SIEMENS

BACnet Programmable TEC Terminal Box (VAV) Controller

The BACnet PTEC Terminal Box (VAV) Controller is an integral part of BACnet network. The controller provides high performance Direct Digital Control (DDC) of pressure-independent, variable-air-volume zone-level routines.

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

- 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, CO_2, 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.

- Plenum rated controller.

- Unique control algorithms for specific applications.

- Reports airflow in cfm (lps).

- Meets low duct static pressure requirements.

- Separate minimum and maximum air volume setting for heating and cooling modes.

- Demand Control Ventilation minimum setpoint (controllable by PPCL).

- Separate minimum night flow setpoint to reduce energy.

Applications

- Slave Mode (Application 6688)

- VAV Cooling Only (Application 6620)

- VAV Cooling or Heating (Application 6621)

- VAV with Electric Reheat or Baseboard Radiation (Application 6622)

- VAV with Hot Water Reheat (Application 6623)

- VAV Series Fan Powered with Electric Reheat (Application 6624)

- VAV Series Fan Powered with Hot Water Reheat (Application 6625)

- VAV Parallel Fan Powered with Electric Reheat (Application 6626)

- VAV Parallel Fan Powered with Hot Water Reheat (Application 6627)

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 Terminal Box (VAV) Controller consists of an electronic controller assembly and on-board differential pressure sensor.

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.

An optional enclosure (P/N 540-155) protects the controller assembly.

Autozero Modules (optional devices) are available for mounting with the controller for those applications where uninterrupted airflow is necessary. An optional Pneumatic Transducer provides control of pneumatic damper and valve actuators.

The controller interfaces with the following external devices:

- Averaging air velocity sensors provided by VAV terminal unit manufacturers

- Floating control valve and damper actuators

- Temperature sensors (room, supply, discharge, duct, immersion, and outside air)

- Service and commissioning tools

- Analog input devices (thermistor sensors, room temperature sensor, room setpoint dial, auxiliary temperature sensor)

- Digital input devices (dry contacts from motion sensors, alarm contacts)

- Digital output devices (fan, stages of electric heat, 2 position valves, floating control actuators)

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 room unit, usable with the BACnet Programmable TEC (PTEC/ATEC) includes temperature only or combination temperature/humidity, temperature/CO_2, or temperature/CO_2/humidity models. For these models, all measurement variables—CO_2, temperature and relative humidity values—are passed digitally to the PTEC/ATEC. This information is passed from the room unit through the RJ-11 cable to the RTS port on the PTEC/ATEC.

i	NOTE: A CO_2 power module (product number AQM2200) is also needed for the CO_2 sensor option to function.

Terminal Box Controller Specifications

Dimensions	4-1/8" W × 7-3/4" 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	3 VA (plus 12 VA per DO)

Inputs	
Analog	1 room temperature sensor 1 velocity sensor *(Optional)* 1 setpoint 1 auxiliary temperature sensors (10K/100K Ω thermistor)
Digital	2 dry contacts

Outputs	
Analog	N/A
Digital	6 DO 24 Vac optically isolated solid state switches @ 0.5 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
cUL Listed	Canadian Standards C22.2 No. 205, PAZX7
FCC Compliance	47 CFR Part 15
BTL Listed	as a B-ASC device

Optional Accessories

Autozero Module

The optional Autozero Module (product number 540-380) should be used when continuous operation at occupied flow is required for an area. The Autozero Module is connected to the air velocity inlet ports of the controller and provides periodic recalibration of the air velocity transducer without changing air volume being delivered to a room. This recalibration ensures long-term precise airflow delivery.

Autozero Module Specifications

Power Consumption	.75 VA @ 24 Vac max.
Dimensions	2" W x 1.51" H x 1.89" D (58 mm x 78 mm x 29 mm)
Weight	1.3 oz. (36.9 g)

Autozero Module.

Differential Pressure Sensor

The differential pressure sensor is easily connected to the box's air-velocity sensing elements to provide measurement of the differential pressure. The measured value is converted to actual airflow in cfm (lps) by the controller.

Differential Pressure Sensor Specifications

Temperature Range	32°F to 122°F (0°C to 50°C)
Measurement Range	0 to 5200 fpm (0 to 26 m/s)

Product Ordering Information

Description	Product Part Number
BACnet PTEC Terminal Box (VAV) Controller	550-432PA
Small enclosure for electronic controller without damper actuator (short board).	540-155

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