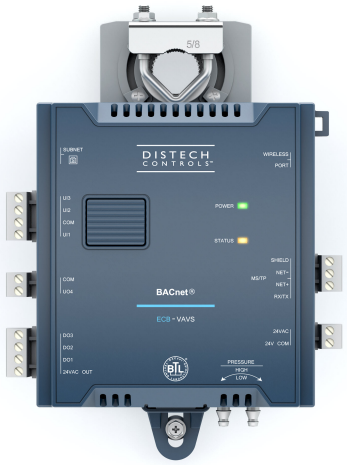
ECB-VAVS

BACnet B-ASC 9-Point
Programmable Controllers



Overview

The ECB-VAVS controllers are microprocessor-based programmable variable air volume (VAV) controllers designed to control cooling only and cooling with reheat single duct variable air volume boxes.

Each controller uses the BACnet® MS/TP LAN communication protocol and is BTL®-Listed as BACnet Application Specific Controllers (B-ASC).

Features & Benefits

- Internal power supply uses power factor correction (PFC) to optimize power usage when multiple controllers are connected at the same power transformer
- Flexible inputs and outputs support all industry-standard VAV unitary applications
- Rugged hardware inputs and outputs eliminate the need for external protection equipment
- Polarity free, on-board airflow sensor for precise airflow monitoring and control at low and high airflow rates
- Built-in actuator with an integrated position feedback system for worry-free operation
- Factory pre-loaded applications allow for out-of-the-box, energy efficient operation of standard VAV equipment
- Optimized air balancing through *my*DC AirBalancing saving time during the commissioning process
- Supports EC-*gfx*Program, making Building Automation System programming effortless
- Open-to-Wireless™ ready, supporting a wide variety of wireless sensors and switches and helping to reduce installation costs
- Supports the Allure™ Series Communicating Sensors, providing intelligent sensing and environmental zone control

Model Selection

Example: ECB-*VAVS (SI)*

Series	Model	Units
ECB-	***VAVS*** : 9 points, flow sensor, damper actuator, 3 UI, 3 DO, 1 UO	***(SI)*** : Preloaded Apps in SI (Metric) units ***(IMP)*** : Preloaded Apps in Imperial (US) units

Accessories

Terminal covers	Terminal cover designed to conceal the controller's wire terminals. Required to meet local safety regulations in certain jurisdictions.

Recommended Applications

Model	ECB-VAVS
Cooling Only VAV Boxes	■
Cooling with Reheat VAV Boxes	■
Room Pressurization	■

BACnet Objects List

BACnet Objects

Calendar Objects	1
Special events per calendar	25
Schedule Objects	2
Special events per schedule	5
PID Loop Objects	8

Commandable Objects

BV Objects	10
MSV Objects	10
AV Objects	25

Non-Commandable Objects

BV Objects	40
MSV Objects	40
AV Objects	75

Product Specifications

Power Supply Input

Voltage Range[1]	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	3.0A
Power Consumption	4 VA typical plus all external loads[2], 75 VA max (including powered triac outputs).

1. 24VDC does not support DO (triac outputs).
2. External loads must include the power consumption of any connected modules such as an Allure Series Communicating Sensor. Refer to the respective module's datasheet for related power consumption information.

Communications

Communication Bus	BACnet MS/TP
BACnet Profile	B-ASC[1]
EOL Resistor	Built-in, selectable
Baud Rates	9600, 19 200, 38 400, or 76 800 bps
Addressing	Dip switch or with an Allure EC-Smart-Vue Series Communicating Sensor

1. Refer to Distech Controls' Protocol Implementation Conformity Statement for BACnet.

Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum number of room devices supported per controller combined	4[1]

1. A controller can support a maximum of 2 Allure sensor models equipped with a CO_2 sensor. Any remaining connected sensors must be without a CO_2 sensor.

Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Applications Memory	384 kB Non-volatile Flash
Storage Memory	1 MB Non-volatile Flash
Memory (RAM)	64 kB RAM
Real Time Clock (RTC)	Built-in Real Time Clock without battery Network time synchronization is required at each power-up cycle before the RTC become available
Green LEDs	Power status & LAN Tx
Orange LEDs	Controller status & LAN Rx

Wireless Receiver

Communication Protocol	EnOcean wireless standard[1]
Number of Wireless Inputs[2]	18
Supported Wireless Receivers	Refer to the Open-to-Wireless Application Guide
Cable	Telephone cord
Connector	4P4C modular jack
Length (maximum)	6.5ft (2m)

1. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.
2. Some wireless modules may use more than one wireless input from the controller.

Integrated Damper Actuator

Motor	Belimo brushless DC motor
Torque	45 in-lb, 5 Nm
Degrees of Rotation	95º adjustable
Shaft Diameter	5/16 to 3/4”; 8.5 to 18.2mm
Acoustic Noise Level	< 35 dB (A) @ 95º rotation in 95 seconds

Mechanical

Dimensions (H × W × D)	7.90 × 5.51 × 3.70" (200.61 × 139.93 × 94.04 mm)
Dimensions with terminal block covers (H × W × D)	7.90 × 10.84 × 3.70" (200.61 × 275.26 × 94.04 mm)
Shipping Weight (Controller)	1.35lbs (0.61 kg)
Shipping Weight Terminal Cover (one side, bulk packaged)	0.30lbs (0.14 kg)
Enclosure Material[1]	FR/ABS
Enclosure Rating	Plastic housing, UL94-5VB flammability rating Plenum rating per UL1995

1. All materials and manufacturing processes comply with the RoHS directive and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive

Environmental

Operating Temperature	32°F to 122°F (0°C to 50°C)
Storage Temperature	-4°F to 122°F (-20°C to 50°C)
Relative Humidity	0 to 90% Non-condensing

Standards and Regulation

CE Emission	EN61000-6-3: 2007; A1:2011
CE Immunity	EN61000-6-1: 2007
FCC	Compliance with FCC rules part 15, subpart B, class B
UL Listed (CDN & US)	UL916 Energy management equipment
CEC Appliance Database	Appliance Efficiency Program[1]

1. California Energy Commission’s Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

On-Board Air-Flow Sensor

Differential Pressure Range	±2.0 in. W.C. (±500 Pa) Polarity-free high-low sensor connection
Input Resolution	0.00007 in. W.C. (0.0167 Pa)
Air Flow Accuracy	±4.0% @ > 0.05 in. W.C. (12.5 Pa) ±1.5% once calibrated through air flow balancing @ > 0.05 in. W.C. (12.5 Pa)
Pressure Sensor Accuracy	±(0.2 Pa +3% of reading)

Universal Inputs (UI)

General

Input Type	Universal; software configurable
Input Resolution	12-Bit analog / digital converter

Contact

Type	Dry contact

Counter

Type	Dry contact
Maximum Frequency	1Hz maximum
Minimum Duty Cycle	500ms On / 500ms Off

0 to 10VDC

Range	0 to 10VDC (40kΩ input impedance)

0 to 20mA

Range	0 to 20mA 165Ω external resistor wired in parallel

Resistance/Thermistor

Range	0 to 350 KΩ
Thermistor	10KΩ Type 2, 3 (10KΩ @ 77ºF; 25ºC)

Universal Outputs (UO)

General

Output Type	Universal; software configurable
Output Resolution	10-bit digital to analog converter
Output Protection	Built-in snubbing diode to protect against back-EMF, for example when used with a 12VDC relay Output is internally protected against short circuits
Load Resistance	Minimum 600 Ω for 0-10VDC and 0-12VDC outputs
Auto-reset fuse	Provides 24VAC over voltage protection

0 or 12VDC (On/Off)

Range	0 or 12VDC
Source Current	Maximum 10 mA at 12VDC or 20 mA at 11VDC

PWM

Range	Adjustable period from 2 to 65 seconds
Thermal Actuator Management	Adjustable warm up and cool down time

Floating

Minimum Pulse On/Off Time	500 milliseconds
Drive Time Period	Adjustable

0 to 10VDC

Range	0 to 10VDC
Source Current	Maximum 20 mA at 10VDC (minimum load resistance 600Ω)
Sink Current	Maximum 2.5mA at 1 VDC (minimum load resistance 4KΩ)

Digital Outputs (DO)

General

Output Type	24VAC Triac; software configurable
Maximum Current per Output	0.5A continuous 1A @ 15% duty cycle for a 10-minute period
Power Source	Internal power supply

0 or 24VAC (On/Off)

Range	0 or 24VAC

PWM

Range	Adjustable period from 2 to 65 seconds

Floating

Minimum Pulse On/Off Time	500 milliseconds
Drive Time Period	Adjustable
Power Source	Internal power supply

Dimensions

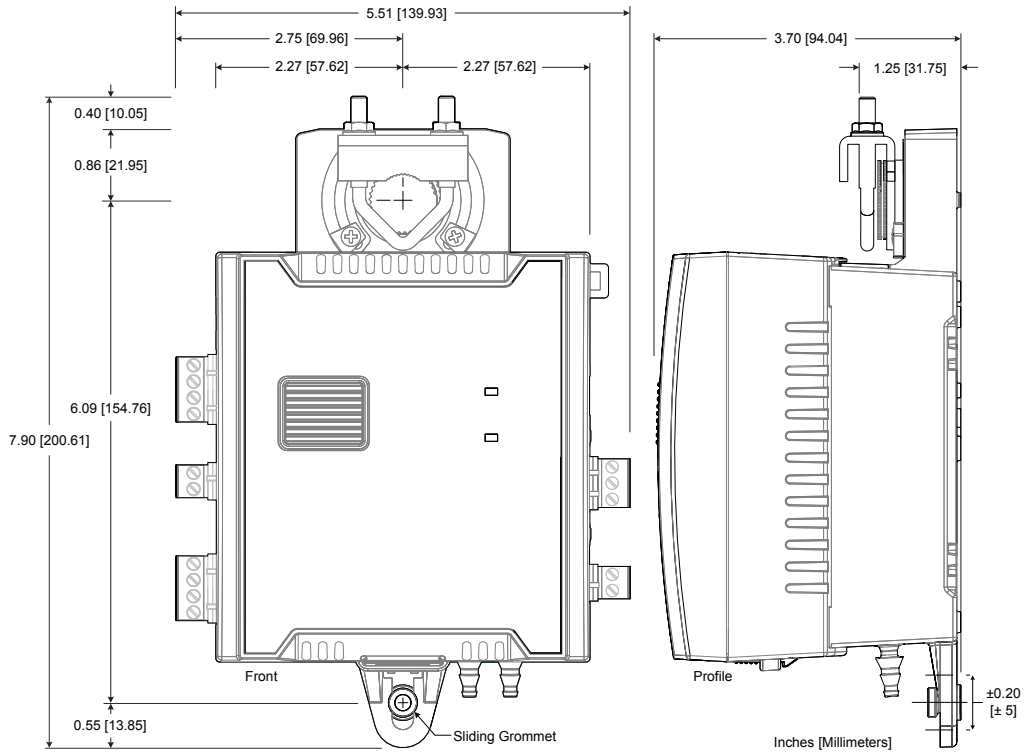


Figure 1: ECB-VAVS Controller Dimensions

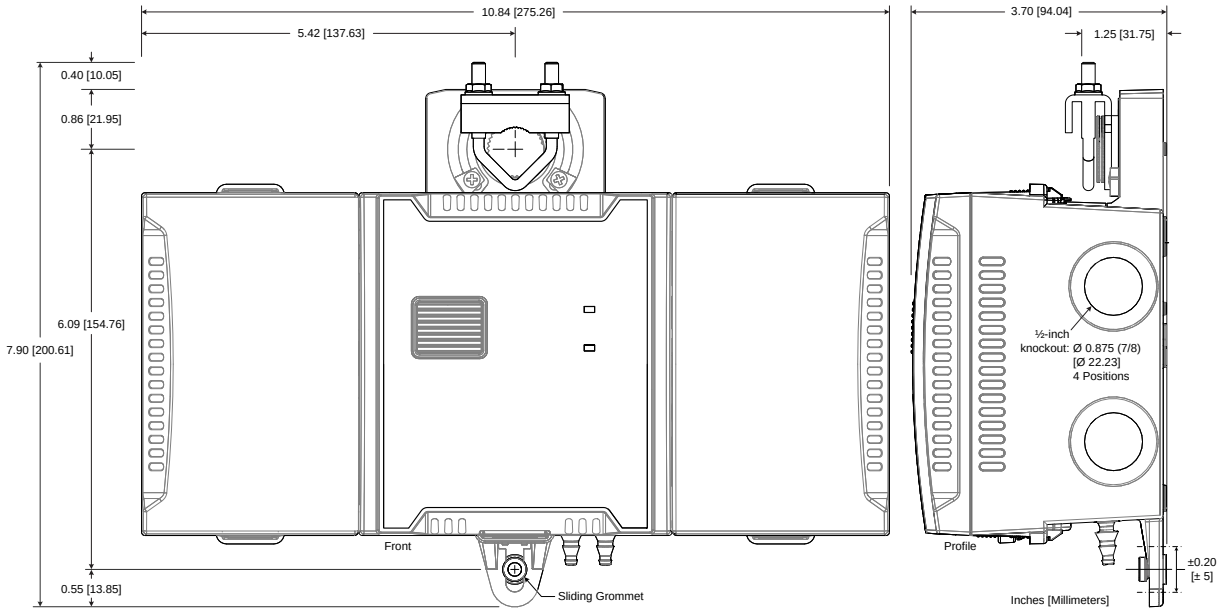


Figure 2: ECB-VAVS Controller with Terminal Covers Dimensions

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