

Andover Continuum™

b3865/866 VAV Controllers with Built-in Actuator

The Andover Continuum™ b3865 and b3866 are native BACnet controllers that communicate on an RS-485 field bus as Master devices using the MS/TP BACnet protocol.



Andover Continuum b3865/866 VAV Controllers with Built-in Actuator Features



PRODUCT AT A GLANCE

- Native BACnet MS/TP Communications for Interoperability to Third-Party Systems
- Supports 18 BACnet Object Types including Trends, Schedules, Calendars, and Loops
- Compact Terminal Controllers Provide Low-cost VAV Control
- 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 Provides Utmost Reliability – Stores Both Application Program and Operating System
- Flash Memory Allows Easy On-Line Software Updates
- Local Extended Storage of Log Data
- On-Board Airflow Sensor
- View and Modify Information with Optional Andover Continuum Smart Sensor Display
- BTL Listed B-AAC Controller with Local Trends



The b3865 and b3866 are unique, low-cost VAV box controllers that come equipped with a built-in actuator to streamline hardware installation and save commissioning time. Four universal inputs; an airflow sensor; three Form A triac-based outputs; and an integrated damper actuator, make these controllers perfect for VAV applications requiring reheat control. Both models feature a room sensor input, which supports Andover Continuum Smart Sensor, or any standard room temperature sensor.

- The b3866 model is identical to the b3865, with the exception that it also offers two analog outputs to control reheat valves, lighting ballast control, etc.
- The b3865/866 features Flash memory, increased user memory, and a fast (32-bit) processor for faster scan times, with plenty of additional memory available for data logging of your critical data.

As native BACnet controllers, the b3865/866 can communicate with other BACnet devices on the MS/TP network, in strict accordance with ANSI/ASHRAE standard 135-2004, and are listed with the BACnet Testing Labs (BTL) as BACnet Advanced Application Controllers (B-AAC). By connecting to the Andover Continuum bCX1 or b4920, the b3865/866 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.

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Features (continued)

Increased Reliability with Flash Memory

The b3865/866's non-volatile Flash memory stores your operating system and application programs, so that in the event of a power loss, your application will be 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 proms. The b3865/866 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

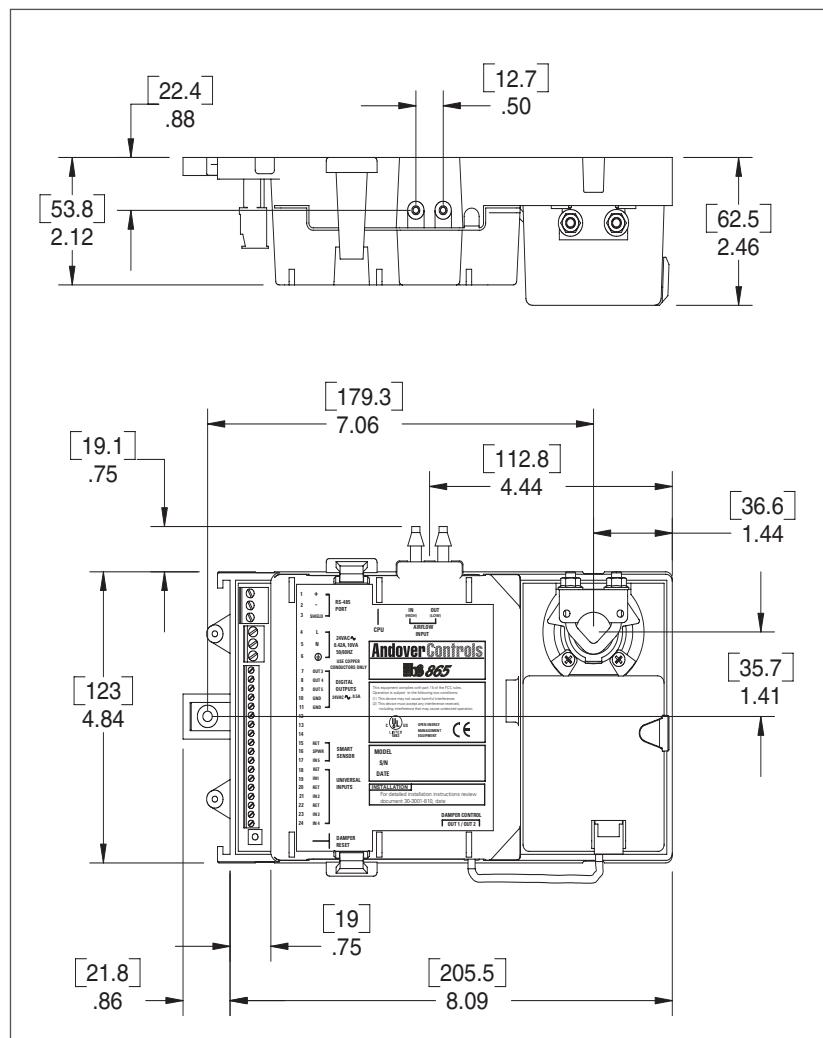
The input configuration on the b3865/866 consists of four full range Universal inputs that accept voltage (0-5VDC), digital (on/off), counter signals (up to 4Hz), or temperature signals, plus an on-board air flow sensor. Both models also offer an additional input to support the Andover Continuum Smart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

Outputs

The b3865/866 contains three Form A Triac-based outputs. Each Triac is ground referenced. 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 also offers two (0-10V) analog outputs.

Dimension Drawing



Andover Continuum b3865/866 VAV Controllers with Built-in Actuator

Features (continued)

Damper Actuator

The integrated Belimo® damper actuator allows simple direct mounting of the b3865/866 directly over the existing damper shaft. This eliminates the need for separate mounting, wiring, and positioning of the damper motor. All b3865/866 controllers have built-in software over-drive protection which senses repeated motor limit stall conditions and helps to prevent motor damage. Also, the actuator has a built-in clutch button to temporarily disengage the direct-drive gears during commissioning. The b3865/866 actuator may be preset for a limited range of motion using the mechanical “stops” provided.

Software Capabilities

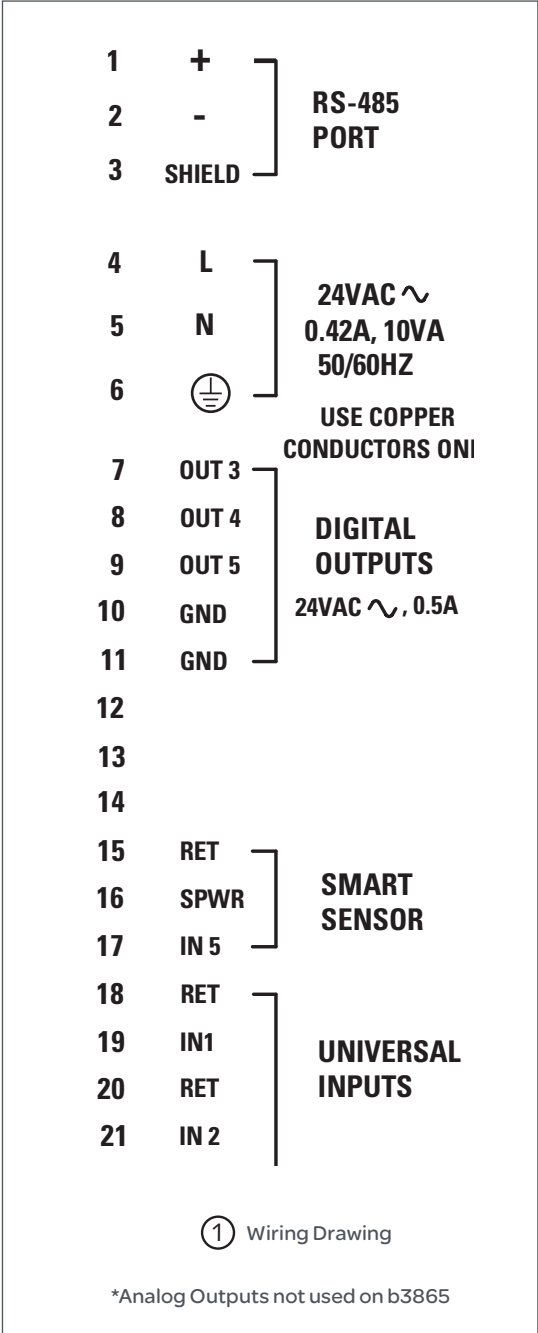
The dynamic memory of the b3865/866 can be allocated for any combination of programs, scheduling, alarming, and data logging using the powerful Andover Plain English programming language. Our object-oriented Plain English language with intuitive keywords provides an easy method to tailor the controller to meet your exact requirements. Programs are entered into the b3865/866 using the Andover Continuum CyberStation™. Programs are then stored and executed by the b3865/866.

Programming multiple b3865/866s is inherently easy with Plain English. A complete copy of one b3865/866’s programs can be loaded directly into other b3865/866s without changing any point names or programs.

Smart Sensor Interface

The b3865/866 provides a built-in connection for Andover Continuum Smart Sensor. The Smart Sensor provides a 2-character LED display and a 6-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 4-digit custom LCD that provides the following icons: PM, %, °, Setpoint, Cool, Heat, CFM, Fan, OA, and SP.

Dimension Drawing



Andover Continuum b3865/866 VAV Controllers with Built-in Actuator Specifications

b3865/866 VAV Controllers

Electrical

Power

24 VAC, +10% -15%, 50/60 Hz

Power Consumption

10 VA

Overload Protection

Fused with 2 amp fuse. MOV protected

Software Real-Time Clock

Synchronized through MS/TP via BACnet

Mechanical

Operating Environment

32°–120°F (0–49°C),

10–95% RH (non-condensing)

Size

5.59" H x 8.95" W x 2.46" D

(142H x 227W x 62) mm

Weight

1.86 lbs. (.85 kg)

Enclosure Type

UL Open class, IP 10.

Flammability rating of UL94-5V

Battery

Battery Backup

Replaceable, non-rechargeable, lithium battery. Provides 5 years typical accumulated power failure backup of RAM memory.

Communications

Communications Interface

RS-485 BACnet, MS/TP.

127 devices maximum

Communications Speed

9600, 19.2K, 38.4K, 76.8K baud

Bus Length

4,000 ft. (1,220m) standard;

BACnet repeater allows extension to longer distances.

Bus Media

Twisted, shielded pair,

low capacitance cable

BACnet Device Profile

B-AAC, BACnet Advanced

Application Controller

BTL Listed

B-AAC with Local Trends



Inputs

4 Universal inputs: Voltage

(0-5.115 VDC); Temperature -30°F to 230°F (-34°C to 110°C), Digital (on/off),

Counter (up to 4Hz at 50% duty cycle,

125 ms min. pulse width). Current input

(0 - 20 mA) using external 250 ohm resistor.

1 airflow sensor (0 to 2" W.C.)

1 Smart Sensor Temperature Input

(32°F to 105°F) (0°C to 41°C)

Input Voltage Range

0-5.115 volts DC

Input Impedance

10K ohm to 5.120V or 5M ohm

with pull-up resistor disabled

Input Protection

24 VAC or 24 VDC temporarily on any single channel, ±1000V transients (Tested according to EN61000-4-4)

Input Resolution

5.0 mV

Input Accuracy

±15mV (±0.56°C from -23°C to +66°C or ±1°F from -10°F to +150°F)

Airflow Input

Range: 0 to 2" W.C. (0-500 Pa)

Resolution: 0.005" W.C. (1.25 Pa)

@ 23° C (73° F)

Accuracy: ±0.05" W.C. (12.50 Pa)

@23°C (73°F)

Outputs

3 single pole single throw (SPST) Form A Triacs (any two consecutive outputs can be configured as one Tri-state Form K);

1 integrated damper actuator;

2 analog outputs (0-10V) (b3866 only)

Output Rating

For SPST: Maximum 0.5A, 24VAC, ±2000V transients (Tested according to EN61000-4-4) Minimum: 20 mA AC

Each Triac is ground referenced, DC loads not permitted.

For 0-10V: 5 mA maximum, 2K ohm minimum impedance, ±1000V transients (Tested according to EN61000-4-4)

Output Accuracy

For SPST: 0.1 sec. for pulse width modulation

For 0-10V: 50 mV resolution/100mV accuracy

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with Built-in Actuator

Specifications (continued)



b3865/866 VAV Controllers

Damper Actuator

Rated Torque
35 in-lb. (3.95 Nm)

Range of Travel
0-95 degrees, with adjustable mechanical stops

Rotation Speed
1.0 degree/sec nominal

Position Resolution
0.1 degrees with a 1.0 degree min. positioner movement

Actuator Output
1.0 sec minimum pulse duration

Shaft Accommodations
Accepts shafts 1/4" - 5/8" diameter (6.35mm - 15.9mm)

Connections

Power
3-position fixed screw terminal connector

Communications
3-position removable screw terminal connector

Inputs/Outputs/Smart Sensor
18-position fixed screw terminal connector

Damper Shaft
1/4" - 5/8" diameter (6.35mm - 15.9mm)

Service Port
4-position shrouded connector

User LEDs/Switches

Status Indicator LEDs
CPU CPU Active
TD Transmit Data
RD Receive Data

Switches
DAMPER LEARN
RESET
Input Pull-up Resistor Switch
(per input) Motor Direction Switch

General

Memory
128K SRAM, 1MB FLASH

Processor
Motorola 32-bit Coldfire

Agency Listings

UL/CUL 916, FCC CFR 47 Part 15, ICES-003, EN55022, AS/NZS 3548, and VCCI Class A, CE

Options

UL864, Smoke Control System Equipment, UUKL (b3865-S, b3866-S)