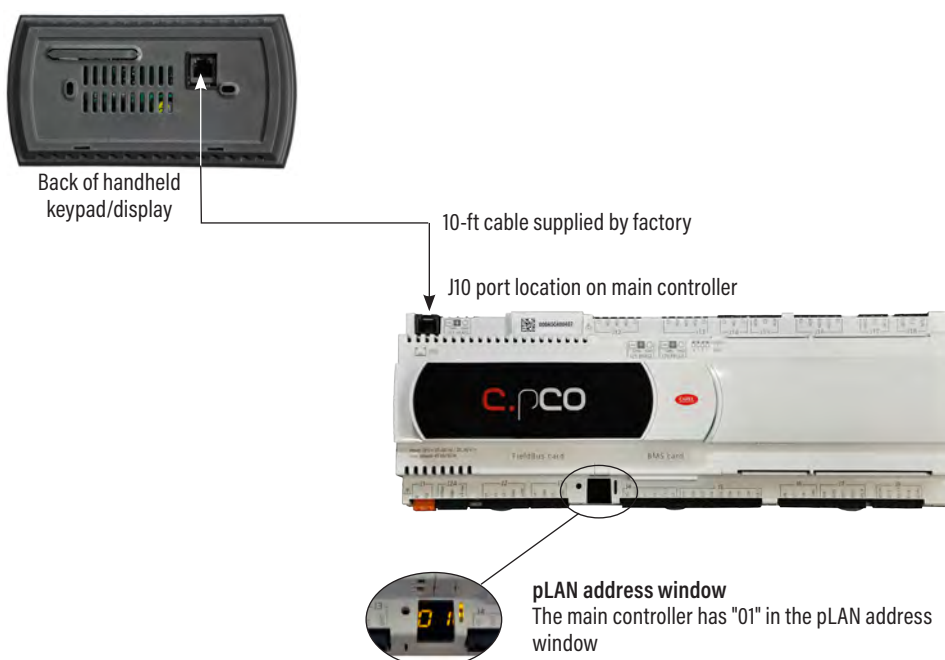


SETUP

CONNECTING THE HANDHELD KEYPAD/DISPLAY

A factory-supplied 10-ft 6-wire straight-through cable provides data transmission and power for the handheld keypad/display. Connect this cable to the back of the keypad/display and to the J10 port of the main controller. The main controller has "01" in the pLAN address window.

Figure 6: Connecting the handheld keypad/display to the main controller



CONNECTING TO THE WEB INTERFACE

To access the controller from a computer, tablet, or smart phone connected to the network on which the controller resides, enter the controller's IP address into your device's web browser. Units are configured at the factory with this IP address: 192.168.1.101. See the [Addresses](#) section for more information.

SERVICE PASSWORD

A service password is required to change or enter some settings. To gain read-write service-level access, go to the **Main/Ctrl Variables/Advanced/Login** screen. Press the **Enter** button to highlight the password field, and the **Up** or **Down** arrow buttons to enter the service password, which is 9998. See the [Navigation](#) section if you need help accessing this screen.

STARTUP SETTINGS

Most controller settings are configured at the factory. However, the settings described below must be defined before unit startup. To enter or change these settings requires service-level access. See the [Service password](#) and [Navigation](#) sections if you need help accessing these screens.

- Time and date
Go to the **Main/Ctrl Variables/Advanced/Unit Settings** screen.
- Altitude
Go to the **Main/Ctrl Variables/Advanced/Unit Settings** screen.
- IP address
Go to the **Main/Ctrl Variables/Advanced/Network Settings** screen.
See also the [IP address](#) section below.
- BMS communication
Go to the **Main/Ctrl Variables/Advanced/Network Settings** screen to set up network communication.

ADDRESSES

pLAN ADDRESSES

Control components are assigned the following pLAN addresses at the factory:

- Carel c.pCO main controller: 01
- Carel c.pCO expansion boards: 02, 03, 04, 05, 06, 07
- Handheld keypad/display: 32

pLAN addresses are visible on the main controller and on c.pCO expansion boards as shown below.

Figure 7: pLAN address window on main controller and c.pCO expansion boards

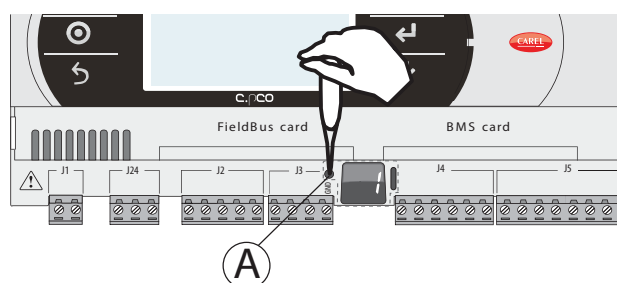


CHANGING THE pLAN ADDRESS

To change the pLAN address (see [Figure 8](#)):

1. Use the tip of a screwdriver to press button A for 5 seconds. The pLAN address brightens.
2. Press button A repeatedly to change the address.
3. Release the button. After a few seconds the brightness decreases and the pLAN address is saved in memory.

Figure 8: Changing the pLAN address



EXPANSION BOARD ADDRESSES AND DIP SWITCH SETTINGS

Valent and Innovent systems use Carel c.pCO and c.pCOe expansion boards when additional inputs or outputs are required.

- See the following pages for more information and standard Valent terminal connection points for c.pCOe expansion boards.
- See the wiring schematics shipped with your unit for factory-configured expansion board connection points for all units.

Figure 9: Carel c.pCOe expansion board.

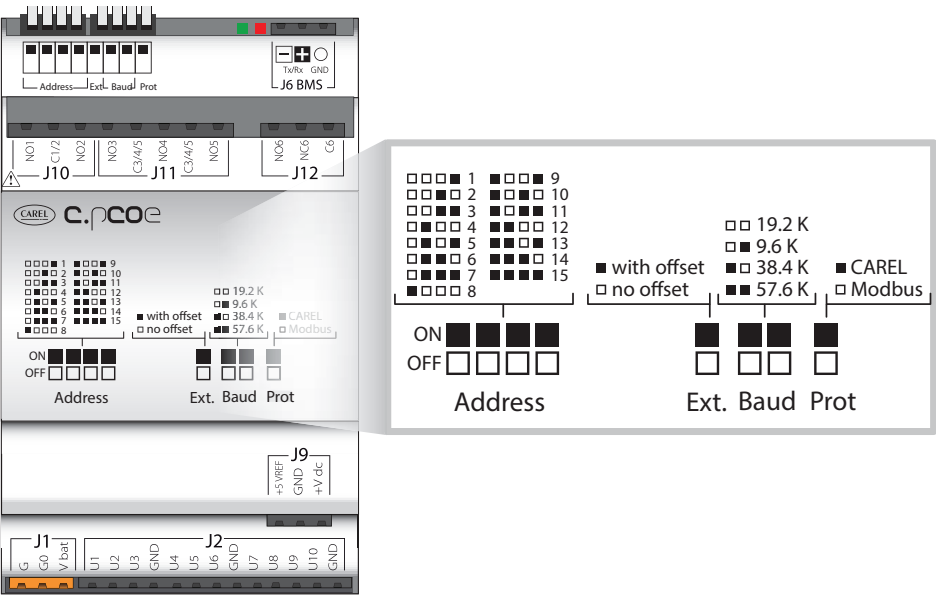


TABLE 1: DIP SWITCH SETTINGS FOR CAREL c.pCOe EXPANSION BOARD, VALENT AND INNOVENT UNITS ^a												
Expansion board	Address	Offset	Baud rate	Protocol	Address				Ext	Baud		Prot
Exp 1	2	No	19.2 K	Modbus	Off	Off	On	Off	Off	Off	Off	Off
Exp 2	3	No	19.2 K	Modbus	Off	Off	On	On	Off	Off	Off	Off
Exp 3	4	No	19.2 K	Modbus	Off	On	Off	Off	Off	Off	Off	Off
Exp 4	5	No	19.2 K	Modbus	Off	On	Off	On	Off	Off	Off	Off
Exp 5	6	No	19.2 K	Modbus	Off	On	On	Off	Off	Off	Off	Off
Exp 6	7	No	19.2 K	Modbus	Off	On	On	On	Off	Off	Off	Off
Note a See Figure 9 : Carel c.pCOe expansion board												

IP ADDRESS

The controller's IP address must be unique within its TCP/IP network. The controller may have a DHCP server-assigned address or a manually-assigned static IP address. IP addresses are configured at the factory as follows:

- DHCP: off
- IP address: 192.168.1.101
- Subnet mask: 255.255.255.0
- Gateway: 192.168.1.1
- DNS: 0.0.0.0

The controller's default address may need to be changed. This address can be set manually at the **Main/Ctrl Variables/Advanced/Network Settings** screen. A service-level password is required to change this setting; see the [Service password](#) section.

I/O TERMINAL CONNECTIONS

TERMINAL LOCATIONS

I/O terminal connections for Valent and Innovent units are identified on wiring schematics shipped with each unit. Valent terminal connections are also shown on the following pages.

Note: because all Innovent units are configured to order, their connection points are identified only on wiring schematics.

IDENTIFYING INPUT AND OUTPUT TERMINALS

The following terminal markings are on the control boards (see [Figure 10](#)) and indicate:

- ID: digital inputs
- NO: normally-open digital outputs
- NC: normally-closed digital outputs
- Y: analog outputs
- U: universal (for analog inputs or outputs, or digital inputs)

Note: all inputs and outputs are assigned to specific terminals at the factory.

CONTROL BOARD TERMINAL CONNECTIONS

Innovent units use Carel c.pCO control boards in multiple sizes. Valent units use medium Carel c.pCO boards.

- See the large Carel c.pCO board in [Figure 10](#) for general board layout.
- See the tables on the following pages for standard Valent terminal connection points.
- See the wiring schematics shipped with your unit for factory-configured terminal connection points for all units.

Figure 10: Carel c.pCO large control board

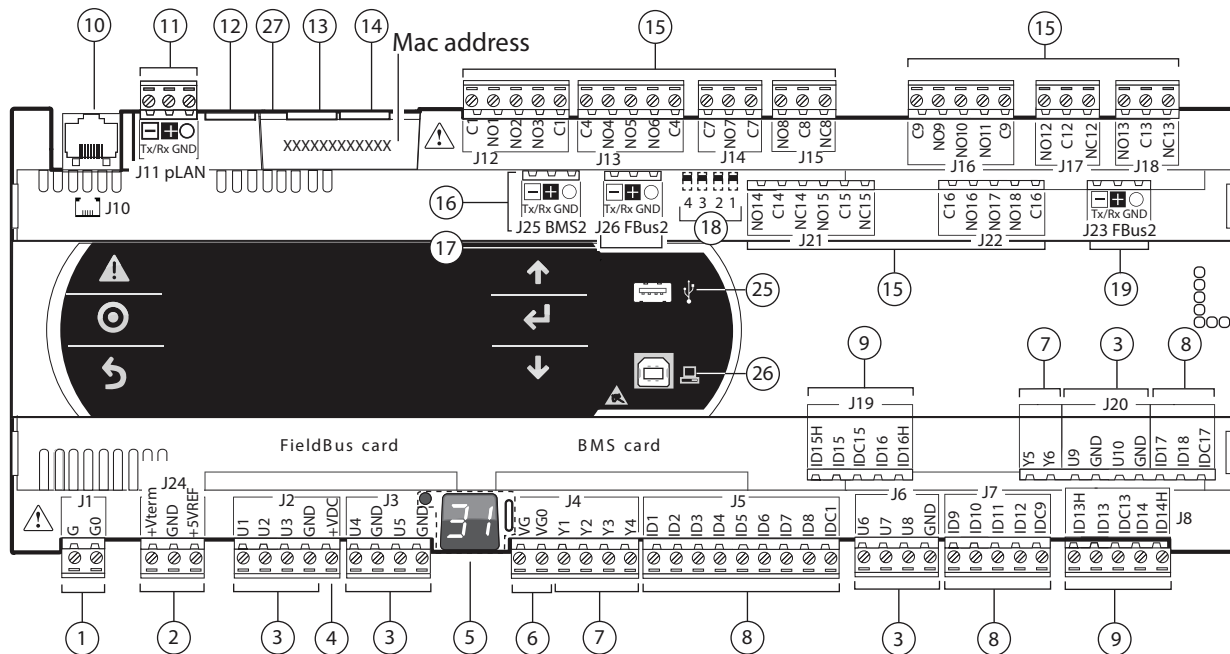


TABLE 2: CAREL c.pCO LARGE CONTROL BOARD TERMINAL CONNECTIONS ^a					
Dwg. ref. ^a	Description	Valent connections	Dwg. ref. ^a	Description	Valent connections
1	Power connection [G(+), G0(-)]		12	Reserved	
2	+Vterm: power supply for additional terminal +5 VREF: power supply for ratiometric probes		13	Ethernet port 1	
3	Universal inputs/outputs	See Table 3 .	14	Ethernet port 2	
4	+Vdc: power supply for active probes		15	Relay digital outputs	See Table 3 .
5	Button for setting pLAN address, second display, LED		16	BMS2 port	
6	VG: power supply at voltage A ^a for opto-isolated analog output VG0: power to optically-isolated analog output, 0 Vac/Vdc		17	Fieldbus2 port	
7	Analog outputs	See Table 3 .	18	Jumpers for selecting fieldbus/BMS	
8	ID: digital inputs for voltage A ^b	See Table 3 .	19	Fieldbus2 port	
9	ID: digital inputs for voltage A ^b IDH: digital inputs for voltage B ^c	See Table 3 .	25	USB host port (master)	
10	pLAN telephone connector for handheld keypad/display		26	USB device port (slave)	
11	pLAN connection. Do not use.		27	Faston for earth connection to Ethernet port	

Notes:

^a See [Figure 10](#): Carel c.pCO large control board for terminal locations.
Innovent units are configured to order and frequently use the Carel c.pCO large board shown in Figure 9.
Valent units use a Carel c.pCO medium board, which is similar to the Carel c.pCO large board, except there are no J19, J20, J21, J22, or J23 terminals.
I/O terminal connections for Valent and Innovent units are identified on wiring schematics shipped with each unit. Valent terminal connections are also shown on Tables 3–7.

^b Voltage A: 24 Vac or 28–36 Vdc
^c Voltage B: 230 Vac, 50/60 Hz

CAREL c.pCO MEDIUM CONTROL BOARD, VALENT TERMINAL CONNECTIONS

TABLE 3: CAREL c.pCO MEDIUM CONTROL BOARD, VALENT TERMINAL CONNECTIONS ^a					
ANALOG INPUTS					
Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type	Range
3	J2	U1	Refrigerant pressure transducer, Circuit A ^b	0.5–4.5 V ^c	0–650 psig
3	J2	U2	Refrigerant pressure transducer, Circuit B ^d	0.5–4.5 V ^c	0–650 psig
3	J2	U3	Supply air temperature	Carel NTC 10K Type 4	
3	J3	U4	Cooling coil leaving air temperature	Carel NTC 10K Type 4	
3	J3	U5	Outside air temperature	Carel NTC 10K Type 4	
3	J6	U6	Outside air humidity	0–10 Vdc	0–100%
3	J6	U7	Used as analog output. See analog outputs section of this table.		
3	J6	U8	Used as analog output. See analog outputs section of this table.		
DIGITAL INPUTS					
Drawing reference ^a	Terminal	Label	Valent unit connection	Position indicates	
8	J5	ID1	Supply fan status	Closed = fan on	
8	J5	ID2	High pressure switch, Circuit A	Closed = normal	
8	J5	ID3	Low pressure switch, Circuit A	Closed = normal	
8	J5	ID4	Occupancy input, BMS input	Closed = occupied	
8	J5	ID5	OA/RA damper end switch	Closed = end switch made and damper(s) open	
8	J5	ID6	Shutdown input, BMS input	Closed = run	
8	J5	ID7	High pressure switch, Circuit B ^e	Closed = normal	
8	J5	ID8	Low pressure switch, Circuit B ^e	Closed = normal	
8	J7	ID9	Exhaust fan status	Closed = fan on	
8	J7	ID10	Filter pressure switch	Closed = dirty filter alarm	
8	J7	ID11	Energy recovery wheel status	Closed = stopped alarm	
8	J7	ID12	Low temp protection input, freeze stat ^f	Closed = normal	
9	J8	ID13H	Unassigned		
9	J8	ID13	Condensate drain pan switch	Closed = alarm	
9	J8	ID14	Remote start input, BMS input	Closed = run	
9	J8	ID14H	Unassigned		
Table continues on next page ►					
Notes:					
a See Figure 10 : Carel c.pCO large control board for terminal locations					
b Units with active head pressure control only					
c Ratiometric transducers					
d Units with active head pressure control and more than one compressor					
e Units with more than one compressor					
f Chilled water or hot water units only					

CAREL c.pCO MEDIUM CONTROL BOARD, VALENT TERMINAL CONNECTIONS (continued)

TABLE 3: CAREL c.pCO MEDIUM CONTROL BOARD, VALENT TERMINAL CONNECTIONS ^a					
ANALOG OUTPUTS					
Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type	Range
7	J4	Y1	Modulating compressor output or cooling capacity output ^b	Use-dependent	0-100%
7	J4	Y2	Condenser fan VFD output Circ. A; or water valve output Circ. A ^c	0-10 Vdc	0-100%
7	J4	Y3	Hot gas reheat valve output	0-10 Vdc	0-100%
7	J4	Y4	Condenser fan VFD output Circ. B ^d or water valve output Circ. B ^e	0-10 Vdc	0-100%
3	J6	U7	OA/RA damper output	0-10 Vdc	0-100%
3	J6	U8	Supply fan speed output	0-10 Vdc	0-100%
DIGITAL OUTPUTS					
Drawing reference ^a	Terminal	Label	Valent unit connection	Position indicates	
15	J12	N01	Compressor 1 start	Closed = start compressor	
15	J12	N02	Compressor 2 start ^f	Closed = start compressor	
15	J12	N03	Compressor 3 start ^g	Closed = start compressor	
15	J13	N04	Compressor 4 start ^g	Closed = start compressor	
15	J13	N05	Supply fan start	Closed = start fan	
15	J13	N06	Exhaust fan start	Closed = start fan	
15	J14	N07	Actuator power	Closed = enabled	
15	J15	N08	Global alarm output, BMS output	Closed = enabled	
15	J15	NC8	Unassigned		
15	J16	N09	Condenser fan VFD start ^h	Closed = start condenser fan	
15	J16	N010	Condenser fan stage 2 start ⁱ	Closed = start condenser fan	
15	J16	N011	Condenser fan stage 3 start ⁱ	Closed = start condenser fan	
15	J17	N012	Unassigned		
15	J17	NC12	Inverter scroll compressor E-stop ^j	Open = stop compressor	
15	J18	N013	Reversing valve output ^k	Closed = heating	
15	J18	NC13	Unassigned		
Notes: a See Figure 10 : Carel c.pCO large control board for terminal locations b Chilled water option, no compressors (0-10 Vdc, direct or reverse) c Water source heat pump units only d 352 casing with Active Head Pressure Control 2.0 e Water source heat pump units with more than one compressor f Units with more than 1 compressor g Units with 4 compressors h Active head pressure control only i Active Head Pressure Control 1.0 only j Units with inverter scroll compressor k Heat pump units					

CAREL c.pCOe EXPANSION BOARDS

Figure 11: Carel c.pCOe expansion board

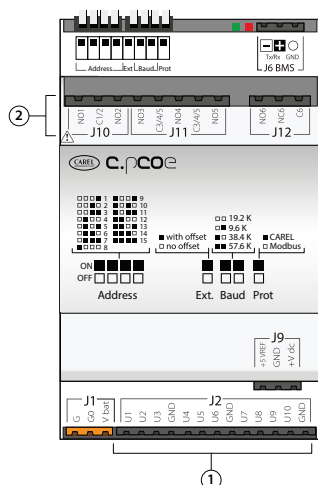


TABLE 4: CAREL c.pCOe EXPANSION BOARD 1 (EXP 1), VALENT TERMINAL CONNECTIONS ^a

ANALOG INPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type	Range
1	J2	U1	Used as analog output. See analog outputs section of this table.		
1	J2	U2	Used as analog output. See analog outputs section of this table.		
1	J2	U3	Used as analog output. See analog outputs section of this table.		
1	J2	U4	Space temperature	Carel NTC 10K Type 4	
1	J2	U5	Mixed air temperature	Carel NTC 10K Type 4	
1	J2	U6	Exhaust air temperature	Carel NTC 10K Type 4	
1	J2	U7	Space humidity	0-10 Vdc	0-100%
1	J2	U8	Space static pressure	0-10 Vdc	-0.5-0.5" wc
1	J2	U9	Supply air duct static pressure	0-10 Vdc	0 to 5.0" wc
1	J2	U10	Space setpoint adjustment	Resistance 0 to 10 kΩ	-3.0-3.0 Δ °F

ANALOG OUTPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type	Range
1	J2	U1	Heating capacity output ^b	0-10 Vdc	0-100%
1	J2	U2	Exhaust fan speed output	0-10 Vdc	0-100%
1	J2	U3	Energy recovery capacity output – damper or wheel ^c	0-10 Vdc	0-100%

DIGITAL OUTPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Position indicates
2	J10	N01	Energy recovery wheel start	Closed = rotating
2	J10	N02	Unassigned	
2	J11	N03	Gas furnace heating stage 1 enable	Closed = stage enabled
2	J11	N04	Gas furnace heating stage 2 enable	Closed = stage enabled
2	J11	N05	Gas furnace heating stage 3 enable	Closed = stage enabled
2	J12	N06	Preheater enable	Closed = start heater
2	J12	NC6	Unassigned	

Notes:

^a See Figure 11: Carel c.pCOe expansion board

^b Gas furnace, electric heat, or hot water

^c Heat wheel speed or heat exchanger face/bypass damper, 100% = full energy recovery

TABLE 5: CAREL c.pCOe EXPANSION BOARD 2 (EXP 2), VALENT TERMINAL CONNECTIONS ^a

ANALOG INPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type	Range
1	J2	U1	Analog output		
1	J2	U2	Space CO2 level	0–10 Vdc	0–2000 ppm
1	J2	U3	Outside air flow measuring station	0–10 Vdc	0–1" wc or 0–0.5" wc
1	J2	U4	Supply fan air flow measuring station	0–10 Vdc	0–30" wc
1	J2	U5	Exhaust fan air flow measuring station	0–10 Vdc	0–30" wc
1	J2	U6	OA/RA damper control, BMS input ^b	0–10 Vdc	0–100%
1	J2	U7	Supply fan control, BMS input ^c	0–10 Vdc	0–100%
1	J2	U8	Exhaust fan control, BMS input ^c	0–10 Vdc	0–100%
1	J2	U9	Unassigned		
1	J2	U10	Used as digital input. See digital inputs section of this table.		

ANALOG OUTPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type	Range
1	J2	U1	Electric heat capacity output ^d	0–10 Vdc	0–100%

DIGITAL OUTPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Position indicates
2	J10	N01	Unassigned	
2	J10	N02	Unassigned	
2	J11	N03	Unassigned	
2	J11	N04	Unassigned	
2	J11	N05	Unassigned	
2	J12	N06	Unassigned	
2	J12	NC6	Unassigned	

Notes:

a See [Figure 11](#): Carel c.pCOe expansion board

b User-selectable input type: 0–10 Vdc, 2–10 Vdc, or 4–20 mA

c Heat wheel speed or heat exchanger face/bypass damper, 100% = full energy recovery

d Combination gas and electric heat (temperator)

TABLE 6: CAREL c.pCOe EXPANSION BOARD 3, WATER SOURCE HEAT PUMP (WSHP EXP), VALENT TERMINAL CONNECTIONS ^a**ANALOG INPUTS**

Drawing reference ^a	Terminal	Label	Valent unit connection	Sensor type
1	J2	U1	Entering water temperature, Circuit A	Carel NTC 10K Type 4
1	J2	U2	Leaving water temperature, Circuit A	Carel NTC 10K Type 4
1	J2	U3	Unassigned	
1	J2	U4	Entering water temperature, Circuit B	Carel NTC 10K Type 4
1	J2	U5	Leaving water temperature, Circuit B	Carel NTC 10K Type 4
1	J2	U6	Unassigned	
1	J2	U7	Used as digital input. See digital inputs section of this table.	
1	J2	U8	Unassigned	
1	J2	U9	Unassigned	
1	J2	U10	Unassigned	

DIGITAL INPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection	Position indicates
1	J2	U7	Water leak detector ^b	Closed = alarm

DIGITAL OUTPUTS

Drawing reference ^a	Terminal	Label	Valent unit connection
2	J10	N01	Water pump enable ^c
2	J10	N02	Unassigned
2	J11	N03	Unassigned
2	J11	N04	Unassigned
2	J11	N05	Unassigned
2	J12	N06	Unassigned
2	J12	NC6	Unassigned

Notes:a See [Figure 11](#): Carel c.pCOe expansion board

b Valent 350 casing water source heat pump

c Optional use hardwire output for water source heat pump

EXPANSION VALVE DRIVER TERMINAL CONNECTIONS

Valent systems use Carel EVD evolution expansion valve drivers to control electronic expansion valves, if equipped.

- See the figure and table below for terminal connection points for Valent units.
- See the wiring schematics shipped with your unit for factory-configured connection points for all units.

Figure 12: Carel EVD evolution expansion valve driver

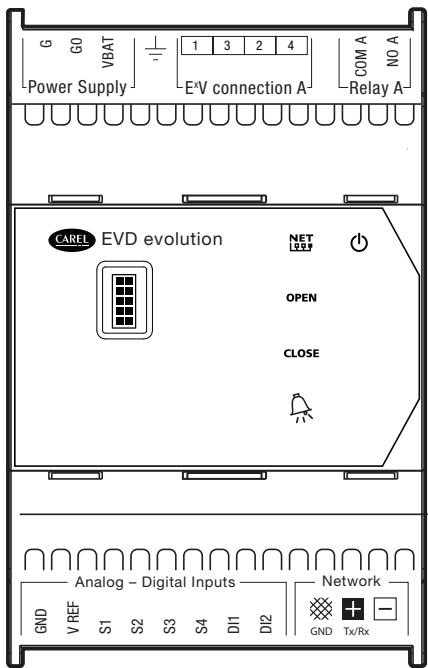


TABLE 7: CAREL EVD EVOLUTION EXPANSION VALVE DRIVER, VALENT TERMINAL CONNECTIONS ^{a, b}			
ANALOG INPUTS			
Label	Valent unit connection	Sensor type	Range
S1	Suction refrigerant pressure transducer	0.5–4.5 V ^c	0–250.0 psig
S2	Suction refrigerant temperature	Carel NTC 10K Type 4	
S3	Unassigned		
S4	Discharge refrigerant temperature	Carel NTC 10K Type 4 HT	
DIGITAL INPUTS			
DI1	Unassigned		
DI2	Unassigned		
ELECTRONIC EXPANSION VALVE			
1	Carel ExV (green)		
3	Carel ExV (brown)		
2	Carel ExV (yellow)		
4	Carel ExV (white)		
Notes: a See Figure 12 : Carel EVD evolution expansion valve driver b Units with inverter scroll compressor c Ratiometric transducer			

OPERATION

NAVIGATION

The handheld keypad/display and the virtual keypad/display on the web interface function similarly. Button functions are described in [Table 8](#).

Figure 13: Handheld keypad/display



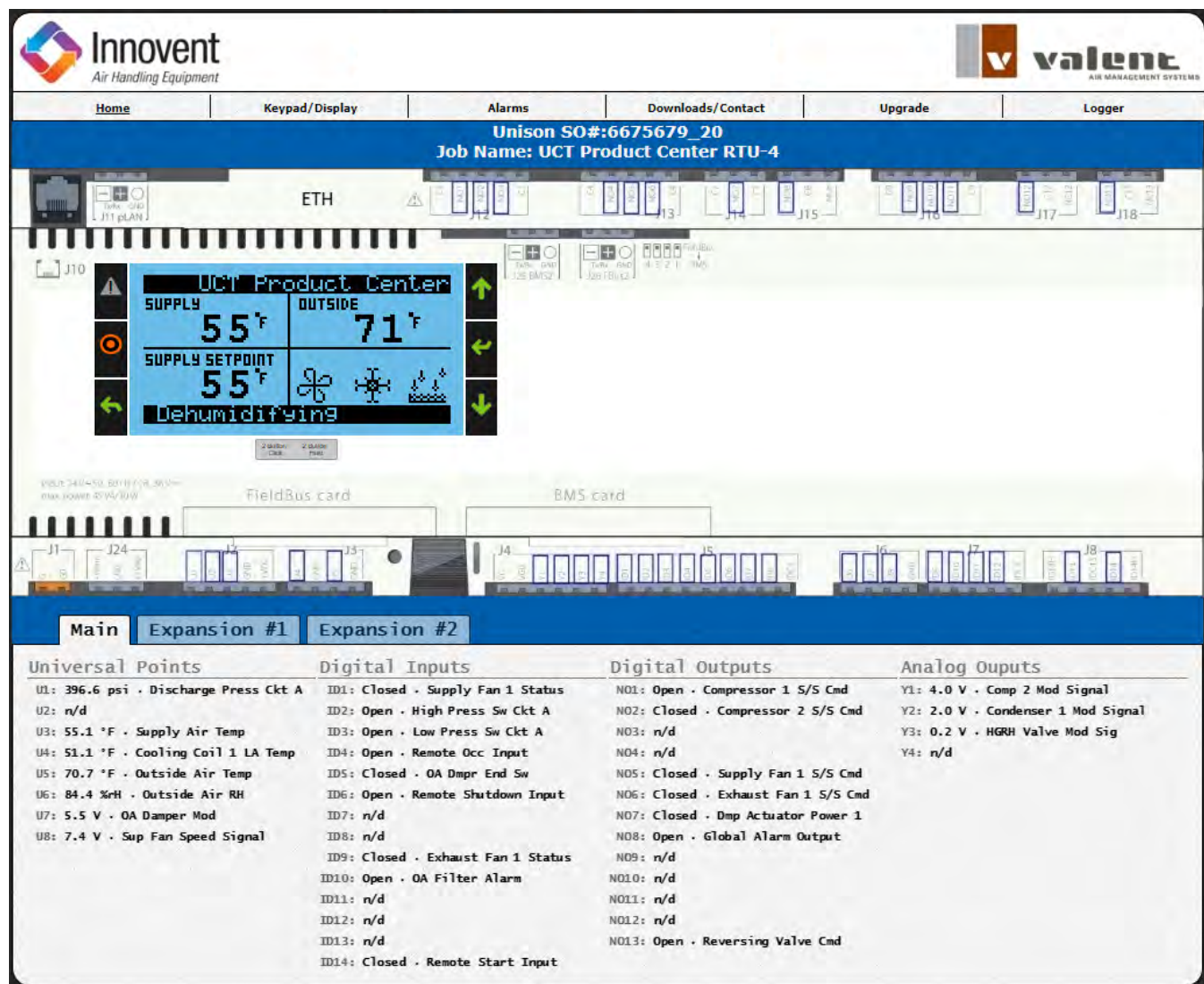
Figure 14: Virtual keypad/display on the web interface



TABLE 8: KEYPAD/DISPLAY BUTTON FUNCTIONS (FOR HANDHELD KEYPAD DISPLAY AND VIRTUAL KEYPAD/DISPLAY ON THE WEB INTERFACE)		
BUTTON	DESCRIPTION	FUNCTIONS
	Main Menu (target button)	Press to go directly to the Main Menu from any screen. Backlight indicates that the unit is enabled. From the Main Menu , navigate to the following screens (see also the Menu map section): • Unit Enable • Unit Status • Ctrl Variables • Alarm Menu
	Alarm	The Alarm button flashes when there is an active alarm. Press to view active alarms. Press twice to go to the alarms reset screen.
	Escape	Press from the Main Menu to view the Unit Status screen. Press to go one menu level back. Press when editing a variable to cancel editing.
	Up	Press to navigate through the menus/screens. Press after entering a variable to increase a current value.
	Enter	Press to enter a highlighted menu or screen item. Press to enter a writable variable and press again to confirm the new variable value.
	Down	Press to navigate menus/screens. Press after entering a variable to decrease the current value.
		Virtual keypad/display on web interface only These two buttons on the virtual keypad/display are used to simulate two-button actions on the handheld keypad/display. To simulate pressing two buttons simultaneously: 1. Click on 2-Button Click . 2. Then, sequentially click on two keypad buttons (Main, Alarm, Escape, Up, Enter, Down). To simulate pressing and holding two buttons simultaneously: 1. Click on 2-Button Hold . 2. Then, sequentially click on two keypad buttons (Main, Alarm, Escape, Up, Enter, Down).

WEB INTERFACE

Figure 15: Web interface Home screen

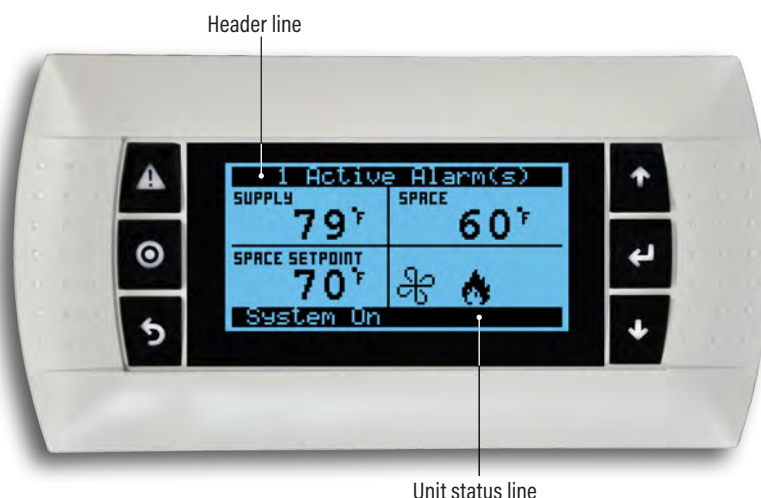


Click on tabs at the top of the web interface screen to access the following:

- **Home.** Includes a functioning keypad/display and lists of I/O terminal connections and values by board.
- **Keypad/display.** Includes a larger functioning keypad/display than the one found on the Home screen.
- **Alarms.** Shows current and cleared alarms.
- **Downloads/Contact.** Includes links to manuals and contact information.
- **Upgrade.** Upgrade controller software from this screen.
- **Logger.** View data trends and create live trends from this screen.

MAIN STATUS SCREEN

Figure 16: Main status screen



The Main Status screen displays current operating information. This screen includes:

- **Header line.** The header line alternates between the job name and the unit tag. If there are active alarms, the number of active alarms is displayed instead of the job information.
- **Unit status line.** System startup information and unit operation status appears here.
- **Four quadrants** that have information that may change every three seconds, depending on options and sensors installed:
 - Upper left quadrant: displays the current value of the primary control variable. For example, this could be supply air temperature, room air temperature, return air temperature, or coil leaving temperature.
 - Upper right quadrant: displays all temperature and humidity values that pertain to the air handler.
 - Lower left quadrant: displays the setpoint that corresponds to the primary control variable in the upper left quadrant and may rotate through other setpoints.
 - Lower right quadrant: displays animated symbols that represent current unit operation. These symbols are described in [Table 9](#).

TABLE 9: SYMBOLS IN LOWER RIGHT QUADRANT OF MAIN STATUS SCREEN

SYMBOL	NAME	INDICATES
	Fan blades	Supply air fan status. Rotation indicates airflow; static blades indicate no airflow.
	Snowflake	Cooling
	Flame	Heating
	Air currents	Economizing
	Rain	Dehumidifying
	Vapor spray	Humidifying

MENU MAP

The Menu Map shows screen order when using either the handheld keypad/display or the virtual keypad/display on the web interface. See the [Navigation](#) section for instructions about moving through menu screens.

Note: all screens are not available on every unit.

MAIN MENU				
UNIT ENABLE	UNIT STATUS		CTRL VARIABLES	
	Main Status		Temp Control	
	Input Output Status		Dehumidification	
	Note: Additional status screens are displayed depending on unit configuration. Screens may include, but are not limited to: Occupancy Damper positions Fan status Airflow Setpoints Economizer Energy recovery Cooling Circuit pressure Heating Dehumidification Humidification Static pressure Multizone air conditions		Humidification	
			Refrigeration	Compressor Control
				Pressure Control
				Heat Pump Control
			MultiZone Ctrl	
			Evap Cooling	
			Damper Control	
			Energy Recovery	
			Fan Control	Supply Fans Control
				Exhaust Fans Control
				Return Fan Control
				Scavenger Fan Control
				Regeneration Fan Control
			Occupancy	
			Advanced Note: The Advanced menu is read-only. The service password is required to change these settings. See the Service password section.	Login
				Manual Overrides
				Adv. Setpoints
				Network Settings
				Backup/Restore
				IO Status/Offset
				IO Config
				Unit Config
				Unit Settings
				Service Info
				Alarm Management
				Shutdown Alarms
				General Alarms
			ALARM MENU	
			Active Alarms	
			Reset Alarms	
			Alarm History	
			Clear History	
			Export History	

Figure 17: Ctrl Variables Menu shown on a handheld keypad/display

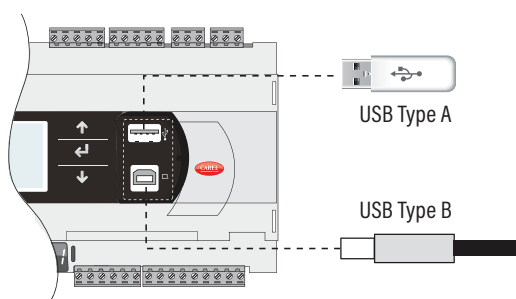


SOFTWARE BACKUP AND RESTORE

CONNECTING TO USB DRIVES

The controller has built-in USB ports for connecting to USB drives. The USB drives can be used for backing up all settings and reported conditions such as alarm history and current values.

Figure 18: USB port locations



CREATING A BACKUP FILE

The controller can create a backup file of setpoints and configuration variables on a USB drive or in the controller's internal memory. This creates a file named User_Backup.txt.

IMPORTANT:

- At first startup or commissioning, or prior to communicating with Valent or Innovent Technical Support about performance issues, we recommend creating a backup file for each controller.
- Name each file with the unit sales order-line number found on the silver nameplate attached to the electrical access door.
- We recommend emailing these files to Valent or Innovent Technical Support:
Valent: support@doas.com
Innovent: support@innoventair.com
- Also consider creating a backup file whenever significant program changes are made.

To create a system backup file using the handheld or virtual keypad/display buttons:

1. Go to the **Main Menu/Ctrl Variables/Advanced/Login** screen. Press the **Enter** and **Up** or **Down** arrow buttons to enter the service password, which is 9998.
2. Go to the **Main Menu/Ctrl Variables/Advanced/Backup/Restore** screen.
3. Press the **Up** or **Down** arrow buttons to navigate to the **Backup Settings** screen.
4. Press the **Enter** and **Up** or **Down** arrow buttons to select the backup location (internal memory or USB). If creating a backup to a USB drive, insert a USB drive into the main controller (see [Figure 18](#)).
5. Press **Enter** to highlight and then the **Up** or **Down** arrow buttons to fill the **Save** checkbox. This action creates the backup file.

RESTORING FROM A BACKUP FILE

FROM USB

1. Place the restore file in the root directory of a USB drive. (Do not place the file within a folder on the USB drive.) The file must be named: User_Backup.txt
2. Insert the USB drive into the controller's USB port.
3. Go to the **Main Menu/Unit Enable** screen. Press the **Enter** and **Up** or **Down** arrow buttons to disable the unit.
4. Go to the **Main Menu/Ctrl Variables/Advanced/Login** screen. Press the **Enter** and **Up** or **Down** arrow buttons to enter the service password, which is 9998.
5. Go to the **Main Menu/Ctrl Variables/Advanced/Backup/Restore** screen.
6. Press the **Up** or **Down** arrow buttons to navigate to the **USB Restore** screen.
7. Press **Enter** to highlight and then the **Up** or **Down** arrow buttons to fill the **Restore** checkbox. This action restores the backup file. If there is an error during the process, the specific error is displayed on this screen.
8. Cycle power to the controller.

FROM INTERNAL MEMORY

1. Go to the **Main Menu/Unit Enable** screen. Press the **Enter** and **Up** or **Down** arrow buttons to disable the unit.
2. Go to the **Main Menu/Ctrl Variables/Advanced/Login** screen. Press the **Enter** and **Up** or **Down** arrow buttons to enter the service password, which is 9998.
3. Go to the **Main Menu/Ctrl Variables/Advanced/Backup/Restore** screen.
4. Press the **Up** or **Down** arrow buttons to navigate to the **Internal Restore** screen. This screen is only available when a backup file exists in internal memory.
5. Press **Enter** to highlight and then the **Up** or **Down** arrow buttons to fill the **Restore** checkbox. This action restores the backup file. If there is an error during the process, the specific error is displayed on this screen.
6. Cycle power to the controller.

SEQUENCE OF OPERATION

Note: Sequence of operation varies based on unit configuration. See submittal documentation for configuration detail. Custom applications may have sequences that vary from those described below.

1. UNIT AVAILABILITY

A. Unit start command

The unit is available for operation when the following conditions are met:

- After powering up and a five-second initial delay
- There are no active shutdown alarms.
- The unit has been enabled at the **Unit Enable** screen or by the building management system (BMS), and the unit service switch, if installed, is in the on position.

2. UNIT COMMANDS

A. Occupied start

The unit operates in the occupied mode under any of the following conditions, based on user selection:

- BMS command
- Digital hardwired input
- Daily schedule
- Always occupied
- Always unoccupied

1) Occupied auto mode

In occupied auto mode, if space reset is enabled, the unit cycles on and off based on space temperature. The unit starts when the space temperature exceeds the setpoint plus a deadband. The unit transitions to off/standby when the setpoint is achieved.

2) Occupancy timed override input

A user can override the unit, placing it into occupied mode by pressing the occupancy override button. The unit then remains occupied for the occupancy override duration.

B. Unoccupied start

The unit operates in the unoccupied mode under any of the following conditions:

- Unoccupied heating
- Unoccupied cooling
- Unoccupied humidification
- Unoccupied dehumidification
- Unoccupied multizone heating
- Unoccupied multizone cooling

C. System on

System on mode occurs when there is an active occupied or unoccupied start command. When a start command becomes active the following steps occur:

- Actuators are powered.
- Fan damper delay timers start counting down from their initial value.
- Individual fan delays start counting down from their initial value.
- Fans are commanded on after timers have expired, and damper end switches prove dampers are open.
- The startup delay timer starts counting down from its initial value.
- After the startup delay timer expires, thermodynamic sequences are allowed.

1) Power loss auto restart

If power loss auto restart is enabled, the unit returns to the last known running state based on the unit enable value after an application restart or power loss. If power loss auto restart is disabled, the unit remains off until commanded on.

2) Shutdown alarm auto restart

If the shutdown alarm auto restart is enabled, the unit remains enabled while a shutdown alarm is active, allowing the unit to automatically restart after a shutdown alarm is cleared. If the shutdown alarm auto restart is disabled, the unit is disabled when there is an active shutdown alarm. This requires the unit to be re-enabled manually after the shutdown alarm condition is cleared.

D. Off/standby

Standby occurs when there is not an occupied or unoccupied start command.

1) Hard shutdown

A hard shutdown occurs under the following conditions:

- A user or the BMS disables the system, and the supply temperature is less than the soft shutdown enable setpoint.
- The service switch is in the off (disabled) position.
- Occupancy is commanded to unoccupied while there is no unoccupied start command, and the supply temperature is less than the soft shutdown enable setpoint.

When a hard shutdown occurs:

- The unit shuts down immediately; **and**
- Dampers spring-return to their off position.

2) Soft shutdown

A soft shutdown occurs under the following conditions:

- A user or the BMS disables the system, and the supply temperature is greater than or equal to the soft shutdown enable setpoint.
- There is no unoccupied or occupied start command and the supply temperature is greater than or equal to the soft shutdown enable setpoint.

The following occurs during a soft shutdown:

- Thermodynamic outputs immediately revert back to their off value; *while*
- Dampers remain open and fans continue to run; *until*
 - The supply air temperature falls below the soft shutdown enable setpoint minus 5.0 °F; *or*
 - The soft shutdown delay timer has expired.

E. System disabled

The unit becomes disabled due to the following:

- The unit was disabled from the Valent or Innovent controller's **Main Menu/Unit Enable** screen.
- The unit was disabled from the BMS.
- The service switch is in the off position.
- The shutdown input is in the shutdown position.
- A shutdown alarm was activated.

When disabled the following actions occur:

- The unit shuts down immediately; *and*
- Dampers spring-return to their off position.

3. DAMPER SEQUENCES

A. Outside air damper

The outside air damper modulates based on the maximum value of the following control options:

- CO₂ control
- Economizer
- Outside air damper cfm
- Pool dewpoint
- Space static pressure

The final outside air damper position command is constrained by the outside air damper minimum and maximum setpoints. The maximum outside air damper position may be limited by one of the following:

- Heat pump defrost
- Winter ramp

B. Minimum outside air damper

The minimum outside air damper modulates to maintain the cfm setpoint. This damper position is constrained by its minimum and maximum setpoints.

C. Return air damper

The return air damper is set to control inversely to the outside air damper. This damper position is constrained by its minimum and maximum setpoints.

D. Recirculation air damper

The recirculation air damper is set to control inversely to the outside air damper. This damper position is constrained by its minimum and maximum setpoints.

E. Exhaust air damper

The exhaust air damper is set to control directly to the outside air damper. This damper position is constrained by its minimum and maximum setpoints.

4. FAN SEQUENCES

A. Supply fan control

The following sequences are selectable for supply fan control. The fan speed is constrained by its minimum and maximum speed setpoints.

- Constant volume
- Duct static pressure
- Space static pressure
- Hardwired input
- Single zone VAV
- cfm control

B. Return fan control

The following sequences are selectable for return fan control. Fan speed is constrained by its minimum and maximum speed setpoints.

- Constant volume
- Return duct static pressure
- Return static with supply tracking
- Space static pressure
- Hardwired input
- Single zone VAV
- Supply tracking with offset

C. Exhaust fan control

The following sequences are selectable for exhaust fan control. Fan speed is constrained by its minimum and maximum speed setpoints.

- Constant volume
- Space static pressure
- Supply tracking with offset
- Pool space static
- cfm control
- Hardwired input
- Return duct static pressure

1) Pool space static pressure

Fans modulate to maintain the space static setpoint. The output of the space static pressure ramp remains within the outside air damper position +/- the pool unit pressure deviation setpoint. The exhaust fan maximum speed limit is selected based on the pool unit winter outside air damper limit setpoint when outside air conditions are below freezing.

D. Scavenger fan control

Constant volume is the only sequence available to control scavenger fans. Fan speed is constrained by its minimum and maximum speed setpoints.

E. Regeneration fan control

Constant volume is the only sequence available to control regeneration fans. Fan speed is constrained by its minimum and maximum speed setpoints.

5. WINTER RAMP

The winter ramp function prevents the supply temperature from dropping below setpoint under the following conditions:

- Outside air temperature is below the winter ramp enable setpoint; **and**
- Heating capacity is at 100%.

One of the following is used to perform the winter ramp function:

- Supply fan speed; **or**
- Outside air damper position.

Note: if the unit is a heat pump, the supply fan is always used.

6. MULTIZONE

For multizone units, each zone has shared heating and cooling setpoints. The setpoints can be offset from each other by adjusting the value of a setpoint slider that is mounted in the zone. The active setpoint is automatically selected based on the current temperature reading in the zone.

A. Demand

- Each zone has an individual heating and cooling demand.
- Hot deck heating is enabled when the average hot deck demand is greater than or equal to the setpoint.
- Cold deck cooling is enabled when the average cold deck demand is greater than or equal to the setpoint.
- Reset control of setpoints is available. When reset is enabled, the hot deck and cold deck setpoints are calculated based on the current hot deck and cold deck demand.

B. Occupied operation

Zone dampers modulate to maintain the active zone setpoint.

C. Unoccupied operation

The unit remains in standby until the number of zones with a heating or cooling demand exceeds the minimum zones required for heating or cooling.

The following occurs when the unit starts:

- Zone dampers drive to the full heating or cooling position based on the current zone temperature and setpoints.
- Cold deck setpoint becomes the supply cooling minimum setpoint.
- Hot deck setpoint becomes the supply heating maximum setpoint.

7. TEMPERATURE CONTROL

Temperature control sequences determine when the unit is in fan-only, heating, or cooling modes. The following control sequences are available:

A. Supply temperature control

The heating and cooling devices modulate to maintain the supply air temperature setpoint.

B. Space or return temperature reset

The supply temperature setpoint is calculated based on the active setpoint and the current space or return temperature. The calculated setpoint is scaled between the supply temperature minimum and maximum setpoints determined by the current mode of operation.

1) Active setpoint

The heating and cooling setpoints are determined by the temperature setpoint and deadband. The deadband is divided by 2 and added to and subtracted from the setpoint to determine the cooling and heating setpoints.

a. Dual setpoint mode

When a deadband value is greater than zero, the unit is placed into dual setpoint mode.

- Cooling: if the space or return temperature is above the cooling setpoint, the cooling setpoint is active.
- Heating: if the space or return temperature is below the heating setpoint, the heating setpoint is active.
- Transitioning between setpoints: if the space or return temperature is between the heating and cooling setpoint, the last active setpoint is used.
- Start between setpoints: if the unit starts while in between setpoints, the heating setpoint is active.

b. Single setpoint mode

If a deadband of zero is entered, the unit is in single setpoint mode and controls directly to the user-entered temperature setpoint.

C. Outside reset

The heating and cooling devices modulate to maintain the supply air temperature setpoint as determined by the outside reset calculation.

- Outside reset calculation: the supply temperature setpoint is scaled between the supply temperature minimum and maximum setpoints as the outside air temperature changes between the outside reset minimum and maximum setpoints.

D. Heat cool mode switch delay

This delay is used in transitioning between heating and cooling modes. The delay timer starts counting when the unit is no longer heating, cooling, or economizing.

1) Enable heating

The unit enables heating when the following occurs:

- All cooling devices are off; **and**
- Economizer is at zero; **and**
- The heat cool mode switch timer has expired; **and**
- Heating is not locked out; **and**
- There is a demand for heating.

2) Enable cooling

The unit enables cooling when the following occurs:

- All heating devices are off; **and**
- The heat cool mode switch timer has expired; **and**
- Cooling is not locked out; **and**
- There is a demand for cooling.

E. Fallback

During a sensor failure the temperature control mode reverts to the previous available option based on the following order:

- Supply temperature control
- Outside air reset
- Space/return reset
 - If both space and return temperature sensors are present, the remaining sensor is used during a failure.

8. POOL SEQUENCES

The following sequences are available only with pool unit applications.

A. Dehumidification

1) Outside air mode

The outside air damper modulates to maintain the pool dewpoint. When mechanical cooling is enabled, the outside air damper remains at its maximum position.

2) Mechanical cooling mode

When dehumidification mode is active, cooling is controlled to maintain the coil leaving air temperature setpoint. Hot gas reheat maintains the supply temperature setpoint. The cooling coil leaving air temperature setpoint resets to maintain the pool dewpoint.

B. Purge mode

1) Initialized

Purge mode can be initialized by the following:

- Through the BMS system; **or**
- By manual user input, using the controller.

2) Purge actions

The following actions occur when purge is initialized:

- The outside air damper modulates to its maximum position.
- The recirculation air damper modulates to its minimum position.
- Dehumidification turns off.
- Cooling turns off.
- Heating is allowed.

3) Terminated

Purge mode can be terminated by the following:

- Through the BMS system; *or*
- By manual user input, using the controller; *or*
- When purge mode reaches the purge time limit.

9. ECONOMIZER

The economizer function is used to modulate the outside air damper in order to cool the supply air temperature using outside air. The outside damper modulates open based on the economizer demand in order to maintain the supply temperature setpoint.

A. Economizer availability

The economizer is available when the following conditions are met:

- Heating is not active; *and*
- Cooling is active; *and*
- The enable condition for the selected mode is met.

B. Economizer modes

The user can select the economizer control method from the following options:

1) Outside dry bulb

Economizing is allowed when the outside dry bulb is less than the economizer temperature enable setpoint.

2) Outside enthalpy

Economizing is allowed when outside enthalpy is less than the economizer enthalpy setpoint.

3) Comparative dry bulb

Economizing is allowed when outside temperature is less than the space or return temperature.

4) Comparative enthalpy

Economizing is allowed when outside enthalpy is less than the space or return enthalpy.

5) Fallback

If enabled, the economizer control mode can revert to the previously available option during a sensor failure to continue economizing.

10. ENERGY RECOVERY

The heat wheel or flat plate heat exchanger face/bypass damper is controlled in order to maintain the supply temperature setpoint.

A. Defrost

Energy recovery devices may require defrosting if the exhaust air temperature gets too cold. The following methods are available depending on the type of energy recovery installed in the unit:

1) Modulating

Energy recovery output is reduced in order to maintain the exhaust air temperature above the defrost setpoint.

2) Fixed capacity

The wheel will be cycled on and off in order to maintain an exhaust temperature above the defrost setpoint. The wheel cycles on for 30 seconds then off for 5 minutes.

B. Wheel pressure drop control

Wheel supply and exhaust bypass dampers modulate to maintain a differential pressure setpoint across the wheel.

C. Heat wheel jog function

Momentarily enables the wheel in order to expose a new section to the air stream.

11. DEHUMIDIFICATION

When dehumidification mode is active, the cooling device is controlled to maintain the cooling coil leaving air temperature setpoint. Reheat or Reheat Plus is controlled to maintain the supply temperature setpoint.

Note: this sequence does not apply to pool application units.

A. Availability

The following must occur to enable dehumidification mode:

- Humidification is not active; **and**
- The humidification/dehumidification mode switch delay has expired; **and**
- Cooling is not locked out (except in the case of a regeneration unit); **and**
- There is a call for dehumidification.

B. Dehumidification call

The dehumidification call can vary based on installed sensors and user selection. Dehumidification is called when a sensor is greater than a dehumidification setpoint.

The following dehumidification modes are available when the space is in occupied mode:

- Inside RH*
- Inside dewpoint*
- Outside dewpoint
- Inside RH **or** inside dewpoint*
- Inside RH **or** inside dewpoint **or** outside dewpoint
- Inside RH **and** inside dewpoint*
- Inside RH **and** inside dewpoint **or** outside dewpoint

Note: * indicates availability during unoccupied mode.

There must be a constant call for dehumidification for the duration of the enable delay for dehumidification mode to become enabled. The call remains active until conditions are satisfied and dehumidification mode has been active for the minimum active time.

1) Unoccupied mode

If the unit is unoccupied while there is a dehumidification call, the unit will start and dehumidify until the unoccupied dehumidification setpoints are satisfied. The above dehumidification modes marked with an * indicate availability during unoccupied mode. The unoccupied dehumidification mode can be set differently than the occupied dehumidification mode.

C. Dehumidification priority

The following priorities are used to determine what is more important in the unit: temperature over dehumidification, or dehumidification over heating. Both priority selections determine when the unit is allowed to dehumidify.

1) Temperature over dehumidification

Determines when the unit is allowed to dehumidify based on the space/return air temperatures.

a. Temperature

If temperature is set as the priority and the space or return air is overcooled, dehumidification is locked out until the space or return temperature is no longer overcooled.

b. Dehumidification

If the priority is dehumidification and the space or return air is overcooled, the coil offset will be added to the coil leaving setpoint.

c. Overcooled

If space or return reset is enabled, the target is considered overcooled when it is 4.0 °F below setpoint for 5 minutes. It remains overcooled until the target is at setpoint and overcool has been active for a minimum of 5 minutes.

2) Heating over Dehumidification

Determines when the unit is allowed to dehumidify when heating is active.

a. Heating

If priority is set to heating, the unit locks out dehumidification while heating is active.

b. Dehumidification

If priority is set to dehumidification, the unit is allowed to switch to dehumidification when heating is active.

12. REGENERATION

Regeneration is an optional method of dehumidification control that uses a separate heated regeneration airstream that assists in dehumidifying the process airstream feeding the space.

A. Regeneration availability

The following must occur to enable regeneration mode:

- Regeneration fan is **not** in alarm; **and**
- All conditions for dehumidification availability are met; see section [11. Dehumidification](#).

B. Regeneration call

See dehumidification call in section [11. Dehumidification](#).

The following occurs during a call for regeneration mode:

- Regeneration damper opens to 100%; **and**
- Starts the regeneration wheel; **and**
- Starts the regeneration fan after the damper end switch is made and the regeneration fan delay has expired.

C. Regeneration fan control

The regeneration fan is constant volume only. The fan variable frequency drive (VFD) is used for manual balancing only.

D. Dehumidification setpoint reset

The controller resets the supply air dewpoint setpoint in order to maintain the space/return dewpoint.

E. Heating (regeneration air)

The regeneration air heating device controls to maintain the supply air dewpoint.

- The controller resets the regeneration wheel inlet temperature setpoint between the minimum and maximum setpoints to maintain the supply air dewpoint.
- Upon failure of the regeneration wheel inlet temperature sensor, regeneration heating modulation is set to 50%.

F. Regeneration system post heat purge mode

Post heat purge mode occurs when the regeneration system transitions from active to inactive.

The following occurs for the duration of the purge mode:

- Regeneration outside air damper is open.
- Regeneration fan is on.
- Desiccant wheel is off.
- Regeneration furnace is off.

13. HUMIDIFICATION

When humidification mode is active, the humidifier output modulates to maintain the active humidity target.

A. Availability

The following must occur to enable humidification mode:

- A delay expires after controls are enabled for heating or cooling; *and*
- Humidification is not locked out; *and*
- The supply RH sensor has a valid reading; *and*
- If in cooling mode, humidification is allowed (if humidification with cooling is enabled); *and*
- The unit is not dehumidifying; *and*
- There is a call for humidification.

B. Humidification call

The humidification call can vary based on installed sensors and the user selection. The control mode selected compares the sensor(s) to the humidification setpoint(s). When the sensor reading is less than the humidification setpoint, humidification is called.

The following humidification modes are available when the space is occupied:

- Supply RH
- Space RH
- Return RH

1) Fallback

The humidification control mode reverts to the previous available option during a sensor failure to continue humidifying.

2) Unoccupied mode

If space RH is the active humidification mode, then the humidifier is available for unoccupied humidification. The unit will start and begin humidifying when the space RH is less than the unoccupied humidification setpoint.

C. Humidification disable

The humidification call remains active for a 10 minute delay after the humidity reading is above the setpoint plus the offset.

D. Humidification with cooling

Humidification will be allowed to run when the unit is in cooling mode when enabled.

E. Humidifier control

The humidifier controls directly to maintain the active humidification setpoint. If space RH or return RH is selected, the humidifier will be limited to the maximum allowed supply RH limit.

F. Warm up

During the initial call for humidification, the output can be set to hold a value for a period of time to allow the humidifier to warm up before being released to setpoint control.

14. PREHEAT

A preheat device can be installed in the unit to preheat outside air coming into the unit.

A. Availability

1) Modulating capacity

The following must occur to enable a modulating preheater:

- Preheat is not locked out; **and**
- The preheat sensor has a valid reading; **and**
- The outside air damper is greater than the enable position; **and**
- The system is on.

2) Fixed capacity

The following must occur to enable a fixed preheater:

- Preheat is not locked out; **and**
- The outside air sensor has a valid reading; **and**
- The outside air damper is greater than the enable position; **and**
- The system is on.

B. Preheat call

1) Modulating capacity

The preheat call occurs when the preheat temperature is less than the preheat setpoint.

2) Fixed capacity

The preheat call occurs when it is available.

15. COMPRESSOR STAGING

Compressors are staged to maintain the active temperature setpoint.

A. Modulating compressor

The modulating compressor is used to trim capacity between stages of fixed compressors.

B. Fixed compressors

Fixed compressors are staged on when more capacity is needed than the modulating compressor is capable of providing, and staged off when the modulating compressor is at its minimum speed.

C. Lead/lag sequencing

Compressors are staged based on the lead/lag mode selected:

1) Always lead

Compressors always stage based on the order selected for lead staging.

2) Always lag

Compressors always stage based on the order selected for lag staging.

3) With dehumidification

Compressors stage based on the lead staging order when **not** dehumidifying. When dehumidification is active, the compressors stage based on the lag staging order.

4) Weekly

If weekly is chosen, the lead lag order switches at midnight of the user-selected switching day.

D. Compressor failure

If a compressor becomes unavailable due to an alarm, that compressor will be replaced by the next available compressor specified in the sequence.

16. CHILLED WATER COIL

If a chilled water coil is installed, the chilled water valve modulates to maintain the active temperature setpoint when the unit is in cooling mode. The chilled water valve can optionally be held open to maintain flow when the unit is off.

17. HOT WATER COIL

If a hot water coil is installed, the hot water valve modulates to maintain the active temperature setpoint when the unit is in heating mode.

A. Case Heat

Case heat is available to keep the unit casing at a specific temperature using the hot water coil.

1) Availability

The following must be true to enable the case heat function:

- Unit is in off/standby mode; **and**
- The minimum of the cooling coil leaving air temperature or the mixed air temp is less than the case heat setpoint.

2) Hot water valve modulation

When case heat is enabled, the hot water valve modulates to maintain the case heat setpoint while the unit is in standby.

18. HOT GAS REHEAT

The hot gas reheat coil heats air to maintain supply air temperature by modulating a reheat valve when the unit is in dehumidification mode, or when single zone, variable air volume cooling mode with reset is active.

A. Purge

When hot gas reheat purge occurs the hot gas reheat valve opens to 100% and remains open for the duration of the purge delay. This function only occurs when the unit controller deems it necessary.

19. FURNACE STAGING

Furnaces are staged to maintain the supply temperature setpoint. Furnaces stage in a fixed order based on factory installation:

A. Modulating furnace

The modulating signal tracks the heating ramp of the controller.

B. Fixed stage furnace

The heating ramp of the controller stages furnaces as needed.

20. CIRCUIT PRESSURE CONTROL

Condenser fans or water valves modulate to maintain the saturated gas temperature setpoint.

A. Setpoints

The circuits can be controlled to three different setpoints: heating, cooling, and dehumidification.

B. Condenser fan staging

Condenser fans stage to maintain the active circuit pressure control setpoint.

1) Modulating fans

Modulating fans are ramped with the circuit pressure control ramp. If a unit has both modulating and fixed capacity fans, the modulating fan is used to trim capacity between stages of fixed fans.

2) Fixed fans

Fixed fans are staged on when more capacity is needed than the modulating fan is capable of providing and staged off when the modulating fan is at its minimum speed.

C. Water source heat pump head pressure control

Circuit pressure control in a water source heat pump consists of one or two water valves and a coaxial heat exchanger. The water valves modulate to maintain the active circuit pressure control setpoint in cooling, dehumidification, and heating modes.

21. COMPRESSOR ENVELOPE CONTROL

Compressor envelope control is available for all units but is dependent on hardware installed. The operating envelope is comprised of minimum and maximum evaporating and condensing temperatures that create an envelope of desired operating limits based on the compressor manufacturer's limitations.

A. Units without electronic expansion valves

If any of the following alarm conditions occur, the modulating capacity of the compressor is reduced or the fixed stage compressor is turned off. These alarm conditions can be disabled by disabling compressor envelope alarms.

1) High saturated discharge temperature

A high saturated discharge temperature alarm activates if the saturated discharge temperature rises above the alarm setpoint.

2) Low saturated suction temperature

A low saturated suction temperature alarm activates if the saturated suction temperature falls below the alarm setpoint for a delay.

3) High discharge line temperature

If the discharge line temperature rises above the alarm setpoint for the duration of the compressor protection delay, a high discharge line temperature alarm activates.

4) High superheat

If the superheat rises above the alarm setpoint for the duration of the compressor protection delay, a high superheat alarm activates.

5) High compression

Based on sliding pressure ranges and the difference between suction and discharge refrigerant pressures, if the difference rises above a calculated setpoint for the compressor protection delay, a high compression ratio alarm activates. This alarm remains active after the alarm condition clears for the duration of the envelope alarm lockout delay or until the alarm is manually reset.

6) High suction

If the suction pressure rises above the alarm setpoint for the duration of the envelope alarm protection delay, a high suction pressure alarm activates. This alarm remains active after the alarm condition clears for the duration of the envelope alarm lockout delay or until the alarm is manually reset.

7) Low condenser pressure

If the liquid pressure, or the discharge pressure minus an offset (if liquid pressure is not available), falls below the low condenser setpoint for the duration of the compressor protection delay, a low condenser pressure alarm activates. This alarm remains active after the alarm condition clears for the duration of the envelope alarm lockout delay or until the alarm is manually reset.

8) Abnormal pressure

If the discharge pressure minus the suction pressure is less than 30 psi for 240 seconds, an abnormal pressure alarm activates. This alarm remains active after the alarm condition clears for the duration of the envelope alarm lockout delay or until the alarm is manually reset.

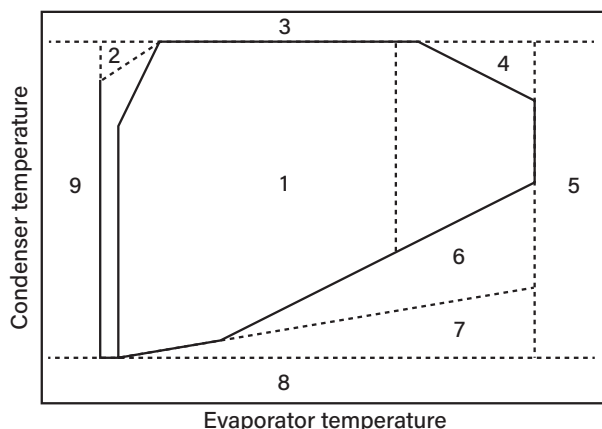
B. Units with electronic expansion valves

When an inverter scroll compressor is installed with an electronic expansion valve, the following compressor envelope logic applies:

1) Compressor envelope zones

As the compressor operation approaches a zone other than the normal operation (Zone 1), the controller modulates the inverter compressor's speed according to the compressor control algorithm to prevent the compressor from leaving Zone 1.

Figure 19: Compressor envelope example (see zone descriptions below)



If the compressor is outside Zone 1 for a period of time, an alarm activates corresponding to the following zones:

- Zone 2: high pressure ratio
- Zone 3: high discharge pressure
- Zone 4: high motor current
- Zone 5: high suction pressure
- Zone 6: low pressure ratio
- Zone 7: low delta ratio
- Zone 8: low discharge pressure
- Zone 9: low suction pressure

22. WATER SOURCE HEAT PUMP

A. Water valve

At a call for a compressor, the following occurs:

- The water source heat pump water valve for that circuit opens to 100%; **and**
- Notifies the BMS to start the pump via:
 - Hardwired output by closing the contact on the board; **and**
 - BMS-communicated point by enabling a pump request.
- The water source heat pump compressor delay timer starts; **and**
- Allows the compressor to start after the delay time has expired.

After the last compressor in the circuit turns off, the controller:

- Forces the water source heat pump water valve for that circuit to open 100% for 5 minutes; **and**
- Starts the water source heat pump compressor delay timer to delay notifying the BMS to turn the pump off; **and**
- Notifies the BMS to stop the pump via:
 - Hardwired output by opening the contact on the board; **and**
 - BMS-communicated point by disabling a pump request.

B. Entering water temperature alarms

The following alarms occur based on coaxial coil entering water temperatures:

- An entering water temperature alarm activates:
 - When cooling and entering water temperature is greater than setpoint; **or**
 - When heating and entering water temperature is less than setpoint.

The controller responds to an entering water temperature alarm:

- When heating, it displays a low entering water temp alarm.
- When cooling, it displays a high entering water temp alarm.
- An entering water temp alarm automatically resets:
 - When cooling and entering water temperature is less than setpoint; **or**
 - When heating and entering water temperature is greater than setpoint.

C. Coax coil defrost: heating

In heating mode, a water source heat pump may need to initiate a defrost cycle of the water coil to prevent a complete freeze.

1) Initialized

The saturated suction temperature determines when a defrost cycle occurs. The following conditions must be true:

- Saturated suction temperature is less than the fluid freeze temperature setpoint; **and**
- Cold weather start is not active; **and**
- The unit has controls enabled.

2) Termination

The defrost cycle terminates when:

- The active circuit's saturated suction temperature is greater than the cancel setpoint.

At defrost cycle termination, the unit reverts back to heating mode operation.

3) Water source heat pump heating lockout

Water source heat pump heating mode is unavailable when:

- The water source heat pump defrost cycle continues for more than the maximum defrost time; **or**
 - A defrost cycle is initiated three times in any one-hour period.
 - Each strike created by a defrost mode entry clears one hour after the strike occurs.

4) Water source heat pump heating lockout reset

The water source heat pump heating lockout resets when:

- The water source heat pump heating lockout occurred more than two hours prior; **and**
- The saturated suction temperature is greater than or equal to the cancel setpoint; **or**
 - If the maximum defrost time triggered the lockout, the outside air temperature is greater than the fluid freeze temp setpoint plus 10 °F.

D. Supply fan modulation

In heating mode, if the supply air temperature is less than 60 °F, the supply fan speed decreases to maintain 60 °F.

23. AIR SOURCE HEAT PUMP

A. Outside coil defrost

An air source heat pump periodically needs to initiate a defrost cycle of the outside coil to remove accumulated frost when operating in heating mode.

B. Defrost sequence

1) Initialized

The saturated suction temperature determines when a defrost cycle occurs. For a defrost cycle to initiate, one of the following must be true:

- The saturated suction temperature is less than setpoint; **or**
- The saturated suction temperature is less than a calculated setpoint based on ambient conditions.

At defrost cycle initiation, the following steps occur:

- The reversing valve switches to the cooling position; **and**
- Condenser fans turn off; **and**
- The hot gas reheat valve moves to the closed position; **and**
- Auxiliary heat is enabled.

2) Terminated

The defrost cycle terminates when:

- The saturated suction temperatures of all circuits are greater than or equal to the cancel setpoint; **or**
- The maximum allowed defrost time has been exceeded.

At defrost cycle termination, the unit reverts back to heating mode operation.

3) Auxiliary heat

Auxiliary heat is enabled with the following constraint: during auxiliary heat, the unit will use heating sources other than the heat pump in order to maintain the supply air temperature setpoint. The electric heat maximum output must meet the auxiliary heat maximum setpoint during defrost.

Note: Controls Lite notifies the third-party controller when auxiliary heat should be enabled.

4) Air source heat pump heating lockout

Air source heat pump heating mode is unavailable when:

- The air source heat pump defrost cycle continues for more than the maximum defrost time; **or**
- A defrost cycle is initiated three times in any one hour period.
 - Each strike created by a defrost mode entry clears one hour after the strike occurs.

5) Heating lockout reset

The air source heat pump heating lockout resets when:

- The air source heat pump heating lockout occurred more than one hour prior; **and**
 - The outside air temperature increases; **or**
 - The outside humidity decreases.

24. BMS WATCHDOG

The BMS watchdog function verifies BMS connectivity. The watchdog is required for the BMS to take the place of a hardwired sensor. The BMS toggles the watchdog variable from true to false within the timeout delay. If the timer expires, the controller falls back to hardwired sensors until the BMS connection can be established. At this time, a BMS watchdog alarm activates.

The following variables may be used by the BMS in place of hardwired sensors:

- Outside_RH_from_BMS
- Outside_Temp_from_BMS
- Return_RH_from_BMS
- Return_Temp_from_BMS
- Space_1_CO2_from_BMS
- Space_2_CO2_from_BMS
- Return_CO2_from_BMS
- Space_RH_from_BMS
- Space_Static_from_BMS
- Space_Temp_from_BMS

25. UNIT ALARMS

Refer to [Table 11: Alarms data](#) for a list of available alarms.

A. Global alarm output

The global alarm output is active via hardwired or BMS output. The output can be selected to energize based on any alarm condition or to shut down alarms only.

B. Alarm resetting methods

The following methods may be used to manually reset the alarms:

- Push the **Alarm** button twice on the handheld or virtual (web-based) keypad/display to access the alarm reset screen and press **Enter**; *or*
- From the **Alarms** menu go to **Reset Alarms**; *or*
- Reset all alarms via the BMS.

DATA TABLES

SETPOINTS DATA

The following tables are quick references for control variables, ranges, and defaults.

Note: not all variables are available on every unit.

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
TEMP CONTROL							
Reset Control Mode - Temperature Control Mode Selection	Space Reset	Supply Temp Control, Space Reset, Return Reset, Outside Reset		Space Reset	Supply Temp Control, Space Reset, Return Reset, Outside Reset		
Temperature Setpoint	72.0°F	0.0°F	300.0°F	72.0°F	50.0°F	100.0°F	
Heat Cool Deadband	4.0 Δ°F	0.0 Δ°F	20.0 Δ°F	4.0 Δ°F	0.0 Δ°F	20.0 Δ°F	
Supply Setpoints - Cooling Mode							
Maximum	100.0°F	0.0°F	300.0°F	100.0°F	70.0°F	100.0°F	
Minimum	50.0°F	0.0°F	300.0°F	50.0°F	50.0°F	70.0°F	
Supply Setpoints - Heating Mode							
Maximum	100.0°F	0.0°F	300.0°F	100.0°F	70.0°F	100.0°F	
Minimum	50.0°F	0.0°F	300.0°F	55.0°F	50.0°F	70.0°F	
Outside Setpoints - Outside Reset							
Maximum	80.0°F	-30.0°F	130.0°F	80.0°F	-30.0°F	130.0°F	
Minimum	30.0°F	-30.0°F	130.0°F	30.0°F	-30.0°F	130.0°F	
Mode Switch Delay	120 sec	0 sec	600 sec	120 sec	30 sec	600 sec	
Startup Delay	30 sec	0 sec	600 sec	30 sec	0 sec	600 sec	
Cooling Amb Lockout	55.0°F	30.0°F	100.0°F	55.0°F	30.0°F	100.0°F	
PreCooling Amb Lockout	55.0°F	30.0°F	100.0°F	--	--	--	
Heating Amb Lockout	80.0°F	30.0°F	100.0°F	80.0°F	30.0°F	100.0°F	
PreHeat							
Amb Lockout	60.0°F	0.0°F	100.0°F	10.0°F	-40.0°F	65.0°F	
OAD En Pos	0%	0%	100%	30%	0%	100%	
Setpoint	70.0°F	0.0°F	100.0°F	--	--	--	
Unoccupied Cooling							
Setpoint	80.0°F	0.0°F	300.0°F	80.0°F	65.0°F	85.0°F	
Hysteresis	5.0 Δ°F	0.0 Δ°F	10.0 Δ°F	5.0 Δ°F	0.0 Δ°F	10.0 Δ°F	
Unoccupied Heating							
Setpoint	60.0°F	0.0°F	300.0°F	60.0°F	50.0°F	70.0°F	
Hysteresis	5.0 Δ°F	0.0 Δ°F	10.0 Δ°F	5.0 Δ°F	0.0 Δ°F	10.0 Δ°F	
Winter Ramp							
Enable	Disabled (☐)	Disabled (☐)	Enabled (☒)	Disabled (☐)	Disabled (☐)	Enabled (☒)	
Mode	Outside Damper	Supply Fan	Outside Damper	Supply Fan	Supply Fan	Outside Damper	
OAT Enable	40.0°F	20.0°F	70.0°F	40.0°F	20.0°F	70.0°F	
Case Heat Setpoint	40.0°F	0.0°F	100.0°F	40.0°F	0.0°F	100.0°F	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Regeneration							
Wheel Inlet Min	60.0°F	0.0°F	400.0°F	--	--	--	
Wheel Inlet Max	130.0°F	0.0°F	400.0°F	--	--	--	
Regen Supply DewPt							
Reset Range Min	37.0°F	0.0°F	100.0°F	--	--	--	
Reset Range Max	41.0°F	0.0°F	100.0°F	--	--	--	
DEHUMIDIFICATION							
Dehumidification Mode							
Inside RH >	60%	0%	100%	60%	0%	100%	
Inside Dewpt >	60.0°F	0.0°F	90.0°F	60.0°F	0.0°F	90.0°F	
Outside Dewpt >	60.0°F	0.0°F	100.0°F	60.0°F	0.0°F	100.0°F	
Unoccupied Dehumidification Mode							
Inside RH >	5%	0%	100%	5%	0%	100%	
Unoccu Inside Dewpt >	70.0°F	0.0°F	90.0°F	70.0°F	0.0°F	90.0°F	
Dehumidification Hysteresis							
Humidity	4%	0%	10%	4%	0%	10%	
Dewpoint	2.0 Δ°F	0.0 Δ°F	10.0 Δ°F	2.0 Δ°F	0.0 Δ°F	10.0 Δ°F	
Desiccant Wheel Speed	25%	0%	100%	--	--	--	
On Delay	2 min	0 min	99 min	--	--	--	
Minimum On Time	15 min	0 min	99 min	--	--	--	
Cold Coil Setpoint	55.0°F	35.0°F	80.0°F	55.0°F	46.0°F	80.0°F	
Priority Selection							
Dehum→Temp	Disabled (□)	Disabled (□)	Enabled (☒)	Disabled (□)	Disabled (□)	Enabled (☒)	Disabled = Dehumidification Priority; Enabled = Temperature Priority
Heat→Dehum	Enabled (□)	Disabled (□)	Enabled (☒)	Enabled (□)	Disabled (□)	Enabled (☒)	Disabled = Heating Priority; Enabled = Dehumidification Priority
Overcool Coil Offset	0.0 Δ°F	0.0 Δ°F	10.0 Δ°F	0.0 Δ°F	0.0 Δ°F	10.0 Δ°F	
Dehum Force Comp On							
Clg Ramp 1	Enabled (☒)	Disabled (□)	Enabled (☒)	Enabled (☒)	Disabled (□)	Enabled (☒)	
Clg Ramp 2	Disabled (□)	Disabled (□)	Enabled (☒)	--	--	--	
Clg Ramp 3	Disabled (□)	Disabled (□)	Enabled (☒)	--	--	--	
Clg Ramp 4	Disabled (□)	Disabled (□)	Enabled (☒)	--	--	--	
Pool Unit Dewpoint							
Setpoint	66.0°F	20.0°F	80.0°F	--	--	--	
Source	Space Dewpt	Space Dewpt	Return Dewpt	--	--	--	
HUMIDIFICATION							
Mode Switch Delay	60 sec	0 sec	600 sec	--	--	--	
Humidification Control Source	Supply RH	Supply RH, Space RH, Return RH		--	--	--	
Humidification Setpoint	30%	0%	100%	--	--	--	
Humidification Hysteresis	5%	0%	20%	--	--	--	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Warmup Setpoint	10%	0%	100%	--	--	--	
Warmup Duration	300 sec	0 sec	600 sec	--	--	--	
Supply RH High Limit Setpoint	80%	0%	100%	--	--	--	
Unoccupied Humidify Setpoint	20%	0%	100%	--	--	--	
Humidification Amb Lockout	65.0°F	40.0°F	100.0°F	--	--	--	
REFRIGERATION							
Compressor Control							
Add Deadband	0.5 Δ°F	0.0 Δ°F	20.0 Δ°F	0.5 Δ°F	0.0 Δ°F	20.0 Δ°F	
Sub Deadband	0.5 Δ°F	0.0 Δ°F	20.0 Δ°F	0.5 Δ°F	0.0 Δ°F	20.0 Δ°F	
Cooling Delays							
Interstage	60 sec	10 sec	600 sec	60 sec	10 sec	600 sec	
Subtract	60 sec	10 sec	600 sec	60 sec	10 sec	600 sec	
Heating Delays							
Interstage	60 sec	10 sec	600 sec	60 sec	10 sec	600 sec	
Subtract	60 sec	10 sec	600 sec	60 sec	10 sec	600 sec	
Re-Add Delay	300 sec	10 sec	600 sec	300 sec	10 sec	600 sec	
Min On	60 sec	1 sec	600 sec	60 sec	1 sec	600 sec	
Min Off	270 sec	1 sec	600 sec	270 sec	1 sec	600 sec	
Cold Coil Low Limit Setpoint	42.0°F	35.0°F	55.0°F	42.0°F	35.0°F	55.0°F	
Coil Staging Safety Setpoint	46.0°F	35.0°F	55.0°F	46.0°F	35.0°F	55.0°F	
Pressure Control							
Pressure Control							
Condenser Type	Condenser Fan Ctrl	Condenser Fan Ctrl	Water Valve Ctrl	Condenser Fan Ctrl	Condenser Fan Ctrl	Water Valve Ctrl	
Cooling	105.0°F	80.0°F	140.0°F	105.0°F	80.0°F	140.0°F	
Dehumidifying	105.0°F	80.0°F	140.0°F	115.0°F	80.0°F	140.0°F	
Offset	--	--	--	5.0 Δ°F	1.0 Δ°F	20.0 Δ°F	AHPC 1.0
Heating	50.0°F	40.0°F	60.0°F	50.0°F	40.0°F	60.0°F	
Offset	--	--	--	2.0 Δ°F	1.0 Δ°F	10.0 Δ°F	AHPC 1.0
Pressure Control - Water Valve							
Clg Min Position	20%	0%	100%	20%	0%	100%	WSHP
Htg Min Position	20%	0%	100%	20%	0%	100%	WSHP
Off Position	100%	0%	100%	100%	0%	100%	WSHP
Condenser Fan Minimum Speed	25%	0%	100%	25%	0%	100%	
Heat Pump Control							
WSHP Cold Start							
OAT Enable	30.0°F	0.0°F	60.0°F	30.0°F	0.0°F	60.0°F	
Duration	60 sec	0 sec	600 sec	60 sec	0 sec	600 sec	
WSHP Fluid Freeze Setpoint	--	--	--	32.0°F	0.0°F	32.0°F	
ASHP Low Ambient Lockout	--	--	--	17.0°F	10.0°F	50.0°F	
WSHP Low Saturated Suction Lockout	-15.0°F	-30.0°F	0.0°F	-15.0°F	-30.0°F	0.0°F	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Heat Pump Defrost							
WSHP Cancel Setpt	--	--	--	95.0°F	55.0°F	110.0°F	
ASHP Cancel Setpt	--	--	--	60.0°F	55.0°F	80.0°F	
Max Time	--	--	--	10 min	5 min	20 min	
MULTIZONE CTRL							
Enable Hot Deck Setpoint Reset	Disabled (☐)	Disabled (☐)	Enabled (☒)	--	--	--	
Enable Cold Deck Setpoint Reset	Disabled (☐)	Disabled (☐)	Enabled (☒)	--	--	--	
Hot Deck Spt	80.0°F	0.0°F	300.0°F	--	--	--	
Cold Deck Spt	55.0°F	0.0°F	300.0°F	--	--	--	
Cold Deck Demand Enable	10%	0%	100%	--	--	--	
Hot Deck Demand Enable	10%	0%	100%	--	--	--	
Unoccupied Heating Zones	4	0	16	--	--	--	
Unoccupied Cooling Zones	4	0	16	--	--	--	
EVAP COOLING							
Sump Auto Drain							
Enable	Disabled (☐)	Disabled (☐)	Enabled (☒)	--	--	--	
Daily/Weekly	Weekly (☒)	Daily (☐)	Weekly (☒)	--	--	--	
Drain on	Monday	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday		--	--	--	Shows when Weekly is selected
Drain @ Hour	00	00	23	--	--	--	
Drain @ Minute	00	00	59	--	--	--	
DAMPER CONTROL							
Fan Damper Delay	30 sec	0 sec	300 sec	30 sec	0 sec	300 sec	
Outside Damper							
Minimum	0%	0%	100%	0%	0%	100%	
CO2 Minimum	20%	0%	100%	20%	0%	100%	
Maximum	100%	0%	100%	100%	0%	100%	
Exhaust Damper							
Minimum	0%	0%	100%	--	--	--	
Maximum	100%	0%	100%	--	--	--	
Return Damper							
Minimum	0%	0%	100%	--	--	--	
Maximum	100%	0%	100%	--	--	--	
Recirc Damper							
Minimum	0%	0%	100%	--	--	--	
Maximum	100%	0%	100%	--	--	--	
Outside Damper Airflow Setpoint	0 CFM	0 CFM	999999 CFM	0 CFM	0 CFM	999999 CFM	
Min Outside Damper							
Minimum	0%	0%	100%	--	--	--	
Maximum	100%	0%	100%	--	--	--	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Min Outside Damper Airflow Setpoint	1000 CFM	0 CFM	999999 CFM	--	--	--	
Pool OAD Winter Limit	10%	0%	100%	--	--	--	
Economizer Mode Selected	Outside Dry Bulb	Disabled, Outside Dry Bulb, Outside Enthalpy, Comparative Dry Bulb, Comparative Enthalpy		Outside Dry Bulb	Disabled, Outside Dry Bulb, Outside Enthalpy, Comparative Dry Bulb, Comparative Enthalpy		
Economizer Settings							
Outside Dry Bulb Setpoint	65°F	50.0°F	90.0°F	65°F	50.0°F	90.0°F	
Outside Enthalpy Setpoint	23 btu/lb	15 btu/lb	40 btu/lb	23 btu/lb	15 btu/lb	40 btu/lb	
Hysteresis							
Temperature	2.0 Δ°F	0.0 Δ°F	10.0 Δ°F	2.0 Δ°F	0.0 Δ°F	10.0 Δ°F	
Enthalpy	2.0 btu/lb	0.0 btu/lb	10.0 btu/lb	2.0 btu/lb	0.0 btu/lb	10.0 btu/lb	
Energy Recovery Reduction Only	Disabled (□)	Disabled (□)	Enabled (☒)	--	--	--	
Space CO2 Setpoint	700 ppm	0 ppm	5000 ppm	700 ppm	0 ppm	5000 ppm	
Pool Purge Mode							
Trigger Purge	No	No	Innovent	--	--	--	
Cancel Purge	No	No	Innovent	--	--	--	
Purge Duration	240 min	5 min	960 min	--	--	--	
ENERGY RECOVERY							
Defrost Ramp Exhaust Setpt	36.0°F	15.0°F	50.0°F	36.0°F	15.0°F	50.0°F	
Heat Wheel							
Supply Bypass Setpoint	2.00 "wc	0.00 "wc	5.00 "wc	--	--	--	
Exhaust Bypass Setpoint	2.00 "wc	0.00 "wc	5.00 "wc	--	--	--	
Minimum Speed	20%	0%	100%	20%	0%	100%	
Enable Jog	Enabled (☒)	Disabled (□)	Enabled (☒)	Enabled (☒)	Disabled (□)	Enabled (☒)	
Jog Enable Delay	60 min	10 min	300 min	60 min	10 min	300 min	
Jog Duration	2 min	1 min	99 min	2 min	1 min	99 min	
FAN CONTROL							
Supply Fan Control							
Enable Delay	5 sec	0 sec	60 sec	5 sec	0 sec	60 sec	
Minimum Speed	50%	0%	100%	50%	50%	100%	
Maximum Speed	100%	0%	100%	100%	50%	100%	
Constant Volume Setpt							
Occupied	100%	0%	100%	100%	50%	100%	
Unoccupied	60%	0%	100%	60%	50%	100%	
Duct Static Setpoint	1.00 "wc	0.00 "wc	5.00 "wc	1.00 "wc	0.00 "wc	5.00 "wc	
Space Static Setpoint	-0.04 "wc	-0.50 "wc	0.50 "wc	0.05 "wc	-0.50 "wc	0.50 "wc	
Airflow Setpoint	0 CFM	0 CFM	999999 CFM	0 CFM	0 CFM	999999 CFM	
Soft Shutdown Enable							
Setpoint	85.0°F	70.0°F	150.0°F	85.0°F	70.0°F	150.0°F	
Delay	120 sec	0 sec	999 sec	120 sec	0 sec	999 sec	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Exhaust Fan Control							
Constant Volume Setpt							
Enable Delay	0 sec	0 sec	60 sec	0 sec	0 sec	60 sec	
Enable when OAD >=	0%	0%	99%	15%	0%	99%	
Minimum Speed	25%	0%	100%	25%	25%	100%	
Maximum Speed	100%	0%	100%	100%	25%	100%	
Constant Volume Setpt							
Occupied	100%	0%	100%	100%	25%	100%	
Unoccupied	60%	0%	100%	60%	25%	100%	
Space Static Setpoint	-0.04 "wc	-0.50 "wc	0.50 "wc	0.05 "wc	-0.50 "wc	0.50 "wc	
Supply Tracking Offset	10%	-100%	100%	-10%	-100%	100%	
Airflow Setpoint	0 CFM	0 CFM	999999 CFM	0 CFM	0 CFM	999999 CFM	
Exh Space Pressure - OAD Control Deviation							
Normal	20%	0%	100%	--	--	--	
Winter	80%	0%	100%	--	--	--	
Return Duct Static Setpoint	-2.00 "wc	0.00 "wc	-5.00 "wc	--	--	--	
Return Fan Control							
Enable Delay	10 sec	0 sec	60 sec	--	--	--	
Minimum Speed	50%	0%	100%	--	--	--	
Maximum Speed	100%	0%	100%	--	--	--	
Constant Volume Setpt							
Occupied	100%	0%	100%	--	--	--	
Unoccupied	60%	0%	100%	--	--	--	
Return Duct Static Setpoint	-2.00 "wc	0.00 "wc	-5.00 "wc	--	--	--	
Supply Fan Tracking Offset	10%	-100%	100%	--	--	--	
Airflow Setpoint	10000 CFM	0 CFM	999999 CFM	--	--	--	
Space Static Setpoint	-0.04 "wc	-0.50 "wc	0.50 "wc	--	--	--	
Supply Tracking Offset	10%	-100%	100%	--	--	--	
Scavenger Fan Control							
Enable Delay	0 sec	0 sec	60 sec	--	--	--	
Minimum Speed	25%	0%	100%	--	--	--	
Maximum Speed	100%	0%	100%	--	--	--	
Constant Volume Setpt							
Occupied	100%	0%	100%	--	--	--	
Unoccupied	60%	0%	100%	--	--	--	
Regeneration Fan Control							
Enable Delay	0 sec	0 sec	60 sec	--	--	--	
Minimum Speed	50%	0%	100%	--	--	--	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Maximum Speed	100%	0%	100%	--	--	--	
Occupied	100%	0%	100%	--	--	--	
Unoccupied	60%	0%	100%	--	--	--	
OCCUPANCY							
Occupancy Mode	BMS	BMS, Digital Input, Schedule, Always Occ, Always Unocc		BMS	BMS, Digital Input, Schedule, Always Occ, Always Unocc		
BMS Comm Loss Occupancy Fallback Mode	BMS Last Known	BMS Last Known, Digital Input, Schedule, Occupied, Unoccupied		BMS Last Known	BMS Last Known, Digital Input, Schedule, Occupied, Unoccupied		
Occupancy Schedule Day	Monday	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday		Monday	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday		All days on one screen Choose the day to change then the operation and start/stop times
Mode	Occupied	Occupied, Unoccupied, Schedule		Occupied	Occupied, Unoccupied, Schedule		
Start Time: 00:00	06:00 AM	12:00 AM	11:59 PM	06:00 AM	12:00 AM	11:59 PM	
Stop Time: 00:00	06:00 PM	12:00 AM	11:59 PM	06:00 PM	12:00 AM	11:59 PM	
Occ Timed Override							
Enable	Disabled (☐)	Disabled (☐)	Enabled (☑)	Disabled (☐)	Disabled (☐)	Enabled (☑)	
Duration	60 min	0 min	240 min	60 min	0 min	240 min	
Occupied Auto Mode							
Enable	Disabled (☐)	Disabled (☐)	Enabled (☑)	Disabled (☐)	Disabled (☐)	Enabled (☑)	
Deadband	4.0 Δ°F	0.1 Δ°F	20.0 Δ°F	4.0 Δ°F	0.1 Δ°F	20.0 Δ°F	
Unoccupied Start Enable Modes							
Cooling	Disabled (☐)	Disabled (☐)	Enabled (☑)	Enabled (☑)	Disabled (☐)	Enabled (☑)	
Heating	Disabled (☐)	Disabled (☐)	Enabled (☑)	Enabled (☑)	Disabled (☐)	Enabled (☑)	
Dehumidification	Disabled (☐)	Disabled (☐)	Enabled (☑)	Enabled (☑)	Disabled (☐)	Enabled (☑)	
Humidification	Disabled (☐)	Disabled (☐)	Enabled (☑)	--	--	--	
ADVANCED							
Login							
Enter Password	0000	0000	9999	0000	0000	9999	
Current Access Level	Read Only	Read Only, Service Level, Factory Level		Read Only	Read Only, Service Level, Factory Level		
Manual Overrides							
Manual Override Mode							
Enable	Disabled (☐)	Disabled (☐)	Enabled (☑)	Disabled (☑)	Disabled (☐)	Enabled (☑)	
Duration	480 min	0 min	480 min	480 min	0 min	480 min	
Occupancy							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Value	Current Operation	Unoccupied	Occupied	Current Operation	Unoccupied	Occupied	
Supply Fan (1-4)							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Command (1-4)	Current Command	Off	On	Current Command	Off	On	
Speed	Current Speed	0%	100%	Current Speed	0%	100%	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Exhaust Fan (1-4)							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Command (1-4)	Current Command	Off	On	Current Command	Off	On	
Speed	Current Speed	0%	100%	Current Speed	0%	100%	
Return Fan (1-4)							
Override	Auto	Auto	Manual	--	--	--	
Command (1-4)	Current Command	Off	On	--	--	--	
Speed	Current Speed	0%	100%	--	--	--	
Scavenger Fan (1-4)							
Override	Auto	Auto	Manual	--	--	--	
Command (1-4)	Current Command	Off	On	--	--	--	
Speed	Current Speed	0%	100%	--	--	--	
Regeneration Fan							
Override	Auto	Auto	Manual	--	--	--	
Command	Current Command	Off	On	--	--	--	
Speed	Current Speed	0%	100%	--	--	--	
Outside Damper							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Position	Current Speed	0%	100%	Current Speed	0%	100%	
Min Outside Damper							
Override	Auto	Auto	Manual	--	--	--	
Position	Current Position	0%	100%	--	--	--	
Return Damper							
Override	Auto	Auto	Manual	--	--	--	
Position	Current Position	0%	100%	--	--	--	
Recirc Damper							
Override	Auto	Auto	Manual	--	--	--	
Position	Current Position	0%	100%	--	--	--	
Exhaust Damper							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Position	Current Position	0%	100%	Current Position	0%	100%	
Compressor Request							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Comp #: (1-8)	Current Request	Off	On	Current Request	Off	On	
Compressor Signal							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Comp #: (1-8)	Current Signal	0%	100%	Current Signal	0%	100%	
Cooling Ramp 1-4							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Demand	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Furnace Request							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Furnace Stage (F1-8 S1-2)	Current State	Off	On	Current State	Off	On	
Electric Heat							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Elec Heater #: (1-2)	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Heating Ramp							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Demand	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Heat Pump Heating Ramp							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Demand	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Economizer Ramp							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Value	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Humidification Ramp							
Override	Auto	Auto	Manual	--	--	--	
Value	Current Ramp %	0%	100%	--	--	--	
Preheat Ramp							
Override	Auto	Auto	Manual	--	--	--	
Value	Current Ramp %	0%	100%	--	--	--	
Hot Gas Reheat Ramp							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Value	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Defrost Ramp							
Override	Auto	Auto	Manual	Auto	Auto	Manual	Reduces Energy Recovery - 100%= Full Bypass/Min Speed
Value	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Energy Recovery Ramp							
Override	Auto	Auto	Manual	Auto	Auto	Manual	
Value	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Regen Heating Ramp							
Override	Auto	Auto	Manual	--	--	--	
Value	Current Ramp %	0%	100%	--	--	--	
Multizone Dampers (1-12)							
Override	Auto	Auto	Manual	--	--	--	
Zone #: (1-12)	Current Ramp %	0%	100%	--	--	--	
Pressure Control							
Override	Auto	Auto	Manual	Auto	Auto	Manual	Compressor Operation must be off to override Pressure Control
Ramp #: (1-8)	Current Ramp %	0%	100%	Current Ramp %	0%	100%	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Pressure Control							
Override	--	--	--	Auto	Auto	Manual	Compressor Operation must be off to override Pressure Control
AHPC VFD %	--	--	--	Current Ramp %	0%	100%	
Fixed Stage #: (2-4)	--	--	--	Current State	Off	On	
Pool OA Dewpoint Ramp							
Override	Auto	Auto	Manual	--	--	--	
Speed	Current Ramp %	0%	100%	--	--	--	
Adv. Setpoints							
Temp Reset PID Tuning							
P Gain	6.000	0.001	999.999	6.000	0.001	999.999	
I Time	300 sec	0 sec	1800 sec	300 sec	0 sec	1800 sec	
Cycle Time	30 sec	0 sec	100 sec	30 sec	0 sec	100 sec	
Cooling/HP PID Tuning							
P Gain	3.000	0.001	999.999	3.000	0.001	999.999	
I Time	60 sec	0 sec	1800 sec	60 sec	0 sec	1800 sec	
Cycle Time	1 sec	0 sec	100 sec	1 sec	0 sec	100 sec	
Deadband	0.0	0.0	10.0	0.0	0.0	10.0	
Heating PID Tuning							
P Gain	3.000	0.001	999.999	3.000	0.001	999.999	
I Time	150 sec	0 sec	1800 sec	150 sec	0 sec	1800 sec	
Cycle Time	1 sec	0 sec	100 sec	1 sec	0 sec	100 sec	
Deadband	0.0	0.0	10.0	0.0	0.0	10.0	
Supply Duct Static PID							
P Gain	4.000	0.001	999.999	4.000	0.001	999.999	
I Time	30 sec	0 sec	1800 sec	30 sec	0 sec	1800 sec	
Supply Space Static PI							
P Gain	100.000	0.001	999.999	100.000	0.001	999.999	
I Time	30 sec	0 sec	1800 sec	30 sec	0 sec	1800 sec	
Return Static PID							
P Gain	0.500	0.001	999.999	0.500	0.001	999.999	
I Time	60 sec	0 sec	1800 sec	60 sec	0 sec	1800 sec	
Winter Ramp PID Tuning							
P Gain	1.000	0.001	999.999	1.000	0.001	999.999	
I Time	200 sec	0 sec	1800 sec	200 sec	0 sec	1800 sec	
Cycle Time	1 sec	0 sec	100 sec	1 sec	0 sec	100 sec	
Deadband	1.0°F	0.0°F	50.0°F	1.0°F	0.0°F	50.0°F	
OAD Airflow Ramp							
P Gain	0.015	0.001	999.999	0.015	0.001	999.999	
I Time	30 sec	0 sec	1800 sec	30 sec	0 sec	1800 sec	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Min OAD Airflow Ramp							
P Gain	0.020	0.001	999.999	0.020	0.001	999.999	
I Time	250 sec	0 sec	1800 sec	250 sec	0 sec	1800 sec	
Humidification							
P Gain	2.000	0.001	999.999	--	--	--	
I Time	120 sec	0 sec	1800 sec	--	--	--	
Heat Wheel Bypass							
P Gain	2.000	0.001	999.999	2.000	0.001	999.999	
I Time	60 sec	0 sec	1800 sec	60 sec	0 sec	1800 sec	
Circuit Pressure							
P Gain	1.800	0.001	999.999	1.800	0.001	999.999	
I Time	20 sec	0 sec	1800 sec	20 sec	0 sec	1800 sec	
Economizer							
P Gain	2.000	0.001	999.999	2.000	0.001	999.999	
I Time	300 sec	0 sec	1800 sec	300 sec	0 sec	1800 sec	
Economizer Disable Fallback	Disabled (☐)	Disabled (☐)	Enabled (☒)	Disabled (☐)	Disabled (☐)	Enabled (☒)	
Hot Gas Reheat							
P Gain	10.000	0.001	999.999	10.000	0.001	999.999	
I Time	150 sec	0 sec	1800 sec	150 sec	0 sec	1800 sec	
PreHeat							
P Gain	4.000	0.001	999.999	--	--	--	
I Time	200 sec	0 sec	1800 sec	--	--	--	
CO2 Control							
P Gain	4.000	0.001	999.999	4.000	0.001	999.999	
I Time	600 sec	0 sec	1800 sec	600 sec	0 sec	1800 sec	
Supply Fan Airflow							
P Gain	0.006	0.001	999.999	0.006	0.001	999.999	
I Time	40 sec	0 sec	1800 sec	40 sec	0 sec	1800 sec	
Return Fan Airflow							
P Gain	0.006	0.001	999.999	--	--	--	
I Time	40 sec	0 sec	1800 sec	--	--	--	
Exhaust Fan Airflow							
P Gain	0.006	0.001	999.999	0.006	0.001	999.999	
I Time	40 sec	0 sec	1800 sec	40 sec	0 sec	1800 sec	
Multizone Damper							
P Gain	4.000	0.001	999.999	--	--	--	
I Time	300 sec	0 sec	1800 sec	--	--	--	
Cycle Time	10 sec	0 sec	100 sec	--	--	--	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Pool OA Dewpoint							
P Gain	2.000	0.001	999.999	--	--	--	
I Time	300 sec	0 sec	1800 sec	--	--	--	
Cycle Time	5 sec	0 sec	100 sec	--	--	--	
Supply Dewpoint Reset							
P Gain	1.000	0.001	999.999	--	--	--	
I Time	800 sec	0 sec	1800 sec	--	--	--	
Cycle Time	1 sec	0 sec	999 sec	--	--	--	
Regen Furnace Reset							
P Gain	3.000	0.001	999.999	--	--	--	
I Time	250 sec	0 sec	1800 sec	--	--	--	
Cycle Time	10 sec	0 sec	100 sec	--	--	--	
Regen Heat Turning							
P Gain	4.000	0.001	999.999	--	--	--	
I Time	350 sec	0 sec	1800 sec	--	--	--	
Cycle Time	5 sec	0 sec	100 sec	--	--	--	
Regen Post Heat Purge Duration	300 sec	0 sec	600 sec	--	--	--	
Regen Wheel Standby							
Mode	Jog	Jog, Keep On, Standby		--	--	--	
Jog On Time	450 sec	0 sec	1800 sec	--	--	--	
Jog Off Time	60 min	0 min	480 min	--	--	--	
HGRH Purge Mode							
Purge Interval	60 min	30 min	480 min	60 min	30 min	480 min	
Purge Duration	120 sec	45 sec	300 sec	120 sec	45 sec	300 sec	
Login Duration	30 min	5 min	60 min	30 min	5 min	60 min	
Chilled Water Valve Position	Closed	Closed	Open	Closed	Closed	Open	
Modulating Compressor Minimum Signal							
Cooling	12%	12%	100%	12%	12%	100%	
Dehumidify	12%	Cooling Min	100%	50%	Cooling Min	100%	
Comp Signal Ramp Rate	30 sec	1 sec	100 sec	30 sec	1 sec	100 sec	
Password Management - Service Password	9998	0001	9999	9998	0001	9999	
WSHP Freeze Protection	0.0°F	32.0°F	32.0°F	0.0°F	32.0°F	32.0°F	
WSHP Compressor Delay	60 sec	30 sec	120 sec	60 sec	30 sec	120 sec	
Network Settings							
pCO Board Address							
Enable DHCP	Disabled (☐)	Disabled (☐)	Enabled (☑)	Disabled (☐)	Disabled (☐)	Enabled (☑)	
IP	192.168.1.101	0.0.0.0	255.255.255.255	192.168.1.101	0.0.0.0	255.255.255.255	
Mask	255.255.255.0	255.0.0.0	255.255.255.0	255.255.255.0	255.0.0.0	255.255.255.0	
GW	192.168.1.1	0.0.0.0	255.255.255.255	192.168.1.1	0.0.0.0	255.255.255.255	
DNS	0.0.0.0	0.0.0.0	255.255.255.255	0.0.0.0	0.0.0.0	255.255.255.255	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Network Configuration - Expansion IP Address							
Exp 1	002	000	255	--	--	--	
Exp 2	003	000	255	--	--	--	
Exp 3	004	000	255	--	--	--	
Exp 4	005	000	255	--	--	--	
Exp 5	006	000	255	--	--	--	
Exp 6	007	000	255	--	--	--	
Master Slave Config							
Unit is	Master	Master	Slave	--	--	--	
Number of Slaves	0 Units	0 Units	4 Units	--	--	--	
Unit 1 (IP Address)	192.168.1.102	0.0.0.0	255.255.255.255	--	--	--	
Unit 2 (IP Address)	192.168.1.103	0.0.0.0	255.255.255.255	--	--	--	
Unit 3 (IP Address)	192.168.1.104	0.0.0.0	255.255.255.255	--	--	--	
Unit 4 (IP Address)	192.168.1.105	0.0.0.0	255.255.255.255	--	--	--	
BMS Communications Type	None	None, BACnet IP BMS Card, BACnet MSTP BMS Card, Lonworks BMS Card, Modbus TCP BMS Card, Modbus RTU BMS Card, BACnet MSTP J25 BMS2, Modbus RTU J25 BMS2, BACnet IP Ethernet, Fieldserver J25 BMS2, Modbus TCP Ethernet		None	None, BACnet IP BMS Card, BACnet MSTP BMS Card, Lonworks BMS Card, Modbus TCP BMS Card, Modbus RTU BMS Card, BACnet MSTP J25 BMS2, Modbus RTU J25 BMS2, BACnet IP Ethernet, Fieldserver J25 BMS2, Modbus TCP Ethernet		
pCO Web Config (BMS Card)	pCO WEB Card Installed						
Device	77077	1	4194302	--	--	--	
IP	192.168.1.101	0.0.0.0	255.255.255.255	--	--	--	
Mask	255.255.255.0	255.0.0.0	255.255.255.0	--	--	--	
GW	0.0.0.0	0.0.0.0	255.255.255.255	--	--	--	
DNS 1	0.0.0.0	0.0.0.0	255.255.255.255	--	--	--	
DNS 2	0.0.0.0	0.0.0.0	255.255.255.255	--	--	--	
pCONet BACnet Config (BMS Card)	pCONet Card Installed						
Device	77077	1	4194302	--	--	--	
Info Frames	20	1	127	--	--	--	
Max Masters	127	1	127	--	--	--	
MSTP Address	77	0	126	--	--	--	
Baud Rate	38400	9600, 19200, 38400, 76800		--	--	--	
Modbus RTU Config (BMS Card)	pCONet Card Installed						
Address	1	1	277	--	--	--	
Baud Rate	9600	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		--	--	--	
Stop Bits	1	1	2	--	--	--	
Parity	none	none, odd, even		--	--	--	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
BACnet MSTP Config (J25 BMS2)	Onboard BACnet MSTP						
Device	77077	1	4194302	77077	1	4194302	
Info Frames	20	1	127	20	1	127	
Max Masters	127	1	127	127	1	127	
MSTP Address	77	0	126	77	0	126	
Baud Rate	76800	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		76800	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		
Modbus RTU Config (J25 BMS2)	Onboard Modbus RS485						
Address	1	1	277	1	1	277	
Baud Rate	76800	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		76800	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		
Stop Bits	2	1	2	2	1	2	
Parity	none	none, odd, even		none	none, odd, even		
BACnet IP Config (Ethernet)	Onboard BACnet TCP/IP						
Device	77077	1	4194302	77077	1	4194302	
UDP Port	47808	0	65535	47808	0	65535	
Modbus TCP Slave (Ethernet)	Onboard Modbus TCP/IP						
Device ID	1	1	277	1	1	277	
BMS Watchdog							
Enable	Disabled (☐)	Disabled (☐)	Enabled (☑)	Disabled (☐)	Disabled (☐)	Enabled (☑)	
Timeout Delay	15 min	1 min	99 min	15 min	1 min	99 min	
BACnet COV Increment							
PPM	10.0 ppm	0.0 ppm	100.0 ppm	10.0 ppm	0.0 ppm	100.0 ppm	
Pressure	5.0 psig	0.0 psig	10.0 psig	5.0 psig	0.0 psig	10.0 psig	
Static	0.001" wc	0.0" wc	1.0" wc	0.001" wc	0.0" wc	1.0" wc	
Temp	0.1 Δ°F	0.0 Δ°F	2.0 Δ°F	0.1 Δ°F	0.0 Δ°F	2.0 Δ°F	
Airflow	100 cfm	0 cfm	100 cfm	100 cfm	0 cfm	100 cfm	
Enthalpy	0.5 btu/hr	0.0 btu/hr	2.0 btu/hr	0.5 btu/hr	0.0 btu/hr	2.0 btu/hr	
Percent	1.0%	0.0%	5.0%	1.0%	0.0%	5.0%	
Sensor Source							
Outside Air Temp	Local	Local	BMS	Local	Local	BMS	
Outside %RH	Local	Local	BMS	Local	Local	BMS	
Space Temp	Local	Local	BMS	Local	Local	BMS	
Space %RH	Local	Local	BMS	Local	Local	BMS	
Return Air Temp	Local	Local	BMS	--	--	--	
Return %RH	Local	Local	BMS	--	--	--	
Space 1 CO2	Local	Local	BMS	Local	Local	BMS	
Space 2 CO2	Local	Local	BMS	Local	Local	BMS	
Return CO2	Local	Local	BMS	Local	Local	BMS	
Space Static Pressure	Local	Local	BMS	Local	Local	BMS	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Backup/Restore							
Backup Settings							
Save in	Int. Memory	Int. Memory	USB Drive	Int. Memory	Int. Memory	USB Drive	
Save	Do Not Save (□)	Do Not Save (□)	Save (☒)	Do Not Save (□)	Do Not Save (□)	Save (☒)	
USB Restore							
Disable Unit Prior to Restore	Disabled	Disabled	Enabled	Disabled	Disabled	Enabled	
Enable Restore	No Restore (□)	No Restore (□)	Restore (☒)	No Restore (□)	No Restore (□)	Restore (☒)	
Internal Restore							
Disable Unit Prior to Restore	Disabled	Disabled	Enabled	Disabled	Disabled	Enabled	
Enable Restore	No Restore (□)	No Restore (□)	Restore (☒)	No Restore (□)	No Restore (□)	Restore (☒)	
Last Save Time	hh: mm mm/dd/yy			hh: mm mm/dd/yy			
IO Status/Offset							
Input Offset							
Ch↑↓:	Press Enter to select the analog input channel						
Offset:	Press Enter again to select a value to offset the input by						
Value:	Current Value of the Channel selected						
Channel Menu							
IO Type:	Select the IO Type: Univ Ch, Digital In, Digital Out, Analog Out						
Ch↑↓:	Select the Channel: Dependent on control boards installed						
Value:	Current Value of the Channel selected						
Unit Config							
Exp 1	Not Installed	Not Installed, Standard c.pCO, c.pCOe		Not Installed	Not Installed, Standard c.pCO, c.pCOe		
Exp 2	Not Installed	Not Installed, Standard c.pCO, c.pCOe		Not Installed	Not Installed, Standard c.pCO, c.pCOe		
Exp 3	Not Installed	Not Installed, Standard c.pCO, c.pCOe		Not Installed	Not Installed, Standard c.pCO, c.pCOe		
Exp 4	Not Installed	Not Installed, Standard c.pCO, c.pCOe		--	--	--	
Exp 5	Not Installed	Not Installed, Standard c.pCO, c.pCOe		--	--	--	
Exp 6	Not Installed	Not Installed, Standard c.pCO, c.pCOe		--	--	--	Expansion Board Enabled
Expansion Connection Port	FBus2 to BMS2	FBus2 to BMS2	Ethernet IP	FBus2 to BMS2	FBus2 to BMS2	Ethernet IP	
FB2 Expansion Board							
Baud Rate	19200	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		19200	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		
Stop_Bits	1	1	2	1	1	2	
Parity	none	none, odd, even		none	none, odd, even		
Belimo Actuators Quantity	0	0	16	--	--	--	
Airflow Monitoring Density Calc	Enabled (☒)	Disabled (□)	Enabled (☒)	Disabled (□)	Disabled (□)	Enabled (☒)	
Supply Fan Control Type	Constant Volume	Constant Volume, Duct Static, Space Static, Hardwired Input, Single Zone VAV, CFM Control		Constant Volume	Constant Volume, Duct Static, Space Static, Hardwired Input, Single Zone VAV, CFM Control		
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Supply Fan Control K Factor	0.0	0.0	99999.9	0.0	0.0	99999.9	Default determined by the unit purchased
Exhaust Fan Control Type	Not Installed	Not Installed, Constant Volume, Space Static, Sup Track w/Off, Pool Space Static, CFM Control, Hardwired, Rtn Duct Static		Not Installed	Not Installed, Constant Volume, Space Static, Sup Track w/Off, Pool Space Static, CFM Control, Hardwired, Rtn Duct Static		
Exhaust Fan Control K Factor	0.0	0.0	99999.9	0.0	0.0	99999.9	Default determined by the unit purchased
Return Fan Control Type	Not Installed	Not Installed, Constant Volume, Rtn Duct Static, Rtn Duct Stat Trk, CFM Control, Space Static, Hardwired, Sup Track w/Off		--	--	--	
Return Fan Control K Factor	0.0	0.0	99999.9	--	--	--	Default determined by the unit purchased
Scavenger Fan Control Type	Not Installed	Not Installed, Constant Volume, Hardwired		--	--	--	
Regeneration Fan Control Type	Not Installed	Not Installed, Constant Volume		--	--	--	
Dehumidification Mode Installed	Disabled (☐)	Disabled (☐)	Enabled (☒)	Disabled (☐)	Disabled (☐)	Enabled (☒)	
Occupied Dehum Call Enabled	Inside RH AND Inside Dewpoint OR Outside Dewpoint	Inside RH, Inside Dewpoint, Outside Dewpoint, Inside RH OR Inside Dewpoint, Inside RH OR Inside Dewpoint OR Outside Dewpoint, Inside RH AND Inside Dewpoint, Inside RH AND Inside Dewpoint OR Outside Dewpoint		Inside RH AND Inside Dewpoint OR Outside Dewpoint	Inside RH, Inside Dewpoint, Outside Dewpoint, Inside RH OR Inside Dewpoint, Inside RH OR Inside Dewpoint OR Outside Dewpoint, Inside RH AND Inside Dewpoint, Inside RH AND Inside Dewpoint OR Outside Dewpoint		
Unoccupied Dehum Call Enabled	Inside RH	Inside RH, Inside Dewpoint, Inside RH OR Inside Dewpoint, Inside RH AND Inside Dewpoint		Inside RH	Inside RH, Inside Dewpoint, Inside RH OR Inside Dewpoint, Inside RH AND Inside Dewpoint		
Unocc Unit Operation	Night Setback Cycle	Night Setback Cycle, Normal Op wUnoc Spts, Recirc wUnoc Spts		Night Setback Cycle	Night Setback Cycle, Normal Op wUnoc Spts, Recirc wUnoc Spts		
Morning Warm Up	Disabled (☐)	Disabled (☐)	Enabled (☒)	CMN	Disabled (☐)	Enabled (☒)	
Morning Cool Down	Disabled (☐)	Disabled (☐)	Enabled (☒)	CMN	Disabled (☐)	Enabled (☒)	
Max Duration	30 min	0 min	99 min	30 min	0 min	99 min	
Economizer Installed	Disabled (☐)	Disabled (☐)	Enabled (☒)	CMN	Disabled (☐)	Enabled (☒)	
Econ w/Mech Clg	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
CO2 Control	Not Installed (☐)	Not Installed (☐)	Installed (☒)	CMN	Not Installed (☐)	Installed (☒)	
OAD CFM Control	Not Installed (☐)	Not Installed (☐)	Installed (☒)	CMN	Not Installed (☐)	Installed (☒)	
Min OAD CFM Control	Not Installed (☐)	Not Installed (☐)	Installed (☒)	CMN	Not Installed (☐)	Installed (☒)	
Master Slave	Disabled (☐)	Disabled (☐)	Enabled (☒)	--	--	--	
Cooling Enabled	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
Controls Lite Mode	Setpoint	Setpoint	Demand	Setpoint	Setpoint	Demand	
Heating Enabled	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
Case Heat Installed	Not Installed (☐)	Not Installed (☐)	Installed (☒)	Not Installed (☐)	Not Installed (☐)	Installed (☒)	
Humid w/Mech Clg	Disabled (☐)	Disabled (☐)	Enabled (☒)	--	--	--	
Compressor Config - Stage	Read only			Read only			up to 8 compressors
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Pool Unit Installed	Not Installed (□)	Not Installed (□)	Installed (☒)	--	--	--	
Direct Control Enabled	Disabled (□)	Disabled (□)	Enabled (☒)	--	--	--	
Compressor Config - Ramp	Read only			Read only			Up to 8 compressors
Compressor Config - Circuit	Read only			Read only			Up to 8 compressors
Compressor Config - Modulates	Read only			Read only			Up to 8 compressors
Change Lead Lag Mode	Lead	Lead, Lag, w/Dehumid, Weekly		w/Dehumid	Lead, Lag, w/Dehumid, Weekly		
Change Lead Lag Day	Monday	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday		Monday	Not Installed, Standard c.pCO, c.pCOe		Shows when Weekly is selected
Ramp 1 Lead Order Stage (1-8)	1	1	# Comps on Ramp	1	1	# Comps on Ramp	Valent has only 1 Cooling Ramp with up to 4 stages
Ramp 1 Lag Order Stage (1-8)	1	1	# Comps on Ramp	1	1	# Comps on Ramp	Valent has only 1 Cooling Ramp with up to 4 stages
Ramp 2 Lead Order Stage (1-8)	1	1	# Comps on Ramp	--	--	--	
Ramp 2 Lag Order Stage (1-8)	1	1	# Comps on Ramp	--	--	--	
Ramp 3 Lead Order Stage (1-8)	1	1	# Comps on Ramp	--	--	--	
Ramp 3 Lag Order Stage (1-8)	1	1	# Comps on Ramp	--	--	--	
Ramp 4 Lead Order Stage (1-8)	1	1	# Comps on Ramp	--	--	--	
Ramp 4 Lag Order Stage (1-8)	1	1	# Comps on Ramp	--	--	--	
OAD Space Static Enabled	Disabled (□)	Disabled (□)	Enabled (☒)	Disabled (□)	Disabled (□)	Enabled (☒)	
Reheat Plus Enabled	Disabled (□)	Disabled (□)	Enabled (☒)	Disabled (□)	Disabled (□)	Enabled (☒)	For Valent only show when Reheat Plus is Installed from CMN
Heat Pump Defrost Enabled	Disabled (□)	Disabled (□)	Enabled (☒)	Enabled (☒)	Disabled (□)	Enabled (☒)	Shows when unit is configured as an ASHP
Max Elec Heat	--	--	--	100%	0%	100%	
CMN Breakout							
BMS Comm	--	--	--	Stand Alone, Lontalk, BACnet IP, BACnet MSTP, Modbus RTU, Modbus IP			Valent CMN
Dmp Ctrl	--	--	--	100% Outside Air, Recirculating			Valent CMN
Sup Fan	--	--	--	Constant Volume, VAV Duct Static, Hardwired Input, BMS, CV Damper Static, Space Static, Single Zone VAV, CFM Control			Valent CMN
CO2 Ctrl	--	--	--	Disabled, Enabled			Valent CMN
Exh Fan	--	--	--	None, Supply Tracking, Space Pressure, Hardwired, BMS Control, CFM Control			Valent CMN
Rem Dmp	--	--	--	Disabled, BMS Control, CFM Control			Valent CMN
PreHeat	--	--	--	None, Installed			Valent CMN
Air Flow	--	--	--	None, Supply Inlet Cone, IAQ Damper, Supply Inlet & IAQ Damper, Exhaust Inlet Cone, Supply & Exhaust Inlet Cones, Exhaust Inlet & IAQ Damper, SF/EF Inlets & IAQ Damper			Valent CMN
Heating	--	--	--	None, Gas 1 or 2 burner, Gas and Electric, Electric Only, 12:1 Gas, Hot Water, 6:1 Gas, 10:1-2 Furnace Gas			Valent CMN
Cooling	--	--	--	None, 1 Compressor, 2 Compressors, 4 Compressors, 1 Mod Comp, 2 Comps w/Mod, 4 Comps w/Mod, Chilled Water			Valent CMN
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Enrg Rec	--	--	--	None, Heat Wheel w/VFD, Heat Wheel On/Off, Sensible Plate, Enthalpic Plate, Enthalpic Plate with Bypass			Valent CMN
Economizer	--	--	--	None, Installed			Valent CMN
AMD Type	--	--	--	Standard, Thermal Dispersion			Valent CMN
Cond Fan	--	--	--	None, 1 Fan, 2 Fans, 3 Fans, 4 Fans, 6 Fans, 8 Fans			Valent CMN
Cond HPC	--	--	--	None, 1.0 A Only, 1.0 B Only, 1.0 A and B, 2.0 A Only, 2.0 B Only, 2.0 A and B, 2.0 A/B Split			Valent CMN
Heat Pump	--	--	--	None, ASHP, WSHP			Valent CMN
AM Warm Up	--	--	--	None, Installed			Valent CMN
HGRH/Dehumidification	--	--	--	None, Installed			Valent CMN
Heat Wheel Rotation Sensor	--	--	--	None, Installed			Valent CMN
Setpoint Adjustment	--	--	--	None, Slider, BAPI Stat			Valent CMN
Compressor Modulation	--	--	--	None, DSC, INV			Valent CMN
Condensate Overflow Switch	--	--	--	None, Installed			Valent CMN
OA AMD Calculation							
Area	0.0	0.0	9999.9	0.0	0.0	9999.9	Default determined by the unit purchased
K	0.0	0.0	9999.9	0.0	0.0	9999.9	Default determined by the unit purchased
m	0.0	0.0	999.999	0.0	0.0	999.999	Default determined by the unit purchased
Min OA AMD Calculation							
Area	0.0	0.0	9999.9	--	--	--	Default determined by the unit purchased
K	0.0	0.0	9999.9	--	--	--	Default determined by the unit purchased
m	0.0	0.0	999.999	--	--	--	Default determined by the unit purchased
Unit Settings							
Timezone	11 (America/ Chicago Central Time)	1	84	11 (America/ Chicago Central Time)	1	84	Table available upon request
Time and Date							
Time	Current Time	12:00 AM	11:59PM	Current Time	12:00 AM	11:59PM	
Date	Current Date	Jan 1, 2000	Dec 31, 2099	Current Date	Jan 1, 2000	Dec 31, 2099	
Temperature	°F	°F	°C	°F	°F	°C	
Static Pressure	"wc	"wc	Pa	"wc	"wc	Pa	
Air Flow	cfm	cfm	m3/h	cfm	cfm	m3/h	
Pressure	psi	psi	bar	psi	psi	bar	
Enthalpy	btu/lb	btu/lb	KJ/Kg	btu/lb	btu/lb	KJ/Kg	
Fluid Flow	gpm	gpm	l/min	gpm	gpm	l/min	
Distance	in	in	cm	in	in	cm	
Unit Altitude	830 ft	0 ft	10000ft	830 ft	0 ft	10000ft	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
FB1 Serial Config							
Baud Rate	9600	1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200		--	--	--	
Stop Bits	1	1	2	--	--	--	
Parity	none	none, odd, even		--	--	--	
Advanced Alarm Logging Enable	Enabled (☑)	Disabled (☐)	Enabled (☑)	Enabled (☑)	Disabled (☐)	Enabled (☑)	
Power Loss Startup Auto Restart	Enabled (☑)	Disabled (☐)	Enabled (☑)	Enabled (☑)	Disabled (☐)	Enabled (☑)	
Service Info							
Unit Information							
Prg Initials	Read Only			Read Only			
Job Name	Read Only			Read Only			
SO#	Read Only			Read Only			
Unit	Read Only			Read Only			
Date	Read Only			Read Only			
Version	Read Only			Read Only			
Blackout Information							
Record	# of Total records			# of Total records			
Power cycled	MM/DD/YY HH:MM.SS			MM/DD/YY HH:MM.SS			
Power lost for	x Days, x Hours, x Mins			x Days, x Hours, x Mins			
c.pCO Board Info							
Cycle Time	Read Only			Read Only			
Cycles (per second)	Read Only			Read Only			
Board Temp	Read Only			Read Only			
Board Power	Read Only			Read Only			
Compressor Info							
Run Hours	Read Only			Read Only			Reset available
# of Starts	Read Only			Read Only			Reset available
Compressor Maintenance Alarm Setpoint	9999999	0	9999999	9999999	0	9999999	
EOL Test							
Enable EOLT	--	--	--	Disabled (☐)	Enabled (☑)	Disabled (☐)	Hidden (Factory Password)
Alarm Management							
Shutdown Alarms							
Supply High Static Alarm Setpt	5.000 "wc	0.000 "wc	5.000 "wc	4.000 "wc	0.000 "wc	5.000 "wc	
Return Low Static Alarm Setpt	-5.000 "wc	0.00 "wc	-5.000 "wc	--	--	--	
Supply Temp Low Limit							
Alarm Setpt	40.0°F	0.0°F	100.0°F	35.0°F	30.0°F	50.0°F	
Delay	5 min	0 min	15 min	5 min	0 min	15 min	
Supply Temp High Limit							
Alarm Setpt	120.0°F	50.0°F	300.0°F	120.0°F	90.0°F	120.0°F	
Delay	3 min	0 min	15 min	3 min	0 min	15 min	
Note: setpoint availability varies based on unit configuration.							

TABLE 10: SETPOINTS DATA							
CONTROL VARIABLE	INNOVENT			VALENT			NOTES
	DEFAULT	MIN.	MAX.	DEFAULT	MIN.	MAX.	
Space High Static Alarm Setpt	0.200 "wc	0.000 "wc	5.000 "wc	0.200 "wc	-0.500 "wc	0.500 "wc	
Shutdown Alarm Lockout Enable	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
Supply Fan Alarm Shutdown Unit	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
Unit Shutdown on Multiple Supply Fan Alarms	All	Any	All	--	--	--	
Exhaust Fan Alarm Shutdown Unit	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
Unit Shutdown on Multiple Exhaust Fan Alarms	All	Any	All	--	--	--	
Return Fan Alarm Shutdown Unit	Enabled (☒)	Disabled (☐)	Enabled (☒)	--	--	--	
Unit Shutdown on Multiple Return Fan Alarms	All	Any	All	--	--	--	
Scavenger Fan Alarm Shutdown Unit	Enabled (☒)	Disabled (☐)	Enabled (☒)	--	--	--	
Regen Fan Alarm Shutdown Unit	Enabled (☒)	Disabled (☐)	Enabled (☒)	--	--	--	
General Alarms							
Alarm Digital Output Type	Any Alarm	Shutdown	Any Alarm	Any Alarm	Shutdown	Any Alarm	
High Saturated Discharge Temperature	150.0°F	100.0°F	160.0°F	--	--	--	
Low Saturated Suction Temperature	25.0°F	0.0°F	40.0°F	25.0°F	0.0°F	40.0°F	WSHP only
Operating Envelope							
Alarm Delay	600 sec	0 sec	3600 sec	--	--	--	
Lockout Duration	1800 sec	0 sec	3600 sec	--	--	--	
High Discharge Temp Alarm Setpt	250.0°F	100.0°F	300.0°F	--	--	--	
High Suction Pressure Alarm Setpt	170°F	150.0°F	200.0°F	--	--	--	
Low Condenser Pressure Offset	10.0 Δpsi	0.0 Δpsi	100.0 Δpsi	--	--	--	
Superheat Alarms							
High Setpt	35.0°F	15.0°F	40.0°F	--	--	--	
Low Setpt	10.0°F	6.0°F	15.0°F	--	--	--	
Fan Alarm Delay	60 sec	30 sec	120 sec	60 sec	30 sec	120 sec	
Internal Board Temp	Enabled (☒)	Disabled (☐)	Enabled (☒)	Enabled (☒)	Disabled (☐)	Enabled (☒)	
Outside Filter Alarm Setpt	2.000 "wc	0.000 "wc	5.000 "wc	--	--	--	
Return Filter Alarm Setpt	2.000 "wc	0.000 "wc	5.000 "wc	--	--	--	
Note: setpoint availability varies based on unit configuration.							

ALARMS DATA

ALARM ID	ALARM SCREEN LINE 1	ALARM SCREEN LINE 2	RESET TYPE	LOCKOUT	ACTION TYPE	NOTES
1	Supply Fan 1 Run	Status Not Proven	Auto		Optional Shutdown Unit	
2	Fire/Smoke Alarm	In Alarm Position	Auto		Shutdown Unit	
3	Phase Protection	Relay Tripped	Auto		Shutdown Unit	
4	Freeze Protection	Thermostat Tripped	Manual		Shutdown Unit	
5	High Supply Duct	Static Pressure	Manual		Shutdown Unit	
6	Low Return Duct	Static Pressure	Manual		Shutdown Unit	
7	Outside Air Temp	Sensor Value Not Valid	Auto		Informational	
8	Supply Air Temperature	Sensor Value Not Valid	Auto		Shutdown Unit	
9 - 10	Cold Coil (x) Temp	Sensor Value Not Valid	Auto		Disable Cooling Ramp	
11	Exhaust Air Temp	Sensor Value Not Valid	Auto		Disable Defrost	
12	HX LA Temperature	Sensor Value Not Valid	Auto		Informational	
13	Mixed Air Temperature	Sensor Value Not Valid	Auto		Informational	
14	Preheat Leaving Temp	Sensor Value Not Valid	Auto		Disable Preheat	
15	Return Air Temperature	Sensor Value Not Valid	Auto		Disable Return Temp/Dewpoint Control	
16	Space Temperature	Sensor Value Not Valid	Auto		Disable Space Temp/Dewpoint Control	
17	Return Air RH	Sensor Value Not Valid	Auto		Disable Return RH/Dewpoint Control	
18	Space RH	Sensor Value Not Valid	Auto		Disable Space RH/Dewpoint Control	
19	Supply Air RH	Sensor Value Not Valid	Auto		Disable Supply RH/Dewpoint Control	
20	HX Leaving RH	Sensor Value Not Valid	Auto		Informational	
21	Outside RH	Sensor Value Not Valid	Auto		Disable OA RH/Dewpoint Control	
22 - 23	Cold Coil (x) RH	Sensor Value Not Valid	Auto		Informational	
24	Exhaust Air RH	Sensor Value Not Valid	Auto		Informational	
25	Preheat Leaving RH	Sensor Value Not Valid	Auto		Informational	
26 - 29	Low Pressure Switch	Circuit (x)	Auto until Lockout	3x in 1 hr	Disable Compressor Circuit	
30 - 33	High Pressure Switch	Circuit (x)	Auto		Disable Compressor Circuit	Manual at the Switch
34	Damper Proving Switch	Dampers are closed	Manual		Shutdown Unit	
35	Exhaust Fan 1 Run	Status Not Proven	Manual		Optional Shutdown Unit	
36	Return Fan 1 Run	Status Not Proven	Manual		Optional Shutdown Unit	
37	Pre-Filters are Dirty	Replace Filters	Auto		Informational	
38	OA Filters are Dirty	Replace Filters	Auto		Informational	
39	RA Filters are Dirty	Replace Filters	Auto		Informational	
40	Cond Drain Pan Full	Check Drain	Manual		Shutdown Unit	
41 - 44	Exp Board (x) Status	Board is Offline	Auto		Shutdown Unit	
45 - 48	Low Pressure Switch	Circuit (x)	Auto until Lockout	3x in 1 hr	Disable Compressor Circuit	
49 - 52	High Pressure Switch	Circuit (x)	Auto		Disable Compressor Circuit	Manual at the Switch
53 - 64	Belimo Act (x) Comm	Actuator is Offline	Auto		Informational	
65	Non Volatile Memory Er	Contact Technical Support	Auto		Informational	
66 - 68	Supply Fan (x) Run	Status Not Proven	Manual		Optional Shutdown Unit	
69 - 71	Exhaust Fan (x) Run	Status Not Proven	Manual		Optional Shutdown Unit	
72 - 74	Return Fan (x) Run	Status Not Proven	Manual		Optional Shutdown Unit	
75 - 78	Scavenger Fan (x) Run	Status Not Proven	Manual		Optional Shutdown Unit	
79	Mixed Air RH	Sensor Value Not Valid	Auto		Informational	

TABLE 11: ALARMS DATA						
ALARM ID	ALARM SCREEN LINE 1	ALARM SCREEN LINE 2	RESET TYPE	LOCKOUT	ACTION TYPE	NOTES
80	Supply Water Temp 1	Sensor Value Not Valid	Auto		Disable Compressors	WSHP
81	Return Water Temp 1	Sensor Value Not Valid	Auto		Disable Compressors	WSHP
82	Reac Whl In Temp	Sensor Value Not Valid	Auto		50% DFF Control	
83	Reac Whl Out Temp	Sensor Value Not Valid	Auto		Informational	
84 - 85	Cold Coil (x) Temp	Sensor Value Not Valid	Auto		Disable Cooling Ramp	
86 - 87	Cold Coil (x) RH	Sensor Value Not Valid	Auto		Informational	
88	Return Filter Pressure	Sensor Value Not Valid	Auto		Informational	
89	Space 1 CO2	Sensor Value Not Valid	Auto		Disable CO2	
90	Space Static Pressure	Sensor Value Not Valid	Auto		Informational	
91	OA Filter Pressure	Sensor Value Not Valid	Auto		Informational	
92	Supply Duct Stat Press	Sensor Value Not Valid	Auto		Disable Static Press Control	
93	Return Duct Stat Press	Sensor Value Not Valid	Auto		Disable Static Press Control	
94 - 97	Sup Fan (x) AFMS	Sensor Value Not Valid	Auto		Informational	
98 - 101	Ret Fan (x) AFMS	Sensor Value Not Valid	Auto		Informational	
102 - 105	Exh Fan (x) AFMS	Sensor Value Not Valid	Auto		Informational	
106	Min Outside Dmpr AFMS	Sensor Value Not Valid	Auto		Informational	
107	Outside Damper AFMS	Sensor Value Not Valid	Auto		Informational	
108	HW Exhaust Pressure	Sensor Value Not Valid	Auto		Disable Wheel Ex Bypass	Heat Wheel
109	HW Supply Pressure	Sensor Value Not Valid	Auto		Disable Wheel Ex Bypass	Heat Wheel
110 - 121	Zone (x) Space Temp	Sensor Value Not Valid	Auto		Disable Zone Control	
122	Space Setpt Adj Slider	Sensor Value Not Valid	Auto		Informational	
123	Space 2 CO2	Sensor Value Not Valid	Auto		Disable CO2	
124	Return CO2	Sensor Value Not Valid	Auto		Disable CO2	
125 - 132	Discharge Press Ckt (x)	Sensor Value Not Valid	Auto		Disable Compressor Circuit	
133 - 140	Suction Press Ckt (x)	Sensor Value Not Valid	Auto		Disable Compressor Circuit	Only with EVD for Valent
141 - 148	Discharge Temp Ckt (x)	Sensor Value Not Valid	Auto		Disable Compressor Circuit	Only with EVD for Valent
149 - 156	Suction Temp Ckt (x)	Sensor Value Not Valid	Auto		Disable Compressor Circuit	Only with EVD for Valent
157 - 164	High Disch Temp Ckt (x)	Compressors Disabled	Auto		Disable Compressor Circuit	
165 - 172	High Superheat Ckt (x)	Compressors Disabled	Manual		Disable Compressor Circuit	
173 - 180	Low Superheat Ckt (x)		Auto		Disable Compressor Circuit	
181 - 188	High Compression	Ckt (x) Comps Disabled	Auto until Lockout	3x in 1 hr	Disable Compressor Circuit	
189 - 196	High Suction Pressure	Ckt (x) Comps Disabled	Auto until Lockout	3x in 1 hr	Disable Compressor Circuit	
197 - 204	Low Condenser Pressure	Ckt (x) Comps Disabled	Auto until Lockout	3x in 1 hr	Disable Compressor Circuit	
205 - 212	Ckt A High Saturated	Discharge Temperature	Auto		Disable Compressor Circuit	
213 - 220	Ckt A Low Saturated	Suction Temperature	Auto		Disable Compressor Circuit	
221	Supply Air Temperature	Low Limit Shutdown	Manual		Shutdown Unit	
222	Heat Wheel Rotation	Not Detected	Auto		Informational	
223 - 226	Slave Unit (x) Offline		Auto		Informational	
227	Master Unit Offline		Auto		Disable Slave Mode	
228 - 235	Ckt (x) Abnormal Press	Compressors Disabled	Auto		Disable Compressor Circuit	
236	Heat Pump Defrost	Mode is Active	Auto	3x in 1 hr	Informational	
237	Multi Devices per Ch	Contact Technical Support	Auto		Informational	
238 - 239	Exp Board (x) Failure	Board is Offline	Auto		Shutdown Unit	
240	Shutdown Contact	In Alarm Position	Auto		Shutdown Unit	
241	Cold Deck Temperature	Sensor Value Not Valid	Auto		Disable Cold Deck Control	
242	Hot Deck Temperature	Sensor Value Not Valid	Auto		Disable Hot Deck Control	

TABLE 11: ALARMS DATA						
ALARM ID	ALARM SCREEN LINE 1	ALARM SCREEN LINE 2	RESET TYPE	LOCKOUT	ACTION TYPE	NOTES
243	Neutral Deck Temp	Sensor Value Not Valid	Auto		Informational	
244	Comp Maint Alarm	Run Hours Spt Reached	Manual		Informational	
245	Supply Air Temperature	High Limit Shutdown	Manual		Shutdown Unit	
246	Space High Static Pres	Shutdown	Manual		Shutdown Unit	
247 - 254	Liquid Pres Ckt (x)	Sensor Value Not Valid	Auto		Switch to Discharge or 100% Cond Fan	
255	Internal Board Temp	Exceeds -40F or 158F	Auto		Informational	
256	Regeneration Fan Run	Status Not Proven	Auto		Disable Regen Control	
257 - 264	Water Flow Ckt (x)	Flow Switch not made	Manual		Disable Compressor Circuit	
265	Pre Cooling Coil Temp	Sensor Value Not Valid	Auto		Disable PreCooling	
266	Post Cooling Coil Temp	Sensor Value Not Valid	Auto		Informational	
267	BMS Offline	Watchdog is FALSE	Auto		Local Control	
268 - 275	Liquid Temp Ckt (x)	Sensor Value Not Valid	Auto		Switch to Discharge or 100% Cond Fan	
276	Clg Coil Setpt Input	Value is not valid	Auto		Informational	Controls Lite - Setpt Mode
277	Sup Air Setpt Input	Value is not valid	Auto		Informational	Controls Lite - Setpt Mode
278	Cond Circuit (x)	Overload Tripped	Auto		Disable Compressor Circuit	
286	Supply Fan	Overload Tripped	Auto		Informational	
287	Exhaust Fan	Overload Tripped	Auto		Informational	
288	Generic Fan	Overload Tripped	Auto		Informational	
289	BACnet License	Not Installed	Auto		Informational	
290	Regen Low Temp	Check Furnace	Auto		Informational	
291	Water Leak	Detected	Manual		Disable Compressors	
292	Oil Level Switch	Inverter Compressor	Auto		Disable Inverter Circuit	
293	Supply Water Temp 2	Sensor Value Not Valid	Auto		Disable Compressors	WSHP
294	Return Water Temp 2	Sensor Value Not Valid	Auto		Disable Compressors	WSHP
295 - 296	Low Suction SH ExV (x)	EVD Alarm	Auto		Disable Inverter Circuit	Only with EVD
297 - 298	LOP (x) EVD 1	Low Operating Pressure	Auto		Disable Inverter Circuit	Only with EVD
299 - 300	MOP (x) EVD 1	Max Operating Pressure	Manual		Disable Inverter Circuit	Only with EVD
301 - 302	EEV (x) EVD 1	Motor Alarm	Auto		Disable Inverter Circuit	Only with EVD
303 - 304	LowSuct (x) EVD 1	Refrigerant Temp	Auto		Disable Inverter Circuit	Only with EVD
305	High Condensing Temp		Auto		Disable Inverter Circuit	Only with EVD
306	Suction Press Sens S1	Sensor Value Not Valid	Auto		Disable Inverter Circuit	Only with EVD
307	Suction Temp Sens S2	Sensor Value Not Valid	Auto		Disable Inverter Circuit	Only with EVD
308	Probe S3 - Not Used	Sensor Value Not Valid	Auto		Disable Inverter Circuit	Only with EVD
309	Dschg Temp Sens S4	Sensor Value Not Valid	Auto		Disable Inverter Circuit	Only with EVD
310	EVD EEPROM Damaged	Call Technical Support	Auto		Disable Inverter Circuit	Only with EVD
311	Incomplete Closing EVD		Auto		Disable Inverter Circuit	Only with EVD
312	Emergency Closing EVD		Auto		Disable Inverter Circuit	Only with EVD
313	EVD Battery	Replace Battery	Auto		Disable Inverter Circuit	Only with EVD
314	FW Incompatibility	Call Technical Support	Auto		Disable Inverter Circuit	Only with EVD
315	EVD Config Error		Auto		Disable Inverter Circuit	Only with EVD
316	EVD Comm	EVD is Offline	Auto		Disable Inverter Circuit	Only with EVD
317	High Discharge Temp	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
318	Low Discharge Pressure	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
319	High Suction Pressure	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll

TABLE 11: ALARMS DATA						
ALARM ID	ALARM SCREEN LINE 1	ALARM SCREEN LINE 2	RESET TYPE	LOCKOUT	ACTION TYPE	NOTES
320	Low Suction Pressure	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
321	High Current	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
322	High Pressure Ratio	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
323	Low Pressure Ratio	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
324	Low Delta P	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
325	High Discharge Press	Inverter Compressor	Auto until Lockout	3x in 1 hr	Disable Inverter Circuit	Only with Inverter Scroll
326 - 327	WSHP Freeze	Protection Circuit (x)	Auto		Disable Compressors	
328 - 329	Low Entering Water	Temp - Circuit (x)	Auto		Informational	
330 - 331	High Entering Water	Temp - Circuit (x)	Auto		Informational	
332	Compressor Staging	Order Skipped	Auto		Informational	
333	HP Defrost 3 Strike	HP Heating Not Avail	Manual		Disable HP Heating	2 hours + Temp Rise for Reset
334	EVD Error	Unexpected Position	Auto			

BACNET / MODBUS POINTS LIST FOR VALENT UNITS

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS										
VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Analog Inputs – Read Only										
Cold_Coil_1_Temp_Analog_Input	Cold Coil 1 Temperature			25	AI	ReadCOV_NoWrite	0.1	30244	Input	2
Exhaust_Temp_Analog_Input	Exhaust Temperature			30	AI	ReadCOV_NoWrite	0.1	30254	Input	2
CL_Coil_Spt_Temp	Controls Lite Cooling Coil Setpoint Temperature			31	AI	ReadCOV_NoWrite	0.1	30256	Input	2
CL_Supply_Spt_Temp	Controls Lite Supply Setpoint Temperature			32	AI	ReadCOV_NoWrite	0.1	30258	Input	2
Mixed_Temp_Analog_Input	Mixed Temperature			35	AI	ReadCOV_NoWrite	0.1	30264	Input	2
Outside_Air_Temp_Analog_Input	Outside Air Temperature			37	AI	ReadCOV_NoWrite	0.1	30268	Input	2
Return_Temp_Analog_Input	Return Temperature			41	AI	ReadCOV_NoWrite	0.1	30276	Input	2
Leaving_Water_Temp_1_Analog_Input	Leaving Water Temperature Circuit A			42	AI	ReadCOV_NoWrite	0.1	30278	Input	2
Space_Setpoint_Slider_Analog_Input	Space Setpoint Slider Analog Input			43	AI	ReadCOV_NoWrite	0.1	30280	Input	2
Space_Temp_Analog_Input	Space Temperature			44	AI	ReadCOV_NoWrite	0.1	30282	Input	2
Supply_Temp_Analog_Input	Supply Temperature			45	AI	ReadCOV_NoWrite	0.1	30284	Input	2
Entering_Water_Temp_1_Analog_Input	Entering Water Temperature Circuit A			46	AI	ReadCOV_NoWrite	0.1	30286	Input	2
Outside_RH_Analog_Input	Outside % Relative Humidity			86	AI	ReadCOV_NoWrite	0.1	30350	Input	2
Return_RH_Analog_Input	Return % Relative Humidity			88	AI	ReadCOV_NoWrite	0.1	30354	Input	2
Space_RH_Analog_Input	Space % Relative Humidity			89	AI	ReadCOV_NoWrite	0.1	30356	Input	2
Space_Static_Pressure_Analog_Input	Space Static Pressure			94	AI	ReadCOV_NoWrite	0.001	30366	Input	2
Supply_Duct_Static_Pressure_Analog_Input	Supply Duct Static Pressure			95	AI	ReadCOV_NoWrite	0.01	30368	Input	2
Space_CO2_1_Analog_Input	Space 1 CO2 ppm			116	AI	ReadCOV_NoWrite	10	30402	Input	2
Circuit_A_Discharge_Pressure_Analog_Input	Circuit A Discharge Pressure			119	AI	ReadCOV_NoWrite	0.1	30408	Input	2
Circuit_B_Discharge_Pressure_Analog_Input	Circuit B Discharge Pressure			121	AI	ReadCOV_NoWrite	1	30412	Input	2
Exhaust_Fan_Speed_Analog_Input	Exhaust Fan Speed Remote Command Analog Input value			143	AI	ReadCOV_NoWrite	1	30456	Input	2
Supply_Fan_Speed_Analog_Input	Supply Fan Speed Remote Command Analog Input value			155	AI	ReadCOV_NoWrite	1	30462	Input	2
Entering_Water_Temp_2_Analog_Input	Entering Water Temperature Circuit B			161	AI	ReadCOV_NoWrite	0.1	30468	Input	2
Leaving_Water_Temp_2_Analog_Input	Leaving Water Temperature Circuit B			162	AI	ReadCOV_NoWrite	0.1	30470	Input	2
Analog Values – Read/Write – Commandable										
Temperature_Setpoint	Main Temperature Setpoint Supply, Space, or Return Target Temperature			1	AV	ReadCOV_Commandable	0.1	40002	Holding	2
Temperature_Heat_Cool_Deadband	Heat/Cool Spt Deadband when Space or Return control is active Clg Spt = Offset/2 + Temp Spt Htg Spt = Offset/2 - Temp Spt			2	AV	ReadCOV_Commandable	0.1	40004	Holding	2
Cooling_Coil_Setpoint	Cooling Coil Leaving Air Setpoint			3	AV	ReadCOV_Commandable	0.1	40006	Holding	2
Dehumidification_Setpoint	Dehumidification Setpoint %RH for Space or Return control			5	AV	ReadCOV_Commandable	0.1	40010	Holding	2

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Outside_Dewpoint_Setpoint	Outside Dewpoint Dehumidification Trigger Setpoint			6	AV	ReadCOV_Commandable	0.1	40012	Holding	2
Inside_Dewpoint_Setpoint	Inside Dewpoint Dehumidification Trigger Setpoint			7	AV	ReadCOV_Commandable	0.1	40014	Holding	2
Unocc_Inside_Dewpoint_Setpoint	Unoccupied Inside Dewpoint Dehumidification Trigger Setpoint			9	AV	ReadCOV_Commandable	0.1	40018	Holding	2
Unoccupied_Cooling_Setpoint	Unoccupied Cooling Setpoint			10	AV	ReadCOV_Commandable	0.1	40020	Holding	2
Unoccupied_Dehumidification_Setpoint	Unoccupied Dehumidification %RH Setpoint			11	AV	ReadCOV_Commandable	0.1	40022	Holding	2
Unoccupied_Heating_Setpoint	Unoccupied Heating Setpoint			12	AV	ReadCOV_Commandable	0.1	40024	Holding	2
Economizer_Temp_Enable_Setpoint	Economizer Ambient Temp Enable Setpoint Allow Econ when OAT<Spt			16	AV	ReadCOV_Commandable	0.1	40032	Holding	2
Economizer_Enthalpy_Enable_Setpoint	Economizer Enthalpy Enable Setpoint Allow Econ when OA Enthalpy<Spt			17	AV	ReadCOV_Commandable	0.1	40034	Holding	2
Supply_Fan_CFM_Setpoint_BMS	Supply Fan CFM Setpoint			18	AV	ReadCOV_Commandable	0.1	40036	Holding	2
OAD_CFM_Setpoint_BMS	OAD CFM Setpoint			19	AV	ReadCOV_Commandable	0.1	40038	Holding	2
Outside_RH_from_BMS	Outside RH from BMS Used when source selection is set to BMS			21	AV	ReadCOV_Commandable	0.1	40042	Holding	2
Outside_Temp_from_BMS	Outside Temp from BMS Used when source selection is set to BMS			22	AV	ReadCOV_Commandable	0.1	40044	Holding	2
Return_RH_from_BMS	Return RH from BMS Used when source selection is set to BMS			23	AV	ReadCOV_Commandable	0.1	40046	Holding	2
Return_Temp_from_BMS	Return Temp from BMS Used when source selection is set to BMS			24	AV	ReadCOV_Commandable	0.1	40048	Holding	2
Space_1_CO2_from_BMS	Space 1 CO2 from BMS Used when source selection is set to BMS			25	AV	ReadCOV_Commandable	0.1	40050	Holding	2
Space_RH_from_BMS	Space RH from BMS Used when source selection is set to BMS			28	AV	ReadCOV_Commandable	0.1	40056	Holding	2
Space_Static_from_BMS	Space Static from BMS Used when source selection is set to BMS			29	AV	ReadCOV_Commandable	0.1	40058	Holding	2
Space_Temp_from_BMS	Space Temp from BMS Used when source selection is set to BMS			30	AV	ReadCOV_Commandable	0.1	40060	Holding	2
Cooling_Lockout_Setpoint	Cooling Ambient Lockout Setpoint			31	AV	ReadCOV_Commandable	0.1	40062	Holding	2
Heating_Lockout_Setpoint	Heating Ambient Lockout Setpoint			32	AV	ReadCOV_Commandable	0.1	40064	Holding	2
Preheat_Lockout_Setpoint	Preheat Ambient Lockout Setpoint			33	AV	ReadCOV_Commandable	0.1	40066	Holding	2
Space_Static_Pressure_Setpoint	Space Static Pressure Setpoint			37	AV	ReadCOV_Commandable	0.1	40074	Holding	2
Supply_Duct_Static_Pressure_Setpoint	Supply Duct Static Pressure Setpoint			38	AV	ReadCOV_Commandable	0.1	40076	Holding	2
Space_CO2_Setpoint	Space CO2 Setpoint			39	AV	ReadCOV_Commandable	0.1	40078	Holding	2

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Exhaust_Fan_CFM_Setpoint_BMS	Exhaust Fan CFM Setpoint			113	AV	ReadCOV_Commandable	0.1	40080	Holding	2
SF_Control_Signal_BMS	BMS to control signal for supply fan speed			133	AV	ReadCOV_Commandable	0.1	40084	Holding	2
EF_Control_Signal_BMS	BMS to control signal for exhaust fan speed			134	AV	ReadCOV_Commandable	0.1	40086	Holding	2
OAD_Control_Signal_BMS	Allows the BMS to control OAD position			136	AV	ReadCOV_Commandable	0.1	40090	Holding	2
Outside_Air_Damper_Minimum_Setpoint	Outside Air Damper Minimum Setpoint			137	AV	ReadCOV_Commandable	1	40092	Holding	2
Analog Values – Read Only										
Unit_Status_Mode	See Table 13: Unit status mode			40	AV	ReadCOV_NoWrite	0	30002	Input	2
Supply_Temperature_Calculated_Setpoint	Active Supply Temperature Setpoint			41	AV	ReadCOV_NoWrite	0.1	30004	Input	2
Cooling_1_Ramp_Capacity	Cooling Ramp 1 Compressor Capacity			43	AV	ReadCOV_NoWrite	1	30008	Input	2
Defrost_Ramp	Defrost Ramp			47	AV	ReadCOV_NoWrite	1	30016	Input	2
Economizer_Ramp	Economizer Ramp			48	AV	ReadCOV_NoWrite	1	30018	Input	2
Exhaust_Fan_Space_Static_Pressure_Ramp	Exhaust Fan Space Static Pressure Ramp			49	AV	ReadCOV_NoWrite	1	30020	Input	2
Exhaust_Fan_Supply_Tracking_Ramp	Exhaust Fan Supply Tracking Ramp			50	AV	ReadCOV_NoWrite	1	30022	Input	2
Head_Pressure_Control_Ramp_1_Ramp	Head Pressure Control Ramp 1			51	AV	ReadCOV_NoWrite	1	30024	Input	2
Head_Pressure_Control_Ramp_2_Ramp	Head Pressure Control Ramp 2			52	AV	ReadCOV_NoWrite	1	30026	Input	2
HP_Ramp_Capacity	Heat Pump Heating Compressor Capacity			59	AV	ReadCOV_NoWrite	1	30040	Input	2
Heating_Ramp	Heating Ramp			60	AV	ReadCOV_NoWrite	1	30042	Input	2
Hot_Gas_Reheat_Ramp	Hot Gas Reheat Ramp			61	AV	ReadCOV_NoWrite	1	30044	Input	2
OAD_CFM_Ramp	OAD CFM Ramp			64	AV	ReadCOV_NoWrite	1	30050	Input	2
Space_CO2_Control_Ramp	Space CO2 Control Ramp			71	AV	ReadCOV_NoWrite	1	30064	Input	2
Supply_Duct_Static_Pressure_Ramp	Supply Duct Static Pressure Ramp			72	AV	ReadCOV_NoWrite	1	30066	Input	2
Supply_Fan_CFM_Control_Ramp	Supply Fan CFM Control Ramp			73	AV	ReadCOV_NoWrite	1	30068	Input	2
Supply_Fan_Space_Static_Pressure_Ramp	Supply Fan Space Static Pressure Ramp			74	AV	ReadCOV_NoWrite	1	30070	Input	2
Winter_Ramp_Output	Winter Ramp Output			75	AV	ReadCOV_NoWrite	1	30072	Input	2
Outside_Dewpoint	Outside Dewpoint			82	AV	ReadCOV_NoWrite	0.1	30086	Input	2
Outside_Enthalpy	Outside Enthalpy			83	AV	ReadCOV_NoWrite	0.1	30088	Input	2
Space_Dewpoint	Space Dewpoint			88	AV	ReadCOV_NoWrite	0.1	30098	Input	2
Space_Enthalpy	Space Enthalpy			89	AV	ReadCOV_NoWrite	0.1	30100	Input	2
Total_Exhaust_Fan_CFM_BMS	Total Exhaust Fan CFM			107	AV	ReadCOV_NoWrite	10	30136	Input	2
Total_Supply_Fan_CFM_BMS	Total Supply Fan CFM			110	AV	ReadCOV_NoWrite	10	30140	Input	2
OAD_CFM_BMS	OAD CFM_BMS			129	AV	ReadCOV_NoWrite	0.1	30174	Input	2
OAD_Space_Static_Pressure_Ramp	OAD Static Pressure Ramp			131	AV	ReadCOV_NoWrite	1	30178	Input	2
Active_Temperature_Setpoint	Active Temperature Setpoint			132	AV	ReadCOV_NoWrite	0.1	30180	Input	2
Chilled_Water_1_Valve_Analog_Output	Chilled Water 1 Valve Analog Output			201	AV	ReadCOV_NoWrite	0.1	30474	Input	2
Condenser_1_Analog_Output	Condenser 1 Analog Output			205	AV	ReadCOV_NoWrite	0.1	30482	Input	2
Condenser_2_Analog_Output	Condenser 2 Analog Output			206	AV	ReadCOV_NoWrite	0.1	30484	Input	2

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Electric_Heater_1_Analog_Output	Electric Heater 1 Analog Output			221	AV	ReadCOV_NoWrite	0.1	30514	Input	2
Energy_Recovery_Analog_Output	Energy Recovery Analog Output			229	AV	ReadCOV_NoWrite	0.1	30518	Input	2
Exhaust_Fan_Speed_Analog_Output	Exhaust Fan Speed Analog Output			231	AV	ReadCOV_NoWrite	0.1	30522	Input	2
Hot_Gas_Reheat_Analog_Output	Hot Gas Reheat Analog Output			235	AV	ReadCOV_NoWrite	0.1	30524	Input	2
Hot_Water_Valve_1_Analog_Output	Hot Water Valve 1 Analog Output			236	AV	ReadCOV_NoWrite	0.1	30526	Input	2
Mod_Gas_Furnace_1_Analog_Output	Mod Gas Furnace 1 Analog Output			242	AV	ReadCOV_NoWrite	0.1	30538	Input	2
Outside_Air_Damper_Analog_Output	Outside Air Damper Analog Output			250	AV	ReadCOV_NoWrite	0.1	30542	Input	2
Supply_Fan_Speed_Analog_Output	Supply Fan Speed Analog Output			264	AV	ReadCOV_NoWrite	0.1	30558	Input	2
Modulating_Compressor_Analog_Output_BMS	Modulating Compressor Analog Output - Valent BMS			285	AV	ReadCOV_NoWrite	0.1	30586	Input	2
Circuit_A_Sat_Discharge_Temperature	Circuit A Saturated Discharge Temperature			286	AV	ReadCOV_NoWrite	0.1	30588	Input	2
Circuit_B_Sat_Discharge_Temperature	Circuit B Saturated Discharge Temperature			287	AV	ReadCOV_NoWrite	0.1	30590	Input	2
Binary Inputs – Read Only										
Comp_Circ_A_High_Pressure_Digital_Input	Circuit A High Pressure Switch	Alarm	Normal	3	BI	ReadCOV_NoWrite	0	10052	Discrete	
Comp_Circ_A_Low_Pressure_Digital_Input	Circuit A Low Pressure Switch	Alarm	Normal	4	BI	ReadCOV_NoWrite	0	10053	Discrete	
Comp_Circ_B_High_Pressure_Digital_Input	Circuit B High Pressure Switch	Alarm	Normal	5	BI	ReadCOV_NoWrite	0	10054	Discrete	
Comp_Circ_B_Low_Pressure_Digital_Input	Circuit B Low Pressure Switch	Alarm	Normal	6	BI	ReadCOV_NoWrite	0	10055	Discrete	
Controls_Lite_Dehumidification_Request_Digital_Input	Controls Lite Dehumidification Request Status	Dehumidify	Cool	19	BI	ReadCOV_NoWrite	0	10068	Discrete	
Controls_Lite_Cool_Heat_Request_Digital_Input	Controls Lite Cool Heat Request Status	Heating	Cooling	20	BI	ReadCOV_NoWrite	0	10069	Discrete	
Drain_Pan_Alarm_Digital_Input	Drain Pan Alarm Digital Input Status	Alarm	Normal	21	BI	ReadCOV_NoWrite	0	10070	Discrete	
EAD_End_Switch_Digital_Input	Exhaust Air Damper End Switch Digital Input Status	Closed	Open	22	BI	ReadCOV_NoWrite	0	10071	Discrete	
Exhaust_Fan_1_Status_Digital_Input	Exhaust Fan 1 Status	On	Off	23	BI	ReadCOV_NoWrite	0	10072	Discrete	
Freeze_Stat_Alarm_Digital_Input	Freeze Stat Alarm Digital Input Status	Alarm	Normal	28	BI	ReadCOV_NoWrite	0	10077	Discrete	
OAD_End_Switch_Digital_Input	OAD End Switch Digital Input Status	Closed	Open	52	BI	ReadCOV_NoWrite	0	10101	Discrete	
Occupancy_Digital_Input	Occupancy Digital Input Status	Occupied	Unoccupied	53	BI	ReadCOV_NoWrite	0	10102	Discrete	
Outside_Filter_Alarm_Digital_Input	Outside Filter Alarm Digital Input Status	Alarm	Normal	54	BI	ReadCOV_NoWrite	0	10103	Discrete	
Shutdown_Alarm_Digital_Input	Shutdown Alarm Digital Input Status	Alarm	Normal	75	BI	ReadCOV_NoWrite	0	10124	Discrete	
Supply_Fan_1_Status_Digital_Input	Supply Fan 1 Status	On	Off	78	BI	ReadCOV_NoWrite	0	10127	Discrete	
Unit_Enable_Digital_Input	Remote Unit Enable Digital Input Status	Enabled	Disabled	82	BI	ReadCOV_NoWrite	0	10131	Discrete	
Wheel_Status_Digital_Input	Heat Wheel Status	Enabled	Disabled	83	BI	ReadCOV_NoWrite	0	10132	Discrete	

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

TABLE 14-1 BACNET / MODBUS UNIT LIST FOR VENT UNIT										
VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Binary Values – Read/Write – Commandable										
BMS_Watchdog	BMS Watchdog command Used to determine comm status Must heartbeat within the watchdog timeout delay to detect comm status	Active	Inactive	1	BV	Read_ Commandable	0	2	Coil	
System_Enable	Master system enable	Enabled	Disabled	2	BV	Read_ Commandable	0	3	Coil	
BMS_Occupancy_Command	Occupancy Command	Unoccupied	Occupied	3	BV	Read_ Commandable	0	4	Coil	
Reset_All_Alarms	Alarm Reset Command	Reset	Normal	4	BV	Read_ Commandable	0	5	Coil	
Outside_RH_Source_BMS	Outside RH Source Selection	BMS	Local	5	BV	Read_ Commandable	0	6	Coil	
Outside_Temp_Source_BMS	Outside Temp Source Selection	BMS	Local	6	BV	Read_ Commandable	0	7	Coil	
Return_RH_Source_BMS	Return RH Source Selection	BMS	Local	7	BV	Read_ Commandable	0	8	Coil	
Return_Temp_Source_BMS	Return Temp Source Selection	BMS	Local	8	BV	Read_ Commandable	0	9	Coil	
Space_1_CO2_Source_BMS	Space 1 CO2 Source Selection	BMS	Local	9	BV	Read_ Commandable	0	10	Coil	
Space_2_CO2_Source_BMS	Space 2 CO2 Source Selection	BMS	Local	10	BV	Read_ Commandable	0	11	Coil	
Space_RH_Source_BMS	Space RH Source Selection	BMS	Local	12	BV	Read_ Commandable	0	13	Coil	
Space_Static_Source_BMS	Space Static Source Selection	BMS	Local	13	BV	Read_ Commandable	0	14	Coil	
Space_Temp_Source_BMS	Space Temp Source Selection	BMS	Local	14	BV	Read_ Commandable	0	15	Coil	
SF_Control_Source_BMS	Allows the BMS to control supply fan speed	BMS	Local	56	BV	Read_ Commandable	0	18	Coil	
EF_Control_Source_BMS	Allows the BMS to control exhaust fan speed	BMS	Local	57	BV	Read_ Commandable	0	19	Coil	
OAD_Control_Source_BMS	Allows the BMS to control OAD position	BMS	Local	59	BV	Read_ Commandable	0	21	Coil	
Binary Values – Read Only										
Occupied	Occupied Status	Occupied	Unoccupied	16	BV	ReadCOV_NoWrite	0	10002	Discrete	
Unoccupied	Unoccupied Status	Unoccupied	Occupied	17	BV	ReadCOV_NoWrite	0	10003	Discrete	
Unoccupied_Cooling_Call	Unoccupied Cooling Call Status	On	Off	18	BV	ReadCOV_NoWrite	0	10004	Discrete	
Unoccupied_Dehumidification_Call	Unoccupied Dehumidification Call Status	On	Off	19	BV	ReadCOV_NoWrite	0	10005	Discrete	
Unoccupied_Heating_Call	Unoccupied Heating Call Status	On	Off	20	BV	ReadCOV_NoWrite	0	10006	Discrete	
Occupied_Start	Occupied Start Command Status	Start	Stop	21	BV	ReadCOV_NoWrite	0	10007	Discrete	
Unoccupied_Start	Unoccupied Start Command Status	Start	Stop	22	BV	ReadCOV_NoWrite	0	10008	Discrete	
Enable_Controls	Status to indicate startup is complete and the unit is ready	Yes	No	23	BV	ReadCOV_NoWrite	0	10009	Discrete	
Global_Alarm	General alarm point Optionally set to indicate any alarm is active, or a shutdown alarm is active	Alarm	Normal	24	BV	ReadCOV_NoWrite	0	10010	Discrete	
System_Shutdown_Alarm	Shutdown alarm status When true, System Enable will be set to false and the unit will remain off	Alarm	Normal	25	BV	ReadCOV_NoWrite	0	10011	Discrete	

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Damper_Open	Indicates there is a open air path and the supply fan can run	Open	Closed	26	BV	ReadCOV_NoWrite	0	10012	Discrete	
Cooling_is_On	Indicates that the unit is cooling	Yes	No	27	BV	ReadCOV_NoWrite	0	10013	Discrete	
Economizer_is_On	Indicates that the unit is economizing	Yes	No	28	BV	ReadCOV_NoWrite	0	10014	Discrete	
Heating_is_On	Indicates that the unit is heating	Yes	No	29	BV	ReadCOV_NoWrite	0	10015	Discrete	
Dehumidification_Mode_Enabled	Indicates that the unit is dehumidifying	Yes	No	31	BV	ReadCOV_NoWrite	0	10017	Discrete	
Manual_Override_Active	Indicates that manual overrides are active	Active	Inactive	32	BV	ReadCOV_NoWrite	0	10018	Discrete	
Cooling_Not_Locked_Out	Indicates that cooling is allowed	Allowed	Locked Out	33	BV	ReadCOV_NoWrite	0	10019	Discrete	
Heating_Not_Locked_Out	Indicates that heating is allowed	Allowed	Locked Out	34	BV	ReadCOV_NoWrite	0	10020	Discrete	
Preheat_Not_Locked_Out	Indicates that preheat is allowed	Allowed	Locked Out	36	BV	ReadCOV_NoWrite	0	10022	Discrete	
HGRH_Purging	Indicates that the hot gas reheat value is purging	Yes	No	37	BV	ReadCOV_NoWrite	0	10023	Discrete	
Allow_Dampers	Startup sequence command to open dampers	Yes	No	43	BV	ReadCOV_NoWrite	0	10029	Discrete	
Allow_Exhaust_Fans	Startup sequence command to trigger exhaust fans to start	Yes	No	44	BV	ReadCOV_NoWrite	0	10030	Discrete	
Allow_Supply_Fans	Startup sequence command to trigger supply fans to start	Yes	No	48	BV	ReadCOV_NoWrite	0	10034	Discrete	
BMS_Watchdog_Active	Status of the BMS watchdog ping	Active	Inactive	49	BV	ReadCOV_NoWrite	0	10035	Discrete	
BMS_Occupancy_Status	Status of the BMS occupancy command	Unoccupied	Occupied	50	BV	ReadCOV_NoWrite	0	10036	Discrete	
Cond_Water_Pump_Required	WSHP Water Pump Requested	On	Off	60	BV	ReadCOV_NoWrite	0	10042	Discrete	
Damper_Actuator_Power_1_Digital_Output	Damper Actuator Power 1 Digital Output	Active	Inactive	100	BV	ReadCOV_NoWrite	0	10153	Discrete	
Compressor_1_Enable_Digital_Output	Compressor 1 Enable	On	Off	111	BV	ReadCOV_NoWrite	0	10164	Discrete	
Compressor_2_Enable_Digital_Output	Compressor 2 Enable	On	Off	112	BV	ReadCOV_NoWrite	0	10165	Discrete	
Compressor_3_Enable_Digital_Output	Compressor 3 Enable	On	Off	113	BV	ReadCOV_NoWrite	0	10166	Discrete	
Compressor_4_Enable_Digital_Output	Compressor 4 Enable	On	Off	114	BV	ReadCOV_NoWrite	0	10167	Discrete	
Condenser_Fan_1_Digital_Output	Condenser Fan Stage 1	On	Off	119	BV	ReadCOV_NoWrite	0	10172	Discrete	
Condenser_Fan_2_Digital_Output	Condenser Fan Stage 2	On	Off	120	BV	ReadCOV_NoWrite	0	10173	Discrete	
Condenser_Fan_3_Digital_Output	Condenser Fan Stage 3	On	Off	121	BV	ReadCOV_NoWrite	0	10174	Discrete	
Exhaust_Fan_1_Start_Stop_Digital_Output	Exhaust Fan 1 Start Stop	On	Off	127	BV	ReadCOV_NoWrite	0	10180	Discrete	
Furnace_1_Stage_1_Digital_Output	Furnace 1 Stage 1	On	Off	131	BV	ReadCOV_NoWrite	0	10184	Discrete	
Furnace_2_Stage_1_Digital_Output	Furnace 2 Stage 1	On	Off	133	BV	ReadCOV_NoWrite	0	10186	Discrete	
Heat_Wheel_Enable_Digital_Output	Heat Wheel Enable	On	Off	163	BV	ReadCOV_NoWrite	0	10208	Discrete	
PreHeat_Enable_Digital_Output	PreHeat Enable Digital Output	On	Off	166	BV	ReadCOV_NoWrite	0	10211	Discrete	
Reversing_Valve_Digital_Output	Reversing Valve	Heating	Cooling	175	BV	ReadCOV_NoWrite	0	10220	Discrete	
Supply_Fan_1_Start_Stop_Digital_Output	Supply Fan 1 Start	Start	Stop	186	BV	ReadCOV_NoWrite	0	10231	Discrete	
Bacnet_License_not_Installed_Alarm_Active	Bacnet License not Installed Alarm	Alarm	Normal	300	BV	ReadCOV_NoWrite	0	10251	Discrete	
BMS_Offline_Alarm.Active	BMS Offline Alarm	Alarm	Normal	313	BV	ReadCOV_NoWrite	0	10264	Discrete	
Cold_Coil_1_Temperature_Sensor_Alarm_Active	Cold Coil 1 Temperature Sensor Alarm	Alarm	Normal	387	BV	ReadCOV_NoWrite	0	10338	Discrete	

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Comp_Circ_A_High_Pressure_Alarm.Active	Comp Circ A High Pressure Alarm	Alarm	Normal	395	BV	ReadCOV_NoWrite	0	10346	Discrete	
Comp_Circ_A_Low_Pressure_Alarm.Active	Comp Circ A Low Pressure Alarm	Alarm	Normal	396	BV	ReadCOV_NoWrite	0	10347	Discrete	
Comp_Circ_B_High_Pressure_Alarm.Active	Comp Circ B High Pressure Alarm	Alarm	Normal	397	BV	ReadCOV_NoWrite	0	10348	Discrete	
Comp_Circ_B_Low_Pressure_Alarm.Active	Comp Circ B Low Pressure Alarm	Alarm	Normal	398	BV	ReadCOV_NoWrite	0	10349	Discrete	
Comp_Maintenance_Alarm.Active	Comp Maintenance Alarm	Alarm	Normal	411	BV	ReadCOV_NoWrite	0	10362	Discrete	
Damper_End_Switch_Alarm.Active	Damper End Switch Alarm	Alarm	Normal	420	BV	ReadCOV_NoWrite	0	10371	Discrete	
Drain_Pan_Alarm.Active	Drain Pan Alarm	Alarm	Normal	422	BV	ReadCOV_NoWrite	0	10372	Discrete	
Exhaust_Fan_1_Alarm.Active	Exhaust Fan 1 Alarm	Alarm	Normal	423	BV	ReadCOV_NoWrite	0	10373	Discrete	
Exhaust_Fan_1_CFM_Analog_Input_Alarm.Active	Exhaust Fan 1 CFM Analog Input Alarm	Alarm	Normal	424	BV	ReadCOV_NoWrite	0	10374	Discrete	
Exhaust_Temperature_Sensor_Alarm.Active	Exhaust Temperature Sensor Alarm	Alarm	Normal	433	BV	ReadCOV_NoWrite	0	10383	Discrete	
Expansion_Board_1_Alarm.Active	Expansion Board 1 Alarm	Alarm	Normal	434	BV	ReadCOV_NoWrite	0	10384	Discrete	
Expansion_Board_2_Alarm.Active	Expansion Board 2 Alarm	Alarm	Normal	435	BV	ReadCOV_NoWrite	0	10385	Discrete	
Expansion_Board_3_Alarm.Active	Expansion Board 3 Alarm	Alarm	Normal	436	BV	ReadCOV_NoWrite	0	10386	Discrete	
Freeze_Stat_Alarm.Active	Freeze Stat Alarm	Alarm	Normal	441	BV	ReadCOV_NoWrite	0	10391	Discrete	
Internal_Board_Temp_Alarm.Active	Internal Board Temp Alarm	Alarm	Normal	498	BV	ReadCOV_NoWrite	0	10448	Discrete	
Mixed_Temperature_Sensor_Alarm.Active	Mixed Temperature Sensor Alarm	Alarm	Normal	502	BV	ReadCOV_NoWrite	0	10452	Discrete	
Multi_Channel_Conf_Alarm.Active	Multi Channel Conf Alarm	Alarm	Normal	503	BV	ReadCOV_NoWrite	0	10453	Discrete	
OAD_CFM_Analog_Input_Alarm.Active	OAD CFM Analog Input Alarm	Alarm	Normal	506	BV	ReadCOV_NoWrite	0	10456	Discrete	
Outside_Air_Temperature_Sensor_Alarm.Active	Outside Air Temperature Sensor Alarm	Alarm	Normal	507	BV	ReadCOV_NoWrite	0	10457	Discrete	
Outside_Filter_Alarm.Active	Outside Filter Alarm	Alarm	Normal	508	BV	ReadCOV_NoWrite	0	10458	Discrete	
Outside_RH_Sensor_Alarm.Active	Outside RH Sensor Alarm	Alarm	Normal	509	BV	ReadCOV_NoWrite	0	10459	Discrete	
Return_RH_Sensor_Alarm.Active	Return RH Sensor Alarm	Alarm	Normal	532	BV	ReadCOV_NoWrite	0	10482	Discrete	
Return_Temperature_Sensor_Alarm.Active	Return Temperature Sensor Alarm	Alarm	Normal	533	BV	ReadCOV_NoWrite	0	10483	Discrete	
Leaving_Water_Temp_1_Alarm.Active	Return Water Temp Alarm	Alarm	Normal	534	BV	ReadCOV_NoWrite	0	10484	Discrete	
Space_CO2_1_Analog_Input_Alarm.Active	Space CO2 1 Analog Input Alarm	Alarm	Normal	535	BV	ReadCOV_NoWrite	0	10485	Discrete	
Space_High_Static_Alarm.Active	Space High Static Alarm	Alarm	Normal	537	BV	ReadCOV_NoWrite	0	10487	Discrete	
Space_RH_Sensor_Alarm.Active	Space RH Sensor Alarm	Alarm	Normal	538	BV	ReadCOV_NoWrite	0	10488	Discrete	
Space_Setpoint_Slider_Alarm.Active	Space Setpoint Slider Alarm	Alarm	Normal	539	BV	ReadCOV_NoWrite	0	10489	Discrete	
Space_Static_Pressure_Analog_Input_Alarm.Active	Space Static Pressure Analog Input Alarm	Alarm	Normal	540	BV	ReadCOV_NoWrite	0	10490	Discrete	
Space_Temperature_Sensor_Alarm.Active	Space Temperature Sensor Alarm	Alarm	Normal	541	BV	ReadCOV_NoWrite	0	10491	Discrete	
Shutdown_Input_Alarm.Active	Shutdown Input Alarm	Alarm	Normal	546	BV	ReadCOV_NoWrite	0	10496	Discrete	
Supply_Air_Temp_Low_Limit.Active	Supply Air Temp Low Limit Alarm	Alarm	Normal	551	BV	ReadCOV_NoWrite	0	10501	Discrete	
Supply_Air_Temperature_Sensor_Alarm.Active	Supply Air Temperature Sensor Alarm	Alarm	Normal	552	BV	ReadCOV_NoWrite	0	10502	Discrete	
Supply_Duct_Static_Pressure_Analog_Input_Alarm.Active	Supply Duct Static Pressure Analog Input Alarm	Alarm	Normal	553	BV	ReadCOV_NoWrite	0	10503	Discrete	
Supply_Fan_1_Alarm.Active	Supply Fan 1 Alarm	Alarm	Normal	554	BV	ReadCOV_NoWrite	0	10504	Discrete	
Supply_Fan_1_CFM_Analog_Input_Alarm.Active	Supply Fan 1 CFM Analog Input Alarm	Alarm	Normal	558	BV	ReadCOV_NoWrite	0	10508	Discrete	
Supply_High_Duct_Static_Alarm.Active	Supply High Duct Static Alarm	Alarm	Normal	563	BV	ReadCOV_NoWrite	0	10513	Discrete	

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Supply_RH_Sensor_Alarm.Active	Supply RH Sensor Alarm	Alarm	Normal	564	BV	ReadCOV_NoWrite	0	10514	Discrete	
Supply_Temp_High_Limit_Alarm.Active	Supply Temp High Limit Alarm	Alarm	Normal	565	BV	ReadCOV_NoWrite	0	10515	Discrete	
Entering_Water_Temp_1_Alarm.Active	Entering Water Temp Alarm	Alarm	Normal	566	BV	ReadCOV_NoWrite	0	10516	Discrete	
TMem_Error.Active	TMem Error Alarm	Alarm	Normal	567	BV	ReadCOV_NoWrite	0	10517	Discrete	
Wheel_Rotation_Alarm.Active	Wheel Rotation Alarm	Alarm	Normal	576	BV	ReadCOV_NoWrite	0	10526	Discrete	
AI_Batt_EVD_1.Active	EVD Battery Alarm	Alarm	Normal	589	BV	ReadCOV_NoWrite	0	10539	Discrete	
AI_ConfigErr_EVD_1.Active	EVD Configuration Alarm	Alarm	Normal	590	BV	ReadCOV_NoWrite	0	10540	Discrete	
AI_DscgHiP_COMP.Active	Compressor Envelope - High Discharge Pressure Alarm	Alarm	Normal	591	BV	ReadCOV_NoWrite	0	10541	Discrete	
AI_DscgHiTemp_COMP.Active	Compressor Envelope - High Discharge Temperature Alarm	Alarm	Normal	592	BV	ReadCOV_NoWrite	0	10542	Discrete	
AI_DscgLowP_COMP.Active	EVD Low Discharge Pressure Alarm	Alarm	Normal	593	BV	ReadCOV_NoWrite	0	10543	Discrete	
AI_EEPROM_EVD_1.Active	EVD EEPROM Alarm	Alarm	Normal	594	BV	ReadCOV_NoWrite	0	10544	Discrete	
AI_EEV_A_EVD_1.Active	ExV Motor Alarm - Valve A	Alarm	Normal	595	BV	ReadCOV_NoWrite	0	10545	Discrete	
AI_EmergencyClosing_EVD_1.Active	EVD Emergency Closing Alarm	Alarm	Normal	597	BV	ReadCOV_NoWrite	0	10547	Discrete	
AI_EVD_Offline_EVD_1.Active	EVD Offline Communication Alarm	Alarm	Normal	598	BV	ReadCOV_NoWrite	0	10548	Discrete	
AI_FW_CompatibErr_EVD_1.Active	EVD Firmware Compatibility Alarm	Alarm	Normal	599	BV	ReadCOV_NoWrite	0	10549	Discrete	
AI_HiCurr_COMP.Active	Compressor Envelope - High Current Alarm	Alarm	Normal	600	BV	ReadCOV_NoWrite	0	10550	Discrete	
AI_HiRatioP_COMP.Active	Compressor Envelope - High Pressure Ratio Alarm	Alarm	Normal	601	BV	ReadCOV_NoWrite	0	10551	Discrete	
AI_HiT_Cond_EVD_1.Active	AI_HiT_Cond_EVD_1	Alarm	Normal	602	BV	ReadCOV_NoWrite	0	10552	Discrete	
AI_IncompleteClosing_EVD_1.Active	EVD Incomplete Closing Alarm	Alarm	Normal	603	BV	ReadCOV_NoWrite	0	10553	Discrete	
AI_LOP_A_EVD_1.Active	EVD Low Operating Pressure Alarm - Valve A	Alarm	Normal	604	BV	ReadCOV_NoWrite	0	10554	Discrete	
AI_Low_SH_A_EVD_1.Active	EVD Low SuperHeat Alarm - Circuit A	Alarm	Normal	606	BV	ReadCOV_NoWrite	0	10556	Discrete	
AI_LowDeltaP_COMP.Active	Compressor Envelope - Low Pressure DeltaAlarm	Alarm	Normal	608	BV	ReadCOV_NoWrite	0	10558	Discrete	
AI_LowRatioP_COMP.Active	Compressor Envelope - Low Pressure Ratio Alarm	Alarm	Normal	609	BV	ReadCOV_NoWrite	0	10559	Discrete	
AI_LowSuct_A_EVD_1.Active	Low Suction Refrigerant Temperature - Circuit A	Alarm	Normal	610	BV	ReadCOV_NoWrite	0	10560	Discrete	
AI_MOP_A_EVD_1.Active	EVD Max Operating Pressure Alarm - Valve A	Alarm	Normal	612	BV	ReadCOV_NoWrite	0	10662	Discrete	
AI_S1_EVD_1.Active	EVD-S1 Suction Pressure Sensor Alarm	Alarm	Normal	614	BV	ReadCOV_NoWrite	0	10564	Discrete	
AI_S2_EVD_1.Active	EVD-S2 Suction Temperature Sensor Alarm	Alarm	Normal	615	BV	ReadCOV_NoWrite	0	10565	Discrete	
AI_S4_EVD_1.Active	EVD-S4 Discharge Temperature Sensor Alarm	Alarm	Normal	617	BV	ReadCOV_NoWrite	0	10567	Discrete	
AI_SuctHiP_COMP.Active	Compressor Envelope - SuctHiP_COMP	Alarm	Normal	618	BV	ReadCOV_NoWrite	0	10568	Discrete	
AI_SuctLowP_COMP.Active	Compressor Envelope - SuctLowP_COMP	Alarm	Normal	619	BV	ReadCOV_NoWrite	0	10569	Discrete	
High_Ent_Water_Temp_CircA.Active	High Entering Water Temp Alarm - Circuit A	Alarm	Normal	620	BV	ReadCOV_NoWrite	0	10570	Discrete	
High_Ent_Water_Temp_CircB.Active	High Entering Water Temp Alarm - Circuit B	Alarm	Normal	621	BV	ReadCOV_NoWrite	0	10571	Discrete	

TABLE 12: BACNET / MODBUS POINTS LIST FOR VALENT UNITS

VARIABLE	DESCRIPTION	ACTIVE TEXT	INACTIVE TEXT	BACNET				MODBUS		
				OBJECT INSTANCE	OBJECT TYPE	ACCESS	HYST	INDEX	REGISTER TYPE	SIZE
Low_Ent_Water_Temp_CircA.Active	Low Entering Water Temp Alarm - Circuit A	Alarm	Normal	623	BV	ReadCOV_NoWrite	0	10573	Discrete	
Low_Ent_Water_Temp_CircB.Active	Low Entering Water Temp Alarm - Circuit B	Alarm	Normal	624	BV	ReadCOV_NoWrite	0	10574	Discrete	
Return_Water_Temp_2_Alarm.Active	Return Water Temp 2 Alarm	Alarm	Normal	626	BV	ReadCOV_NoWrite	0	10576	Discrete	
Supply_Water_Temp_2_Alarm.Active	Supply Water Temp 2 Alarm	Alarm	Normal	627	BV	ReadCOV_NoWrite	0	10577	Discrete	
Water_Leak_Detector_Alarm.Active	Water Leak Detector Alarm	Alarm	Normal	628	BV	ReadCOV_NoWrite	0	10578	Discrete	
HP_Defrost_Active.Active	Heat Pump Defrost Alarm	Alarm	Normal	631	BV	ReadCOV_NoWrite	0	10579	Discrete	
Comp_Staging_Order_Skipped.Active	Compressor Staging Order is Skipped Warning	Alarm	Normal	632	BV	ReadCOV_NoWrite	0	10580	Discrete	
Heat_Pump_Heating_Lock_Out_Alarm.Active	Heat Pump Heating Locked Out Alarm	Alarm	Normal	633	BV	ReadCOV_NoWrite	0	10581	Discrete	
EVD_PrePosition_Alarm.Active	Unexpected EEV Position	Alarm	Normal	634	BV	ReadCOV_NoWrite	0	10582	Discrete	
Integer Values – Read Only										
Allow_Fan_Delay_Remaining	Startup Sequence Fan Damper Delay Time before enabling Fan startup sequence			1	IV	ReadCOV_NoWrite	1	30182	Input	2
Supply_Fan_Delay_Remaining	Supply Fan startup sequence Time before starting supply fan			2	IV	ReadCOV_NoWrite	1	30184	Input	2
Exhaust_Fan_Delay_Remaining	Exhaust Fan startup sequence Time before starting exhaust fan			3	IV	ReadCOV_NoWrite	1	30186	Input	2
LatestAlm	Most recent alarm See alarm table			7	IV	ReadCOV_NoWrite	1	30194	Input	2

UNIT STATUS MODE

TABLE 13: UNIT STATUS MODE

0	Off/Standby	16	Emergency Exhaust
1	Unoccupied Start	17	Emergency Purge
2	Occupied Start	18	Unassigned
3	Opening Dampers	19	Fans Only
4	End Switch	20	Economizing
5	Dampers Open	21	Cooling
6	Fan Start Delay	22	Heating
7	Fans Starting	23	Dehumidifying
8	Fans Starting	24	Humidifying
9	Heat/Cool Delay	25	HGRH Purging
10	System On	26	Defrost Active
11	Soft Shutdown	27	Pool Purge
12	System Disabled	28	Cooling & Heating
13	Remote Off	29	Dehum w/Heat
14	Shutdown Alarm	30	Overrides Active
15	Emergency Pressurization	31	Expansion Offline

LONTALK POINTS LIST

TABLE 14: LONTALK POINTS LIST				
ACCESS	NV NAME	SNVT TYPE	DESCRIPTION	NOTES
Read-Only Points				
nvo	LatestAlm	count (8)	Most recent alarm	See Table 11: Alarms data
nvo	UnitStatus	count (8)	Startup and Operation Information	See Table 13: Unit status mode
nvo	ExhCFM	flow_p (161)	Total Exhaust Fan CFM	Multiply by 100 for cfm.
nvo	OACFM	flow_p (161)	OAD CFM	Multiply by 100 for cfm.
nvo	SupCFM	flow_p (161)	Total Supply Fan CFM	Multiply by 100 for cfm.
nvo	CoolingRamp1	lev_percent (81)	Cooling Ramp 1 Status Value	Compressor Capacity
nvo	CWV1Out	lev_percent (81)	Chilled Water 1 Valve Analog Output	
nvo	ElecHeat1Out	lev_percent (81)	Electric Heater 1 Analog Output	
nvo	ERecoveryOut	lev_percent (81)	Energy Recovery Analog Output	
nvo	ExhFan1Out	lev_percent (81)	Exhaust Fan Speed Analog Output	
nvo	HeatingRamp	lev_percent (81)	Heating Ramp	
nvo	HGR0ut	lev_percent (81)	Hot Gas Reheat Analog Output	
nvo	HPumpHeatRamp	lev_percent (81)	Heat Pump Heating Ramp	Compressor Capacity
nvo	HWV1Out	lev_percent (81)	Hot Water Valve 1 Analog Output	
nvo	ModCompOutBMS	lev_percent (81)	Modulating Compressor Analog Output BMS	
nvo	ModFurn1Out	lev_percent (81)	Mod Gas Furnace 1 Analog Output	
nvo	OADOutput	lev_percent (81)	Outside Air Damper Analog Output	
nvo	OutsideRH	lev_percent (81)	Outside % Relative Humidity	
nvo	SpaceRH	lev_percent (81)	Space % Relative Humidity	
nvo	SupFan1Out	lev_percent (81)	Supply Fan Speed Analog Output	
nvo	Space1CO2	ppm (29)	Space 1 CO2 ppm	
nvo	SpacePress	press_p (113)	Space Static Pressure	
nvo	SupDuctPress	press_p (113)	Supply Duct Static Pressure	
nvo	DigAlarms	state (83)	Digital Alarm States	16 bit packed
nvo	DigAlarms.bit00	state.bit00	Circuit A High Pressure Switch	0=Normal 1=Alarm
nvo	DigAlarms.bit01	state.bit01	Circuit A Low Pressure Switch	0=Normal 1=Alarm
nvo	DigAlarms.bit02	state.bit02	Circuit B High Pressure Switch	0=Normal 1=Alarm
nvo	DigAlarms.bit03	state.bit03	Circuit B Low Pressure Switch	0=Normal 1=Alarm
nvo	DigAlarms.bit04	state.bit04	Drain Pan Alarm	0=Normal 1=Alarm
nvo	DigAlarms.bit05	state.bit05	Freeze Stat Alarm	0=Normal 1=Alarm
nvo	DigAlarms.bit06	state.bit06	Outside Filter Alarm (Dirty Filter)	0=Normal 1=Alarm
nvo	DigAlarms.bit07	state.bit07	Shutdown alarm status	0=Normal 1=Alarm
nvo	DigStatus	state (83)	Digital Status States	16 bit packed
nvo	DigStatus.bit00	state.bit00	Compressor 1 Enable Digital Output	0=Off 1=On
nvo	DigStatus.bit01	state.bit01	Compressor 2 Enable Digital Output	0=Off 1=On
nvo	DigStatus.bit02	state.bit02	Compressor 3 Enable Digital Output	0=Off 1=On
nvo	DigStatus.bit03	state.bit03	Compressor 4 Enable Digital Output	0=Off 1=On
nvo	DigStatus.bit04	state.bit04	Condenser Fan 1 Digital Output	0=Off 1=On
nvo	DigStatus.bit05	state.bit05	Condenser Fan 2 Digital Output	0=Off 1=On
nvo	DigStatus.bit06	state.bit06	Condenser Fan 3 Digital Output	0=Off 1=On
nvo	DigStatus.bit07	state.bit07	Furnace 1 Stage 1 Digital Output	0=Off 1=On
nvo	DigStatus.bit08	state.bit08	Furnace 2 Stage 1 Digital Output	0=Off 1=On

TABLE 14: LONTALK POINTS LIST				
ACCESS	NV NAME	SNVT TYPE	DESCRIPTION	NOTES
nvo	DigStatus.bit09	state.bit09	Supply Fan Status	0=Off 1=On
nvo	DigStatus.bit10	state.bit10	Exhaust Fan Status	0=Off 1=On
nvo	DigStatus.bit11	state.bit11	Heat Wheel Status	0=Off 1=On
nvo	DigStatus.bit12	state.bit12	PreHeat Enable Digital Output	0=Off 1=On
nvo	DigStatus.bit13	state.bit13	Reversing Valve Digital Output	0=Cooling 1=Heating
nvo	DigStatus.bit14	state.bit14	Occupied Status	0=Unoccupied 1=Occupied
nvo	DigStatus.bit15	state.bit15	Damper Status (OAD or RAD indicating a path of airflow)	0=Closed 1=Open
nvo	GlobalAlarm	switch (95)	General alarm output	0=No Alarms 1=Active Alarms
nvo	ActTmpSpt	temp_p (105)	Active Temperature Setpoint	Heating or Cooling Setpoint
nvo	CirA_SatDschT	temp_p (105)	Circuit A Saturated Discharge Temperature	
nvo	CirB_SatDschT	temp_p (105)	Circuit B Saturated Discharge Temperature	
nvo	ColdCoilTemp	temp_p (105)	Cold Coil Temperature	
nvo	EntWterTempA	temp_p (105)	Leaving Water Temperature Circuit A	
nvo	EntWterTempB	temp_p (105)	Leaving Water Temperature Circuit B	
nvo	ExhaustTemp	temp_p (105)	Exhaust Temperature	
nvo	LeavWterTempA	temp_p (105)	Entering Water Temperature Circuit A	
nvo	LeavWterTempB	temp_p (105)	Entering Water Temperature Circuit B	
nvo	MixedTemp	temp_p (105)	Mixed Temperature	
nvo	OutsideTemp	temp_p (105)	Outside Air Temperature	
nvo	SpaceTemp	temp_p (105)	Space Temperature	
nvo	SupplyTemp	temp_p (105)	Supply Temperature	
Write-Only Points				
nvi	EconEnthTrig	enthalpy (153)	Economizer Enthalpy Enable Setpoint	Allow Econ when OA Enthalpy<Spt
nvi	ExhCFMSetpt	flow_p (161)	Exhaust Fan CFM Setpoint	Divide desired cfm by 100.
nvi	OACFMSetpt	flow_p (161)	OAD CFM Setpoint	Divide desired cfm by 100.
nvi	SupCFMSetpt	flow_p (161)	Supply Fan CFM Setpoint	Divide desired cfm by 100.
nvi	DehumSetpt	lev_percent (81)	Dehumidification Setpoint	%RH for Space or Return control
nvi	OADMInSetpt	lev_percent (81)	Outside Air Damper Minimum Setpoint	
nvi	UnocRHSetpt	lev_percent (81)	Unoccupied Dehumidification %RH Setpoint	
nvi	SpaceCO2Setpt	ppm (29)	Space CO2 Setpoint	
nvi	SpacePressSpt	press_p (113)	Space Static Pressure Setpoint	
nvi	SupPressSetpt	press_p (113)	Supply Duct Static Pressure Setpoint	
nvi	OccUnocc	switch (95)	Occupancy Command	0=Occupied 1=Unoccupied
nvi	ResetAlarms	switch (95)	Alarm Reset Command	
nvi	SystemEnable	switch (95)	Master system enable/disable point	
nvi	TempDeadband	temp_diff_p (147)	Heat/Cool Spt Deadband (Space or Return control is active)	Divided by 2 Add/subtract to/from the setpoint
nvi	EconTempTrig	temp_p (105)	Economizer Ambient Temp Enable Setpoint	Allow Econ when OAT<Spt
nvi	lADewptTrig	temp_p (105)	Inside Dewpoint Dehumidification Setpoint	
nvi	TempSetpt	temp_p (105)	Main Temperature Setpoint	Supply, Space, or Return target
nvi	UnocCoolSetpt	temp_p (105)	Unoccupied Cooling Setpoint	
nvi	UnocHeatSetpt	temp_p (105)	Unoccupied Heating Setpoint	

CONTACT US / MORE INFORMATION

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VALENT AND INNOVENT TECHNICAL SUPPORT AND SERVICE

800-789-8550

Valent: support@doas.com

Innovent: support@innoventair.com

Innovent Air Handling Equipment

Valent Dedicated Outdoor Air Systems

60-28th Avenue North

Minneapolis, MN 55411

Main: 612-877-4800

MORE INFORMATION

UNIT SCHEMATICS

For configuration and connection questions, see the schematics that shipped with your unit. They can typically be found attached to the main control panel door.

MECHANICAL AND CONTROLS MANUALS

Go to the literature section of your air handler's web site to find current mechanical and controls manuals:

Valent units: www.valentair.com

Innovent units: www.innoventair.com



Continuous product improvement is a policy of Valent and Innovent; therefore, product functionality and specifications are subject to change without notice. For the most recent product information visit our product web sites.

Valent VPR Series and
Innovent Controls IOM
Part number: 482934
October 26, 2020