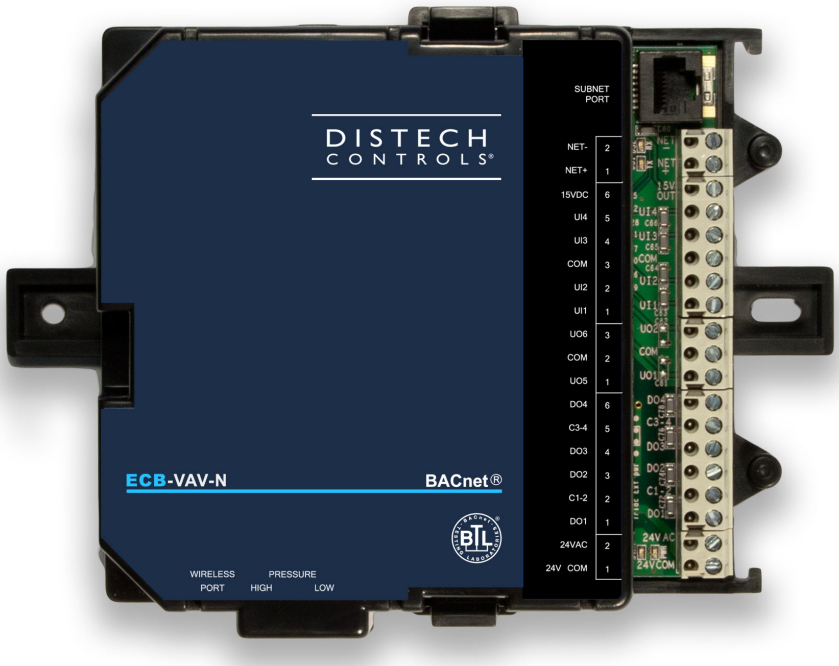
ECB-VAV-N



Overview

The ECB-VAV-N controller is a microprocessor-based programmable variable air volume (VAV) controller designed to control any variable air volume box that requires a separate damper actuator. This controller uses the BACnet® MS/TP LAN communication protocol and is BTL®-Listed as BACnet Application Specific Controllers (B-ASC).

Applications

This controller meets the requirements of the following applications:

- Large damper VAV box
- Existing damper actuator

Features & Benefits

Flexible Inputs and Outputs

This controller has various input types including resistance, voltage, and digital-based ones. Moreover, it provides digital, floating, pulse width modulation, and proportional control outputs for valves, heating elements, fans, and lighting applications. This controller covers all industry-standard HVAC unitary applications.

Highly Accurate Universal Inputs

Highly accurate universal inputs support thermistors and resistance temperature detectors (RTDs) that range from 0 Ohms to 350,000 Ohms, as well as support for inputs requiring 0 to 10VDC or 0 to 20mA with an external resistor. This provides the freedom of using your preferred or engineer-specified sensors, in addition to any existing ones.

Rugged Inputs/Outputs

Rugged hardware inputs and outputs eliminate need for external protection components, such as diodes for 12V DC relays.

Preloaded Applications

Factory preloaded applications allow these controllers, straight out of the box, to operate standard VAV equipment with a proven energy-efficient sequence of operation thereby eliminating the need for programming.

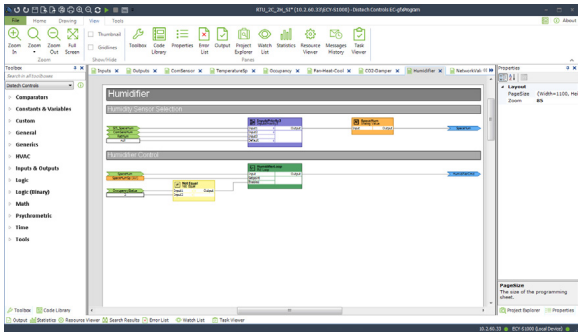
The preloaded application can be selected using an Allure EC-Smart-Vue sensor even before the network has been installed for rapid deployment or through the EC-Net™ solution using Distech Controls' *dcgfx*Applications.

Integrated VPACC

Integrated VAV Performance Assessment Control Charts (VPACC) control sequences, provides a means of automatically detecting when the VAV is operating outside of its design parameters including: Persistent High/Low Space Temperature, Persistent High/Low Discharge Temperature, Persistent High/Low Air Flow, and Unstable Air Flow.

Programmability

Supports Distech Controls' EC-*gfx*Program, which makes Building Automation System (BAS) programming effortless, by allowing you to visually assemble building blocks to create a custom control sequence for any HVAC / building automation application.



Increased Energy Efficiency

Improves energy efficiency when combined with:

- Motion detectors to automatically adjust a zone's occupancy mode from standby to occupied when presence is detected
- CO_2 sensors as part of a demand-controlled ventilation strategy that adjusts the amount of fresh air intake according to the number of building occupants

On-Board Air Flow Sensor

This controller is equipped with an accurate on-board airflow sensor for precise air flow monitoring and control at low and high air flow rates, allowing the design for maximum energy efficiency while maintaining an optimal comfort level.

The on-board air flow sensor has a range of 0 to 2 inches (5 cm) of water column (500 Pascal).

Optimized Air Balancing

Optimized air balancing process saves time during commissioning: the flow sensor requires no zero flow calibration, and its variable-speed motor goes to minimum and maximum flow position in half the time of typical VAV actuators.

Open-to-Wireless™ Solution

Open-to-Wireless™

The controllers are Open-to-Wireless™ ready, and when paired with the Wireless Receiver, work with a variety of wireless battery-less sensors and switches, to reduce the cost of installation and minimize the impact on existing partition walls. For supported frequencies in your area, refer to the Open-to-Wireless Solution Guide.

Available with an optional Wireless Receiver that supports up to 18 wireless inputs to create wire-free installations.

Allure™ Series Communicating Sensor Support

These controllers work with a wide range of sensors, such as the Allure Series Communicating Sensors that are designed to provide intelligent sensing and control devices for increased user experience and energy efficiency.

- Allure EC-Smart-Vue sensors feature a backlit-display and graphical menus that provide precise environmental zone control, with any combination of the following: temperature, humidity, CO_2, and motion sensor.
- Allure EC-Smart-Comfort sensors feature colored LED indicators to provide user feedback, rotary knobs to adjust the setpoint offset and fan speed, and an occupancy override push button.
- Allure EC-Smart-Air sensors combine precise environmental sensing in a discreet and alluring enclosure for temperature, humidity, and CO_2.

Supported Platforms

EC-Net Solution

The EC-Net multi-protocol integration solution is web-enabled and powered by the Niagara Framework, establishing a fully Internet-enabled, distributed architecture for real-time access, automation and control of devices. The EC-Net open framework solution creates a common development and management environment for integration of LonWorks®, BACnet® and other protocols. Regardless of manufacturer and protocol, the EC-Net system provides a unified modeling of diverse systems and data, providing one common platform for development, management and enterprise applications.

Model Attributes

Points	11-Point VAV
Universal Hardware Inputs	4
Built-in Flow Sensor	■
Wireless Inputs[1]	18
15 VDC Power Supply	■
Digital (triac) Outputs	4
Universal Outputs	2

1. All controllers are Open-to-Wireless ready. Available when an optional Wireless Receiver is connected to the controller. Some wireless sensors may use more than one wireless input from the controller.

Accessories

Terminal Block Cover	A cover designed to conceal the wire terminals. It is required to meet local safety regulations in certain jurisdictions.

BACnet Objects List

BACnet Objects List	
BACnet Calendar Objects	1
□ Special events per calendar	25
BACnet Schedule Objects	2
□ Special events per schedule	5
BACnet PID Loop Objects	8
BACnet BV Objects:	
□ Commandable	10
□ Non-Commandable	40
BACnet MSV Objects:	
□ Commandable	10
□ Non-Commandable	40
BACnet AV Objects:	
□ Commandable	25
□ Non-Commandable	75

Product Specifications

Power Supply Input

Voltage Range	24VAC/DC; ±15%; Class 2
Frequency Range	50/60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	2.0A
	3.0A (for triacs when using the internal power supply)
Power Consumption	10 VA typical plus all external loads[1], 85 VA max. (including powered triac outputs)

1. External loads must include the power consumption of any connected modules such as subnet devices, wireless module (1VA) and triac outputs.. 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, jumper 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.

Hardware

Processor	STM32 (ARM Cortex™ M3) MCU, 32 bit
CPU Speed	68 MHz
Memory	384 kB Non-volatile Flash (applications)
	1 MB Non-volatile Flash (storage)
	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
Status Indicator	Green LEDs: power status & LAN Tx
	Orange LEDs: controller status & LAN Rx

Subnetwork

Communication	RS-485
Cable	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum Number of Allure Series Communicating Sensors combined	4[1]

1. A controller can support a maximum of two Allure Series Communicating Sensor models equipped with a CO_2 sensor. The remaining connected Allure Series Communicating Sensor models must be without a CO_2 sensor.

Wireless Receiver[1]

Communication Protocol — EnOcean wireless standard

Number of Wireless Inputs[2] — 18

Supported Wireless Receivers — Refer to the Open-to-Wireless Solution Guide

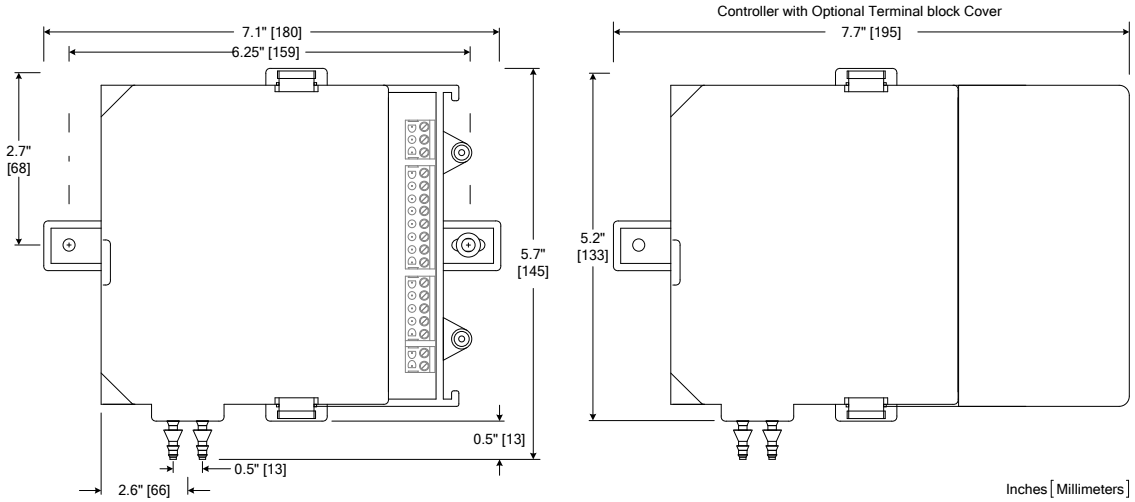
Cable — Telephone cord

- 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 Solution Guide for a list of supported EnOcean wireless modules.
2. Some wireless modules may use more than one wireless input from the controller.

Mechanical

Dimensions — 5.7 x 7.1 x 2.13” (145 x 180 x 54.0 mm)



Shipping weight — 0.92 lbs (0.42 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 Regulations

CE:

- Emission — EN61000-6-3: 2007; A1:2011; Generic standards for residential, commercial and light-industrial environments
- Immunity — EN61000-6-1: 2007; Generic standards for residential, commercial and light-industrial environments

FCC — This device complies with FCC rules part 15, subpart B, class B

UL Listed (CDN & US) — UL916 Energy management equipment

Specifications - On-Board Air Flow Sensor

Range — 0-2.0 in. W.C. (0-500 Pa)
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)

Specifications - Universal Inputs (UI)

General

Input Type — Universal; software configurable
Input Resolution — 16-bit analog / digital converter
Power Supply Output — 15VDC; maximum 80mA

Contact

Type — Dry contact

Counter

Type — Dry contact
Maximum Frequency — 1Hz maximum,
Minimum Duty Cycle — 500milliseconds On / 500milliseconds Off

0 to 10VDC

Range — 0 to 10VDC (40kΩ input impedance)

0 to 5VDC

Range — 0 to 5VDC (high input impedance)

0 to 20mA

Range — 0 to 20mA
249Ω external resistor wired in parallel

Resistance/Thermistor

Range — 0 to 350 KΩ
Supported Thermistor Types — Any that operate in this range
Pre-configured Temperature Sensor Types:

- Thermistor — 10KΩ Type 2, 3 (10KΩ @ 77ºF; 25ºC)
- Platinum — Pt1000 (1KΩ @ 32ºF; 0ºC)
- Nickel — RTD Ni1000 (1KΩ @ 32ºF; 0ºC)

RTD Ni1000 (1KΩ @ 69.8ºF; 21ºC)

Specifications - 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 protection from accidental 24VAC connection

0 or 12VDC (On/Off)

Range — 0 or 12VDC

Source Current — Maximum 20 mA at 12VDC (minimum load resistance 600Ω)[1]

1. Relays equipped with coil that consume between 20 and 35mA can be used with up to 2 Universal Outputs when the 15V Power Supply Output is de-rated to supply 50mA maximum current.

PWM

Range — Adjustable period from 2 to 65seconds

Thermal Actuator Management — Adjustable warm up and cool down time

Floating

Minimum Pulse On/Off Time — 500milliseconds

Drive Time Period — Adjustable

0 to 10VDC

Voltage Range — 0 to 10VDC linear

Source Current — Maximum 20 mA at 10VDC (minimum load resistance 600 Ω)

Specifications - Digital Output (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 — External or internal power supply (jumper selectable)

0 or 24VAC (On/Off)

Range — 0 or 24VAC

PWM

Range — Adjustable period from 2 to 65seconds

Floating

Minimum Pulse On/Off Time — 500milliseconds

Drive Time Period — Adjustable

Power Source — External or internal power supply (jumper selectable)