The Andover Continuum™ b3865-V, b3866-V and b3885-V are native BACnet controllers that communicate on an RS-485 field bus as Master devices using the MS/TP BACnet protocol.
BACnet b3865/866/885-V VAV Controllers with Built-in Actuator

Features

- The b3865-V is the base model with four universal inputs, an airflow sensor, three Form A triac-based outputs, and an integrated damper actuator.
- The b3866-V model is identical to the b3865-V, with the exception that it also offers damper position feedback and two analog outputs to control reheat valves, lighting ballasts, etc.
- The b3885-V has a reduced I/O point count for smaller VAV applications.
- All VAV models feature Flash memory, user memory for programs, and a fast (32-bit) processor for faster can times, with plenty of additional memory available for data logging of your critical data.

PRODUCT AT A GLANCE

- Native BACnet MS/TP communications
- Support for 18 BACnet object types, including Trends, Schedules, Calenders, and Loops
- Low-cost VAV control in compact package
- Built-in damper actuator simplifies hardware installation
- Universal inputs with Form A, Form K, and analog outputs for flexible control options
- Non-volatile Flash memory for application program and operating system storage
- Easy on-line software updates
- Local extended storage of log data
- On-board airflow sensor
- Optional Andover Continuum Smart Sensor Display
- Complies with B-AAC BACnet profile
- Support for Wireless BACnet Field Bus communications

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<th>Feature</th>
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<th>b3885-V</th>
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<tr>
<td>Universal Inputs</td>
<td>4</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Airflow Sensor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Smart Sensor Input</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Form A Triac Outputs</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Analog Outputs</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Integrated Actuator</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Service Port</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Wireless Option</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

The controllers are highly intelligent, low-cost VAV box controllers that come equipped with a built-in actuator to streamline hardware installation and save commissioning time. Universal inputs, an airflow sensor, Form A triac-based outputs, and an integrated damper actuator make these controllers perfect for VAV applications. The b3865/866-V models feature a room sensor input, which supports our Andover Continuum Smart Sensor, or any standard room temperature sensor.
As native BACnet controllers, the b3865/866/885-V models can communicate with other BACnet devices on the MS/TP network, in strict accordance with ANSI/ASHRAE standard 135-2004. By connecting to the Andover Continuum bCX1, the controllers, or other MS/TP devices can share and gather data from the wider Ethernet/IP network of controllers. Among those Ethernet controllers can be Andover Continuum controllers (BACnet or Andover Continuum Infinet) or third party BACnet IP devices. All Andover devices, both BACnet and Andover Continuum Infinet, are fully compatible with the Andover Continuum CyberStation front-end software, a fully native BACnet Operator Workstation (B-OWS) application.

A Highly Intelligent Controller
Andover Continuum field controllers are highly intelligent and the VAV models are no exception. TAC designs the Andover Continuum field controllers to handle schedules, alarms and trends locally so there is no reliance on any supervisory controllers. Since each controller is programmable and can operate independently, the Andover Continuum is highly reliable. Furthermore, each controller is “peer-to-peer” and can share data with any Andover Continuum or third party BACnet controller.

Optional Wireless BACnet
The b3865/866/885-V BACnet controllers can also communicate using a wireless mesh BACnet network. Simply plug Andover Continuum Wireless Adapters into the service ports of the BACnet controllers with wireless compatible firmware to create a wireless mesh network that sends and receives BACnet messages. Because the native BACnet communications are used wirelessly, the bCX1 connects the entire wireless BACnet network to the wired BACnet networks in your system, regardless of manufacturer.

Increased Reliability with Flash Memory
The non-volatile Flash memory stores your operating system and application programs, so that in the event of a power loss, your application is restored when power is returned. In addition, the Flash memory allows for easy upgrades of your operating system via software downloads, eliminating the need to swap out memory chips. Each controller, except the b3885-V, includes an on-board battery to safeguard your runtime data — protecting all point data and log data from being lost if power is removed.

Inputs
The inputs consist of two or four full-range Universal inputs that accept voltage (0-5VDC), digital (on/off), counter signals (up to 4Hz), or temperature signals, plus an on-board air flow sensor. The b3865/866-V models also offer an additional input to support the Andover Continuum Smart Sensor, or any standard room temperature sensor.

Outputs
The b3865/866-V controllers contain three Form A Triac-based outputs. The b3885-V controller contains two Form A Triac-based outputs. These outputs can be used separately for on/off or pulsed control of lighting, heat, and fan units or for bi-directional control of dampers and valves; or configured into one Form K Tri-state output and one Form A output. (Note: Any two consecutive Triac outputs can be configured as a Form K output.) Outputs are rated for AC loads only. The b3866-V controller also offers two (0-10V) analog outputs.
BACnet b3865/866/885-V VAV Controllers with Built-in Actuator

Features (continued)

Damper Actuator
The integrated damper actuator allows simple direct mounting of the controller directly over the existing damper shaft. This eliminates the need for separate mounting, wiring, and positioning of the damper motor. Also, the actuator has a built-in clutch button to temporarily disengage the direct-drive gears during commissioning. The controller actuator may be preset for a limited range of motion using the mechanical “stops” provided.

Software Capabilities
The dynamic memory of the b3865/866/885-V controllers can be allocated for any combination of programs, scheduling, alarming, and data logging using the powerful Andover Plain English programming language. Our object-oriented Plain English language with intuitive keywords provides an easy method to tailor the controller to meet your exact requirements. Programs are entered into the controller using Andover Continuum CyberStation. Programs are then stored and executed by the controller. Programming multiple b3865/866/885-V controllers is inherently easy with Plain English. A complete copy of one controller’s programs can be loaded directly into other controllers without changing any point names or programs.

Smart Sensor Interface
The b3865/866-V controllers provide a built-in connection for an Andover Continuum Smart Sensor. The Smart Sensor provides a two-character LED display and a six-button programmable keypad that enables operators and occupants to change setpoints, balance VAV boxes, monitor occupancy status, and turn equipment on and off. An enhanced version of the Smart Sensor is also available with a four-digit custom LCD that provides the following icons: PM, %, °, Setpoint, Cool, Heat, CFM, Fan, OA, and SP.
BACnet b3865/866/885-V VAV Controllers
with Built-in Actuator
Specifications

b3865/866/885-V Controller

**Electrical**
- **Power**
  - 24 VAC, +10%-15%, 50/60 Hz,
  - Class 2 Limited Power
- **Power Consumption**
  - Less than 10 VA
- **Overload Protection**
  - Fused, MOV protected

**Mechanical**
- **Operation Environment**
  - 32° to 122°F (0-50°C),
  - 10 - 90% RH (non-condensing)
- **Dimensions**
  - 7.75˝ W x 6.25˝ L x 2.5˝ H
  - (197 mm W x 159 mm L x 63 mm H)
- **Weight**
  - 2.50 lbs (1.04 kg)

**Battery**
- Replaceable, rechargeable battery.
- Provides 30 days typical accumulated power failure backup of RAM memory.
- All data stored in Flash on power loss.

**Communications**
- **RS-485 port for implementing**
- BACnet MS/TP connection, including:
  - Three-position removable screw terminal
  - Standard service port, four-position shrouded connector
- **LEDs:**
  - TD = Transmit Enable
  - RD = Received Data
- **Wired/Wireless Field Bus**
  - RS-485 port for implementing
  - Wireless BACnet connection, including:
    - Standard service port, four-position shrouded connector
- **User LEDs**
  - Status Indicator LEDs:
    - CPU: CPU Active
      - Green = Active
  - **Airflow Input**
    - **Range**
      - 0 to 1˝ W.C. (0-250 Pa)
    - **Resolution**
      - 0.0013˝ W.C. (0.33Pa) @ 73°F (23°C)
    - **Accuracy**
      - ± 0.05˝ W.C. (12.50 Pa) @ 73°F (23°C)
  - **Damper Shaft Mounting Screws**
    - **Shaft Diameter**
      - 1/2˝ (with a 3/8˝ adapter)
      - 12.6 mm (with a 9.45 mm adapter)
    - **Shaft Torque**
      - 53 inch-pounds (5.989 Nm)
    - **Shaft Torque**
      - 180 sec. @ 60 Hz and 216 sec @ 50 Hz:
      - for 90° adjustable end limits with two set screws
- **Motor**
  - Type: 24 VAC synchronous
  - Motor Protection: Mechanical clutch
  - Manual clutch override with a push-button release
  - Hardware position feedback
  - (model b3866-V only)
- **Universal Inputs**
  - **Connections**
    - Model b3865-V: Four inputs and two returns
    - Model b3866-V: Four inputs and two returns
    - Model b3885-V: Two inputs and one return
  - **Input Voltage Range**
    - 0 to 5.115 VDC
  - **Input Impedance**
    - 10K ohm to 5.120 V
  - **Input Voltage Resolution**
    - 5.0 mV
  - **Digital Resolution**
    - 10 bits
  - **Input Voltage Accuracy**
    - ± 15mV
  - **Temperature Range**
    - -30° to 230°F (-34° to 110°C)
  - **Temperature Accuracy**
    - ± 1° F from -10° to 150°F
      - (± 0.56°C from -23° to +66°C)
  - **Counter Frequency**
    - 4 Hz @ 50% duty cycle
  - **Input Protection**
    - ± 1000 V transients
  - **Input Filter**
    - 16 Hz with one pole RC filter
  - **Connector**
    - Removable, 5 mm screw terminal
### Smart Sensor Interface

**Connections**
- Model b3865-V: One input, SPWR, and return
- Model b3866-V: One input, SPWR, and return
- Model b3885-V: Not available

### Digital Outputs

**Connections**
- Model b3865-V: Three triac outputs and one reference
- Model b3866-V: Three triac outputs and one reference
- Model b3885-V: Two triac outputs and one reference

**SPST Accuracy**
- 0.1 second for pulse width modulation

**Contact Ratings**
- 0.5 A Maximum, 24 VAC

**Connector**
- Removable, 5mm screw terminal

### Analog Outputs

**Connections**
- Model b3865-V: Not available
- Model b3866-V: Two analog outputs and one return
- Model b3885-V: Not available

**Analog Output Channels Required**
- Two, voltage only

**Voltage Output Range**
- 0 – 10 V

**Output Source Current**
- 5 mV Maximum

**Voltage Output Load**
- 2K ohm Minimum Impedance

**Voltage Output Resolution**
- 50 mV

**Digital Resolution**
- 8 bits

**Output Voltage Accuracy**
- 100 mV

**Connector**
- Removable, 5mm screw terminal

### Agency Listings

- FCC Rules and Regulations CFR 47, Part 15, Class A, ICES-003

### Models

- **b3865-V**: BACnet 865-V VAV Controller
- **b3866-V**: BACnet 866-V VAV Controller
- **b3885-V**: BACnet 885-V VAV Controller
- **b3865-V-WL**: Wireless BACnet 865-V VAV Controller
- **b3866-V-WL**: Wireless BACnet 866-V VAV Controller
- **b3885-V-WL**: Wireless BACnet 885-V VAV Controller

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On October 1st, 2009, TAC became the Buildings Business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.