SIEMENS

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

The new Siemens BACnet PTEC VAV/Terminal Box Controller provides high performance Direct Digital Control (DDC) of pressure-independent, variable-air-volume zone-level routines. The Siemens BACnet PTEC VAV/Terminal Box Controller 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.
- 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.
- PID control of HVAC systems to minimize offset and maintain 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.
- Applications in 550-495P include a user-adjustable temperature offset for the room temperature reading when required for validation purposes.

Applications

- Slave Mode (Application 6587)
- VAV Cooling Only (Application 6520)
- VAV Cooling or Heating (Application 6521)
- VAV with Electric Reheat or Baseboard Radiation (Application 6522)
- VAV with Hot Water Reheat (Application 6523)
- VAV Series Fan Powered with Electric Reheat (Application 6524)
- VAV Series Fan Powered with Hot Water Reheat (Application 6525)
- VAV Parallel Fan Powered with Electric Reheat (Application 6526)
- VAV Parallel Fan Powered with Hot Water Reheat (Application 6527)

Control algorithms are preprogrammed. 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 our 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 Siemens BACnet PTEC VAV/Terminal Box Controller consists of an electronic controller, a differential pressure transducer and a damper actuator 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.

Autozero Modules are available for mounting on the controller for those applications where uninterrupted airflow is necessary. A 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, duct, immersion, and outside air)
- Service and commissioning tools
- Digital input devices (dry contacts from motion sensors, alarm contacts)
- Digital output devices (fan, stages of electric heat)

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

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 and Relative Humidity Models

The Series 2200 range of TEC room units includes combination temperature and humidity models. For these models, both temperature and relative humidity values are passed digitally to the TEC. This information is passed from the room unit through the RJ-11 cable to the RTS port on the TEC. See the *Series 2200 Temperature Room Units for TEC and ATEC Technical Specification Sheet* (149-820), for more information.

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	19.2 to 27.6 Vac, 50 or 60 Hz
Power Consumption	10 VA (plus 12 VA per DO)

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Operating Range	19.2 to 27.6 Vac, 50 or 60 Hz
Power Consumption	10 VA (plus 5 VA per DO), 60 VA max

Inputs	
Analog	1 room temperature sensor 1 velocity sensor 1 setpoint (optional) 2 auxiliary temperature sensors (10K Ω thermistor) 1 selectable 0-10 Vdc/4-20 mA
Digital	2 dry contacts

Outputs	
Analog	3 0-10 Vdc
Digital	8 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	
Storage Temperature	-40°F to 167°F (-40°C to 75°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Humidity Range	0% to 92% (non-condensing)

Agency Listings	
UL Listing	UL 864, UUKL, PAZX
cUL Listed	Canadian Standards C22.2 No. 205-M1983, PAZX7
FCC Compliance	47 CFR Part 15

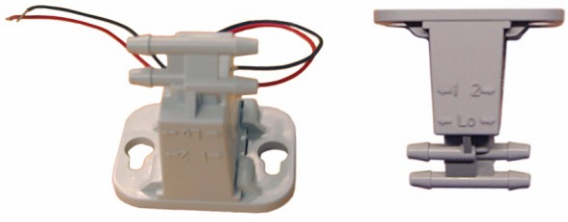
Optional Accessories

Autozero Module

The optional Autozero Module (see Figure *Autozero Module*) is required 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

The 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. See *Sensors and Transducers Configuration and Sizing* for part numbers and ordering information.

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 Siemens BACnet PTEC VAV/Terminal Box Controller, UUKL	550-495PK
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
Room Temperature Sensors – Series 2200	149-820
Duct Temperature Sensor	149-134P25
Low Limit Detection Thermostat	155-016P25
Analog Sensors – 10 K Ohm Thermistor	149-912, 149-915, and 149-916
Siemens Valves and Electronic Actuators	
599 Series Zone Valves 2-Way, 3-Way Zone Valve Electric and Thermic Actuators	155-034
599 Series Zone Valves and Actuators – Modulating, On/Off Spring Return, 2-Position Control	155-063

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BACnet Protocol Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Revision	Firmware Revision
Smoke Control Listed Siemens BACnet PTEC VAV/Terminal Box Controller, UUKL	550-495PK	Revision 4 (135-2004)	2.0.5.1	BV43

Date Tested: July 2011 – B-ASC

Vendor Information

Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Parkway
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www.buildingtechnologies.siemens.com/bt/us

Product Description

The controller is an integral part of Siemens controls system. The controller can operate stand-alone or can be networked to perform complex HVAC control, monitoring, and energy management functions. This controller communicates using BACnet MS/TP.

BACnet Standardized Device Profile

Product	Device Profile	Tested
PTEC	BACnet Application Specific Controller (B-ASC)	✓

Supported BACnet Interoperability Building Block (BIBBs)

Product	BIBB	Name	Tested
PTEC	DS-RP-B	Data Sharing-ReadProperty-B	✓
	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	✓
	DS-WP-B	Data Sharing-WriteProperty-B	✓
	DM-DDB-B	Device Management-Dynamic Device Binding-B	✓
	DM-DOB-B	Device Management-Dynamic Object Binding-B	✓
	DM-DDC-B	Device Management-DeviceCommunicationControl-B	✓
	DM-RD-B	Device Management-ReinitializeDevice-B	✓
	DM-BR-B	Device Management-Backup and Restore-B	✓
	DM-OCD-B	Device Management-Object Creation and Deletion-B	✓

Standard Object Types Supported

Product	Object Type	Creatable	Deletable
PTEC	Analog Input	No	No
	Analog Output	Yes	Yes
	Binary Input	No	No
	Binary Output	Yes	Yes
	Device	No	No
	File	Yes	Yes
	Program	Yes	Yes

Data Link Layer Options

Product	Data Link and Options
BTEC	MS/TP master (Clause 9), baud rate(s): 9600 bps, 19200 bps, 38400 bps, 76800 bps
	MS/TP slave (Clause 9), baud rate(s): 9600 bps, 19200 bps, 38400 bps, 76800 bps

Segmentation Capability

Product	Segmentation Type	Supported	Window Size: 32 (MS/TP product limited to 1)
BTEC	Able to transmit segmented messages	No	
	Able to receive segmented messages	No	

Device Address Binding

Product	Static Device Binding Supported
BTEC	Yes

Networking Options

Product	Static Device Binding Supported
BTEC	No

Character Sets

Product	Charcter Sets Supported
BTEC	ANSI X3.4