SIEMENS

Technical Specification Sheet
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Siemens BACnet Terminal Box (VAV) Controller

BTL Listed - B-ASC device

The new Siemens BACnet Terminal Box (VAV) Controller provides high performance direct digital control (DDC) of pressure-independent, variable-air-volume zone-level routines. The Siemens BACnet Terminal Box (VAV) 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

- Communicates using BACnet MS/TP protocol for open communications on BACnet MS/TP networks
- BTL listed as B-ASC device
- PID control of HVAC systems to minimize offset and maintain tighter setpoint control
- Unique control algorithms for specific applications
- Reports airflow in cfm (lps)
- Setpoints and control parameters assigned and changed locally or remotely
- Electrically Erasable Programmable Read Only Memory (EEPROM) used for storing setpoints and control parameters—no battery backup required
- Returns from power failure without operator intervention
- Meets low duct static pressure requirements
- No calibration required, thereby reducing maintenance costs
- Separate minimum and maximum air volume setting for heating and cooling modes
- Applications in P/Ns 550-432 include a user-adjustable temperature offset for the room temperature reading when required for validation purposes.

Applications

- VAV Cooling Only (Application 2530)
- VAV Cooling or Heating (Application 2531)
- VAV with Hot Water Reheat (proportional) (Application 2532)
- VAV with Electric Reheat (1 to 3-stages) (Application 2533)
- VAV Fan Powered Series or Parallel with Hot Water Reheat (Application 2534 or 2536)
- VAV Fan Powered Series or Parallel with Electric Reheat (1 to 3-stages) (Application 2535 or 2537)

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.

Hardware

Controller Board

The Terminal Box Controller consists of an electronic controller assembly and a differential pressure transducer. 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. An Autozero Module is 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)

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. See the *Room Temperature Sensors Technical Specification Sheet* (149-312P25), for more information.

Terminal Box Controller Specifications

Power Requirements	
Operating Range	
Power	19.2 to 27.6 Vac, 50 or 60 Hz
Consumption	10 VA (plus 12 VA per DO)
Inputs	
Analog	1 room temperature sensor 1 velocity sensor 1 setpoint (optional) 1 auxiliary temperature sensor
Digital	2 dry contacts
Outputs	6 DO 24 Vac optically isolated solid state switches @ 0.5 amp
Controlled Temperature	±1.5°F (0.9°C)
Accuracy, Heating or Cooling	
Dimensions	4-1/8" W × 7-3/4" L × 1-1/2" H (105 mm × 197 mm × 38 mm)
Weight	approx. 3 lbs. (1.35 kg)
Communications	
Remote	BACnet MS/TP (EIA 485), 9600 bps to 76800 bps FLN Trunk
Local	WinCIS
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 916, PAZX,
cUL Listed	Canadian Standards C22.2 No. 205-M1983, PAZX7
FCC Compliance	47 CFR Part 15

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)

Optional Accessories

Autozero Module

The optional Autozero Module (Figure 2) 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 Terminal Box 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	1.5 VA @ 24 Vac max.
Dimensions	2-1/2" W × 2-1/2" H × 1" D (64 mm × 64 mm × 32)
Weight	0.5 lb. (0.2 kg)

Figure 2. Autozero Module.

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 Terminal Box 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 Numbers
BACnet Terminal Box Controller	550-432
Pneumatic Transducer	PTS4
Autozero Module	540-378

Document Ordering Information

Specification Sheet/Application Bulletin	Document Part Number
Duct Temperature Sensor	149-134P25
Electronic Damper Actuator	155-188P25 (GDE 131.1P)
Siemens Valves and Electronic Actuators:	
Flowrite 599 Series – Valve and Actuator Assembly Selection	155-304P25
Powermite 599 Series – MT Series Terminal Unit Valve and Actuator Assembly Selection	155-306P25
Powermite 599 Series – MZ Series Zone Control Valve and Actuator Assembly Selection	155-307P25

BACnet Protocol
Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Version	Firmware Version
BACnet Terminal Box Controller (BTEC)	550-432	135-2001b	1.2	BV13 1.0

Date Tested: August 2005 – B-ASC

Vendor Information

Siemens Building Technologies
1000 Deerfield Parkway
Buffalo Grove, IL 60089
www.sbt.siemens.com

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
BTEC	BACnet Application Specific Controller (B-ASC)	✓

Supported BIBBs

Product	Supported BIBBs	BIBB Name	Tested
BTEC	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-DynamicDeviceBinding-B	✓
	DM-DOB-B	Device Management-DynamicObjectBinding-B	✓
	DM-DDC-B	Device Management-DeviceCommunicationControl-B	✓

Standard Object Types Supported

Product	Object Type	Creatable	Deletable
BTEC	Analog Input	No	No
	Analog Output	No	No
	Binary Input	No	No
	Binary Output	No	No
	Device	No	No

Data Link Layer Options

Product	Data Link	Options
BTEC	MS/TP Master	9600, 19200, 38400, 76800
	MS/TP Slave	9600, 19200, 38400, 76800

Segmentation Capability

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

Device Address Binding

Product	Static Binding Supported
BMEC	Yes

Networking Options

Product	Static Binding Supported
BTEC	No

Character Sets

Product	Character Sets supported
BTEC	ANSI X3.4