VERTICAL UNIT VENTS (Typical of 8)



<u>Unit Ventilator</u> (typical of 8)

General:

The vertical unit vents shall be provided with factory mounted controls and shall perform the operational sequence. The factory controls shall be BACnet compatible and interface with the BAS.

- **<u>Run Conditions</u>** Occupied and Unoccupied Modes System shall utilize two modes of operation. •
- Occupied Mode: If EMS schedule is active then unit shall be 'Occupied'. • Unoccupied Mode: If EMS schedule is not active then unit shall be 'Unoccupied'.
- Occupied Mode: The unit shall maintain • • A 74°F (adj.) cooling setpoint
- A 70°F (adj.) heating setpoint. Unoccupied Mode (night setback): The unit shall maintain •
- A 80°F (adj.) cooling setpoint. A 60°F (adj.) heating setpoint.
- Alarms shall be provided as follows:

 High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.). • Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

Zone Setpoint Adjust:

The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Zone Unoccupied Override A timed local override control shall allow an occupant to override the schedule and place the unit into an occupied mode for an adjustable period of time. At the expiration of this time, control of the unit shall automatically return to the schedule.

Freeze Protection The unit shall shut down and generate an alarm upon receiving a freezestat status.

Fan: The fan shall run anytime the unit is commanded to run, unless shutdown on safeties. The fan speeds shall be indexed as follows: • Low speed shall run anytime the zone temperature is within setpoints. • High speed shall run anytime the zone temperature is outside of setpoints or unit is in

Morning WarmUp. Cooling Stages:

The controller shall measure the zone temperature and stage the cooling to maintain its cooling setpoint. To prevent short cycling, there shall be a user definable (adj.) delay between stages, and each stage shall have a user definable (adj.) minimum runtime.

- The cooling shall be enabled whenever: Outside air temperature is greater than 60°F (adj.).
- AND the economizer is disabled or fully open. AND the zone temperature is above cooling setpoint. •
- AND the supply fan status is on. • • AND the heating is not active.
- Heating Coil Valve: The controller shall measure the zone temperature and modulate the heating coil valve to
- maintain its heating setpoint. The heating shall be enabled whenever: Outside air temperature is less than 60°F (adj.) and Winter Mode (Global) is active. •
- AND the zone temperature is below heating setpoint. • AND the fan is on. The heating coil valve shall open whenever the unit is in Morning WarmUp.
- The heating coil valve shall open whenever the freezestat (if present) is on.

Economizer (ASHRAE Cycle II): The controller shall measure the zone temperature and modulate the mixed air dampers in sequence to maintain the zone cooling setpoint. The outside air dampers shall maintain a minimum adjustable position of 20% (adj.) open during heating and ventilation whenever

- occupied The economizer shall be enabled whenever: Outside air temperature is at least 3°F (adj.) less than the Zone Temperature. •
- AND the outside air temperature is less than 75°F (adj.) • The economizer shall close whenever the freezestat (if present) is on.
- The outside air dampers shall close and the return air damper shall open when the unit is off. If Optimal Start Up is available the mixed air damper shall operate as described in the occupied mode except that the outside air damper shall modulate to fully closed. The controller shall monitor the discharge air temperature. Should discharge temperature drop below a user definable temperature (adj.), the controller shall enable the heating, close the outside damper and open the return damper.

operation as CO2 concentrations rise from 750ppm to 800ppm (adj.) and above. Discharge Air Temperature: The controller shall monitor the discharge air temperature. Alarms shall be provided as follows: High Discharge Air Temp: If the discharge air temperature is greater than 120°F (adj.). Low Discharge Air Temp: If the discharge air temperature is less than 40°F (adj.).

Fan Status: The controller shall monitor the fan status. Alarms shall be provided as follows:

Fan Failure: Commanded on, but the status is off. Fan in Hand: Commanded off, but the status is on. Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.). Zone Carbon Dioxide (CO2) Concentration Monitoring: The controller shall measure the zone CO2 levels. Alarms shall be provided as follows: • High Zone Carbon Dioxide Concentration: If the zone CO2 concentration is greater than 1000ppm (adj.) when in the occupied mode.

	Ha	rdwar	e Poi	nts	Software Points						
Point Name	AI	AO	Ы	во	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Zone Temp					х				х		х
Zone Setpoint Adjust					х						х
Discharge Air Temp					х				х		х
Zone Carbon Dioxide PPM					х				х		х
Heating Valve					х				х		х
Mixed Air Dampers					х				х		х
DX Stage 1 Command						х					
Zone Override						х			x		х
Fan Status						х			x		х
Fan Start/Stop						х			х		х
Relief Hood Dampers						х			х		х
Intake Hood Dampers						х			x		х
Zone Carbon Dioxide PPM Setpoint					х				x		х
Schedule								x			

Vertical Unit Vents (typical of 8)

<u>Unit</u>	name:		
•	WESVUV-1	CLASSROOM	D115/D113
•	WESVUV-2	CLASSROOM	D119/D117
•	WESVUV-3	CLASSROOM	D121
•	WESVUV-4	CLASSROOM	D126
•	WESVUV-5	CLASSROOM	D116/D114
•	WESVUV-6	CLASSROOM	D118
•	WESVUV-7	CLASSROOM	D105 - ALT



Minimum Outside Air Ventilation - Carbon Dioxide (CO2) Control: When in the occupied mode, the controller shall measure the zone CO2 levels and open the outside air dampers on rising CO2 concentrations, overriding normal damper

F DEDUCT WESVUV-8 CLASSROOM D108 – ALT DEDUCT

<u>RTU</u> (typical of 1)

OA

Run Conditions - Scheduled: The unit shall run according to a user definable time schedule in the following modes:

The unit shall shut down and generate an alarm upon receiving a freezestat status.

prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime.

The controller shall measure the zone temperature and modulate the heating coil valve to

• Outside air temperature is less than 60°F (adj.) and Winter Mode (Global) is on.

Supply Fan Failure: Commanded on, but the status is off.

each stage shall have a user definable (adj.) minimum runtime.

Outside air temperature is greater than 60°F (adj.).

AND the zone temperature is above cooling setpoint.

AND the zone temperature is below heating setpoint.

The heating coil valve shall open whenever the freezestat is on.

AND the economizer is disabled or fully open.

Supply Fan in Hand: Commanded off, but the status is on.

N.C.

- Occupied Mode: The unit shall maintain
- A 74°F (adj.) cooling setpoint
- A 70°F (adj.) heating setpoint.

- Unoccupied Mode (night setback): The unit shall maintain

- A 80°F (adj.) cooling setpoint.

- A 60°F (adj.) heating setpoint.

Alarms shall be provided as follows:

definable amount (adj.).

definable amount (adj.).

Zone Optimal Start:

Snow Day Shutdown:

Freeze Protection:

status.

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Economizer:

occupied.

Supply Fan:

Cooling Stages:

Heating Coil Valve:

maintain its heating setpoint.

of scheduled occupied period.

Return Air Smoke Detection:

Supply Air Smoke Detection:

Alarms shall be provided as follows:

The cooling shall be enabled whenever:

The heating shall be enabled whenever:

AND the supply fan status is on.

AND the supply fan status is on.

AND the cooling is not active.

The economizer shall be enabled whenever:

• AND the supply fan status is on.

The economizer shall close whenever:

• OR on loss of supply fan status. • OR the freezestat (if present) is on.

• Outside air temperature is less than 65°F (adj.).

• Mixed air temperature drops from 40°F to 35°F (adj.).

occupied mode except that the outside air damper shall modulate to fully closed.

AND the heating is not active.



The outside and exhaust air dampers shall close and the return air damper shall open when the unit is off. If Optimal Start Up is available the mixed air damper shall operate as described in the