

BACnet Programmable TEC Unit Vent Controller for Smoke Control



The BACnet PTEC Unit Vent Controller is an integral part of BACnet network. The controller provides high performance Direct Digital Control (DDC) technology for room temperature control in unit ventilators. The Unit Vent Controller and related components provide an electronic control system.

The BACnet PTEC can operate stand-alone or can be networked to perform complex HVAC control, monitoring and energy management functions and is designed to reside on any BACnet control system.

Features

- UL864 Listed for Smoke Control
- Communicates using BACnet MS/TP protocol for open communications on BACnet MS/TP networks.
- BTL listed as a B-ASC device.
- Auto-discovery and Auto-addressing over entire MS/TP network.
- Programmable using PPCL.
- Setpoints and control parameters assigned and changed locally or remotely.

- Setpoints and control parameters stored in Electrically Erasable Programmable Read Only Memory (EEPROM)—no battery backup required.
- Returns from power failure without operator intervention.
- No calibration required, thereby reducing maintenance costs.
- Advanced digital room unit for temperature, CO₂, and relative humidity.
- Supports analog or digital room units with either absolute or warmer-cooler setpoint adjustments.
- Includes a user-adjustable temperature offset for the room temperature reading when required for validation purposes.
- PID control of HVAC systems minimizes offset and maintains tighter setpoint control.
- Unique control algorithms for specific applications.
- Control capable of modulating 0-10V valve actuators and damper actuators.
- Optional Temperature Offset.

Applications

- Heating and/or Chilled Water Cooling, ASHRAE Cycles I and II (Application 6675)
- Heating and/or Chilled Water Cooling, ASHRAE Cycle III (Application 6676)
- Heating and DX Cooling, ASHRAE Cycles I and II (Application 6677)
- Heating and DX Cooling, ASHRAE Cycle III (Application 6678)

- Nesbitt Cycle W (Application 6679)

Heating can be provided by hot water, steam or electric heat while cooling can be chilled water or DX coils.

Control algorithms are pre-programmed. The controller is ready to operate after selecting the application. If desired, the operator may adjust the room temperature setpoints and other parameters. The controller is designed for operation and modification without vendor assistance.

If required, new custom code using PPCL programming language can be added to replace or supplement the standard application residing in the controller. This provides the flexibility to meet many job specifications with the assurance of having a proven and tested standard application to rely upon.

Hardware

Controller Board

The BACnet PTEC Unit Vent Controller consists of an electronic controller assembly.

This controller provides all wiring terminations for system and local communication and power. The cable from the room sensor (purchased separately) connects to an RJ-11 jack on the controller. All other connections are removable terminal blocks. The controller assembly is mounted on a plastic track that mounts directly on the terminal box. A specific enclosure and power supply are required in order to meet the stringent smoke control standards. See the *Product Ordering Information* table for part numbers.

The controller interfaces with the following external devices:

- 0-10V Damper Spring Return Actuator
- 0-10V Valve Spring Return Actuator
- Temperature sensors (room and averaging)
- Service and commissioning tools
- Analog input devices (0-10 Vdc, 4-20 mA, thermistor sensors, room temperature sensor, room setpoint dial, auxiliary temperature sensor)
- Analog output devices (0-10 Vdc) valve and damper actuators, variable speed fan control
- Digital input devices (dry contacts from motion sensors, alarm contacts)
- Digital output devices (fan, stages of electric heat, DX cooling, 2 position valves)

UL864 Listed for Smoke Control

The BACnet PTEC hardware has passed stringent electrical and thermal tests that ensure increased product reliability and performance as a part of a Siemens engineered smoke control system. The BACnet PTEC is used to control the operation of the fans and dampers based on the smoke control strategy being initiated in the supervisory controller.

Room Sensor/Room Unit

The room sensor connection to the controller board consists of a quick-connect RJ-11 jack. This streamlines installation and reduces controller start-up time.

Combination Temperature, Carbon Dioxide, and Relative Humidity Models

The Series 2200/2300 range of BACnet Programmable TEC (PTEC) room units includes temperature only or combination temperature/humidity, temperature/CO₂, or temperature/CO₂/humidity models. For these models, all measurement variables—CO₂, temperature and relative humidity values—are passed digitally to the PTEC. This information is passed from the room unit through the RJ-11 cable to the RTS port on the PTEC.



NOTE:

A CO₂ power module (product number AQM2200) is also needed for the CO₂ sensor option to function.

Unit Vent Controller Specifications

Dimensions	4-1/8" W × 11-1/4" L × 1-1/2" H
Weight	approx. 3 lbs (1.35 kg)
Controlled Temperature Accuracy, Heating or Cooling	±1.5°F (0.9°C)

Power Requirements	
Operating Range	24 Vac +/-20%, 50 or 60 Hz
Power Consumption	7 VA (plus 6 VA per DO), 60 VA max.

Inputs	
Analog	1 room temperature sensor (<i>Optional at RTS</i>) 1 setpoint 2 auxiliary temperature sensor (10K/100K Ω thermistor) 1 selectable 0-10 Vdc/4-20 mA
Digital	2 dry contacts

Outputs	
Analog	3 0-10 Vdc, 5 mA maximum
Digital	8 DO 24 Vac optically isolated solid state switches @ 0.25 amp

Communications	
Remote	BACnet MS/TP (EIA 485), 9600 bps to 76800 bps FLN Trunk
Local	WCIS and PTEC Tool

Ambient Conditions	
Shipping & Storage Temperature	-13°F to 158°F (-25°C to 70°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Humidity Range	5% to 95% rh (non-condensing)

Agency Listings	
UL Listing	UL 916, PAZX, UL 864, UUKL
cUL Listed	Canadian Standards C22.2 No. 205, PAZX7
FCC Compliance	47 CFR Part 15
BTL Listed	as a B-ASC device

Product Ordering Information

Description	Product Part Number
Smoke Control Listed BACnet PTEC Unit Vent Controller, UUKL.	550-493PKA
Large enclosure for electronic controller without damper actuator (long board).	550-002K
UL Listed Class 2 transformer with 120/240/277/480 Vac 50/60 HZ 0.4A primary w/ hub and 24 Vac 50 VA secondary w/ hub and circuit breaker.	TR50VA004
UL Listed Class 2 transformer with 120/240/277/480 Vac 50/60 HZ 0.5A primary w/ hub and 24 Vac 96 VA secondary w/ hub and circuit breaker.	TR100VA004
UL Listed Class 2 Transformer with primary 120V 60 HZ 0.2A secondary 24 Vac 30 VA.	KELE AM-2483-OA

Document Information

Technical Specification Sheets/Technical Instructions	Document Part Number
BACnet Protocol Implementation Conformance (PIC) Statement	149-1033
Room Temperature Sensors – Series 2200	149-601/149-820
Room Temperature Sensors – Series 2300	149-600/149-321
AQM2200 Power Module	129-111
Series 2200 Carbon Dioxide Room Units	129-609
Series 2300 Carbon Dioxide Room Units	129-608
Duct Temperature Sensor	149-134P25
Low Limit Detection Thermostat	155-016P25
Analog Sensors – 10K/100K Ohm Thermistor	149-262/149-982
QXA2601 Condensation Sensor	149-931
Siemens Valves	Document Part Number
599 Series Zone Valves 2-Way, 3-Way Zone Valve Electric	154-034
599 Series Zone Valves and Actuators – Modulating, On/Off Spring Return, 2-Position Control	154-063
Siemens Electronic Actuators	Document Part Number
OpenAir Electronic Damper Actuators, GDE/GLB Series Non-spring Return Rotary 24 Vac – Modulating Control 0 to 10 Vdc	155-187P25
OpenAir Electronic Damper Actuators, GDE/GLB Series Non-spring Return, 24 Vac Floating Control, Rotary	155-188P25
OpenAir GEB Series Non-spring Return, 24 Vac, 132 lb-in Rotary Electronic Damper Actuators (modulating 0 to 10 Vdc or floating control)	155-318P25

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