SIEMENS

Technical Specification Sheet
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BACnet Programmable TEC Terminal Box (VAV) Controller for Smoke Control

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

- 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, 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.
- 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 6687)
- VAV Cooling Only (Application 6600)

- VAV Cooling or Heating (Application 6601)
- VAV with Electric Reheat or Baseboard Radiation (Application 6602)
- VAV with Hot Water Reheat (Application 6603)
- VAV Series Fan Powered with Electric Reheat (Application 6604)
- VAV Series Fan Powered with Hot Water Reheat (Application 6605)
- VAV Parallel Fan Powered with Electric Reheat (Application 6606)
- VAV Parallel Fan Powered with Hot Water Reheat (Application 6607)

Control algorithms are pre-programmed. The controller is ready to operate after selecting the application. If desired, the operator may adjust the air volume setpoints in cfm (lps), 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 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. 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.

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 or analog (0-10 Vdc) control valve and damper actuators
- Temperature sensors (room, supply, discharge, duct, immersion, and outside air)
- 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, 2 position valves, floating control actuators)

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/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. This information is passed from the room unit through the RJ-11 cable to the RTS port on the PTEC.

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 × 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 1 velocity sensor *(Optional)* 1 setpoint 2 auxiliary temperature sensors (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

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)

Pneumatic Transducer

An optional PTS Pneumatic Transducer provides the signal conversion from electronic to pneumatic. The module is piped to the pneumatic actuator and wired to the controller. This transducer provides for accurate control of pneumatic actuators for precise temperature and air volume control.

Pneumatic Transducer Specifications

Maximum Input Pressure	30 psi (207 kPa)
Air Consumption	0 SCIM
Power Consumption	4 VA @ 24 Vac max.
Dimensions	3-1/2" L × 2-1/4" W × 1-1/2" H (87 mm × 57 mm × 38 mm)
Weight	9 oz (0.3 kg)

Product Ordering Information

Description	Product Part Number
Smoke Control Listed BACnet PTEC Terminal Box (VAV) Controller, UUKL.	550-495PKA
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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Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Parkway
Buffalo Grove, IL 60089-4513
USA
Tel. 1 + 847-215-1000

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