

Siemens BACnet Programmable VAV with Chilled Beam, Demand Control Ventilation (CO2) and Floating or Analog Output



The new Siemens BACnet PTEC VAV with Chilled Beam, Demand Control Ventilation (CO2) and Floating or Analog Output Controller provides high performance Direct Digital Control (DDC) of pressure-independent, variable-air-volume zone-level routines. It 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.
- 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.
- Plenum rated controller.
- Separate minimum and maximum air volume setting for heating and cooling modes.
- User adjustable offset for the room temperature reading when required for validation purposes.
- Reports airflow in cfm (lps)

Applications

- VAV with Chilled Beam, Demand Control Ventilation (CO2) and Floating or Analog Output Controller (Application 6658)
- Slave Mode (Application 6692)

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 with Chilled Beam, Demand Control Ventilation (CO2) and Floating or Analog Output 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 550-002) protects the controller assembly.

Autozero Modules (optional devices) are available for mounting with 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
- Analog control valve actuators
- Temperature sensors (room, duct, immersion, and outside air)
- Service and commissioning tools
- Digital input devices (condensate sensors, dry contacts from motion sensors, alarm contacts)
- Digital output devices (fan, stages of electric heat)
- Room Unit with Humidity and/or CO2 sensing
- Analog CO2 Sensors

Combination Carbon Dioxide, Temperature and Relative Humidity Models

The Series 2200/2300 range of BACnet Programmable TEC (PTEC) room units includes combination CO2/temperature and CO2/humidity/temperature 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.

Chilled Beam 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 12 VA per DO)

Inputs	
Analog	1 room temperature sensor 1 velocity sensor 1 setpoint (optional) 1 auxiliary temperature sensors (10K/100K Ω thermistor) 2 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, 1/8 load
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)

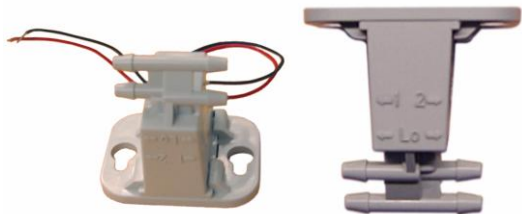
Agency Listings	
UL Listing	UL 916, PAZX
cUL Listed	Canadian Standards C22.2 No. 205-M1983, PAZX7
FCC Compliance	47 CFR Part 15
BTL Listed	as a B-ASC device

Autozero Module

The optional Autozero Module (product number 540-533) 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.

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 x 2-1/4" W x 1-1/2" H (87 mm x 57 mm x 38 mm)
Weight	9 oz (0.3 kg)

Product Ordering Information

Description	Product Part Number
Siemens BACnet PTEC VAV with Chilled Beam, Demand Control Ventilation (CO2) and Floating or Analog Output Controller	550-494P
Large enclosure for electronic controller without damper actuator (long board).	550-002

Document Information

Technical Specification Sheets/Technical Instructions	Document Part Number
Room Temperature Sensors – Series 2200	149-601
Room Temperature Sensors – Series 2300	149-600
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 – 10 K/100KOhm Thermistor	149-262/149-982

Technical Specification Sheets/Technical Instructions	Document Part Number
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	155-318P25

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BACnet Protocol Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Revision	Firmware Revision
Siemens BACnet PTEC VAV with Chilled Beam, Demand Control Ventilation (CO2) and Floating or Analog Output Controller	550-494P	Revision 4 (135-2004)	2.0.5.6	BB50

Date Tested: July 2011 – B-ASC

Vendor Information

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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
PTEC	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)
PTEC	Able to transmit segmented messages	No	
	Able to receive segmented messages	No	

Device Address Binding

Product	Static Device Binding Supported
PTEC	Yes

Networking Options

Product	Static Device Binding Supported
PTEC	No

Character Sets

Product	Character Sets Supported
PTEC	ANSI X3.4