

## BACnet Heat Pump Controller



**Figure 1. BACnet Heat Pump Controller.**

The BACnet Heat Pump Controller is an integral part of the Siemens Building Technologies, Inc. controls system, providing high performance Distributed Digital Control technology for room temperature control of heat pumps. The BACnet Heat Pump Controller and related components provide a totally electronic control system.

This controller communicates with the Siemens controls system. It can operate stand-alone or can be networked to perform complex HVAC control, monitoring, and energy management functions without relying on a higher-level processor.

### Features

- Communicates using BACnet MS/TP protocol for open communications on BACnet MS/TP networks
- BTL listed as B-ASC
- PID control of HVAC systems to minimize offset and maintain tighter setpoint control
- Unique control algorithms for specific applications

- 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
- Control capable of modulating floating control electronic or electric damper actuator
- Damper status reported in percentage open notation (floating control)
- Damper status reported in voltage notation (0-10 Vdc actuators)
- Applications in P/N 550-790A include a user-adjustable offset for the room temperature reading when required for validation purposes

### Applications

- Single-stage heat pump control
- Multiple compressor with reversing valve and mixed air control
- Heating and cooling compressors and mixed air

Control algorithms are preprogrammed. The controller is ready to operate after selecting the application. If desired, the operator may adjust the room temperature setpoints and other parameters. The controller is designed for operation and modification without vendor assistance.

### Hardware

#### Controller Board

The BACnet Heat Pump Controller consists of an electronic controller 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 heat pump. An optional enclosure protects the controller assembly.

The BACnet Heat Pump Controller interfaces with the following external devices:

- Floating control or Spring-return damper actuator
- Temperature sensors (room, mixed air)
- Service and commissioning tools
- Digital input devices (dry contacts from motion sensors, alarm contacts, switches)
- Digital output devices (fan, reversing valve, single or two-stage compressor, single-stage or auxiliary heat)

### Room Sensor

The room sensor connection to the controller board consists of a quick-connect RJ-11 jack. This streamlines installation and reduces the controller's start-up time. See the *Room Temperature Sensors Technical Specification Sheet* (149-312P25), for more information.

## Document Ordering Information

Specification Sheet	Document P/N
Duct Temperature Sensor	149-134P25
Electronic Damper Actuator	155-188P25 (GDE 131.1P)
Siemens Valves and 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

## Specifications

Power Requirements	
Operating Range	19.2 to 27.6 Vac, 50 or 60 Hz
Power Consumption	10 VA (plus 12 VA per DO)
Inputs	
Analog	1 room temperature sensor (10k thermistor) 1 setpoint (optional at RTS) 1 auxiliary temperature sensor (100k 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
Controlled Temperature Accuracy, Heating or Cooling	±1.5°F (0.9°C)
Dimensions	4-1/8" W x 11-1/4" L x 1-1/2" H (105 mm x 197 mm x 38 mm)
Weight	approx. 2.5 lbs. (1.13 kg)
Communications	
Remote	BACnet MS/TP (EIA 485) 9600 bps to 76800 bps FLN Trunk
Local	Portable Operator's Terminal
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

## Product Ordering Information

Description	Product Part Numbers
BACnet Heat Pump Controller	550-790A

# BACnet Protocol Implementation Conformance Statement

## Products

Product	Model Number	Protocol Revision	Software Version	Firmware Version
BACnet Terminal Equipment Controller (BTEC)	550-790A	135-2001b	1.2	BM12 1.0

Date Tested: August 2005 – B-ASC

## Vendor Information

Siemens Building Technologies  
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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
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

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