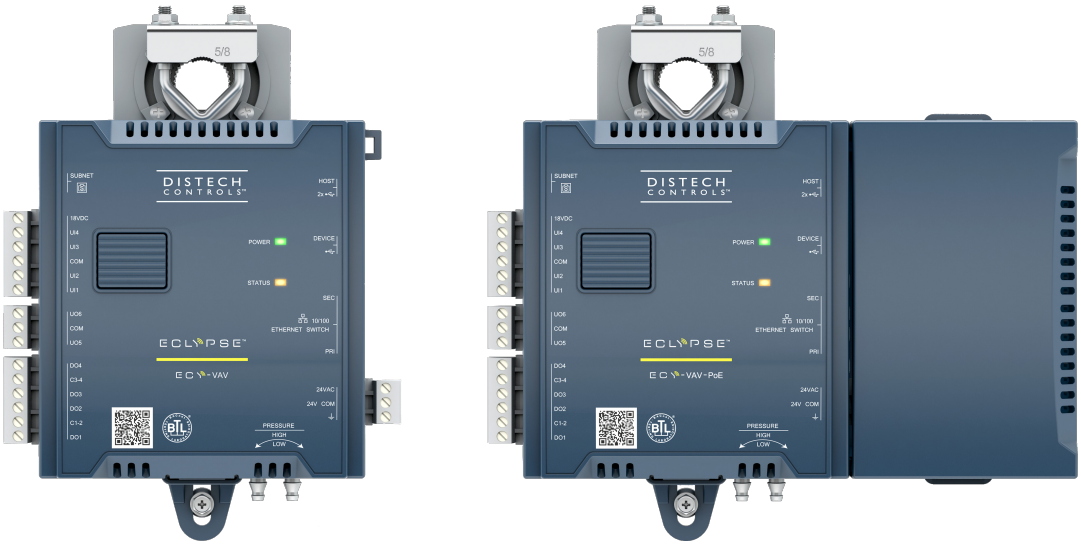
ECLYPSE™ Connected VAV Controller



ECLYPSE™

Overview

The ECLYPSE Connected VAV Controller (ECY-VAV) is designed to control any variable air volume (VAV) box. It supports BACnet/IP communication and is a listed BACnet Building Controller (B-BC).

The ECY-VAV comes with an embedded web server that enables web-based VAV application configuration and a visualization interface. It also features embedded scheduling, alarming, and logging. Control logic and graphic user interface can be customized as required for the application.

Applications

The ECY-VAV meets VAV zone application requirements, including:

- Cooling with Reheat VAV Box & Perimeter Heating
- Parallel Fan VAV Box
- Series Fan VAV Box
- Room Pressurization

Features & Benefits

Connectivity

The different types of connections supported by the ECY-VAV are as follows:

IP wired connection (ECY-VAV Model)

Internal switch with two Ethernet ports allows the controllers to be wired in a star or daisy-chain topology. With a daisy-chain topology:

- Fewer wire runs to a centralized switch are required, thereby achieving installation and cost reduction.
- A laptop can be connected to the second Ethernet port for direct programming, configuration, and commissioning using EC-*gfx*Program or ENVYSION.

IP wireless (Wi-Fi) connection

- Wi-Fi Client - Connection to the building's existing Wi-Fi network or to another controller's Wi-Fi Hotspot or Access Point.
- Wi-Fi Access Point - extending the building's wired IP network to your Wi-Fi Client devices.
- Wi-Fi Hotspot - your own wireless area network, for wireless communication between the controllers, or with a mobile device or laptop for configuration, commissioning and servicing.

Both IP wired and wireless (Wi-Fi) connection

The availability of both Ethernet ports and USB ports for the Wi-Fi Adapter, allows for simultaneous wired IP and Wi-Fi communication on the same controller, which means you can choose and combine these connection methods. For example, Wi-Fi can be used between two controllers to jump a large atrium.

Connect from anywhere

Control technicians, facility managers, occupants, and others can easily connect to the system, on-site or off-site, using the different available tools:

- ENVYSION to create and view the graphical interface
- EC-*gfx*Program to create custom control sequences
- *my*DC Control to view, edit, and configure system operating parameters

IP Communication

- Increased speed and improved handling of numerous trend logs that enable applications, such as advanced analytics that require a large amount of data.
- Experience faster response and save time when programming, configuring, creating and viewing graphics, and upgrading your system.
- Control technicians can connect the ECLYPSE Wi-Fi Adapter to the ECY-VAV thereby creating a Wi-Fi Hotspot network. The control technician can then connect wirelessly to the system using a mobile device or laptop, for faster, easier system configuration, programming, commissioning, and servicing.
- Hostname management allows the controller to be addressed by a nickname to facilitate network management.

Open to Web Services

With the RESTful API, the ECY-VAV's data can be accessed from different applications, such as energy dashboards, analytics tools, and mobile applications. The RESTful API documentation explains the implementation protocol for this interface.

Preloaded Application and Graphics

Faster programming and configuration

The ECY-VAV is a plug and play device that saves time and money since no programming or graphic design is needed as it comes with ENVYSION™ Viewer and the associated preloaded applications and graphics are pre-installed.

All standard VAV applications, such as single duct, series fan, and parallel fan, are included.

Direct web access

Also, no additional tools are required; only a web-browser is needed when you are using the pre-loaded application through ENVYSION. An Allure™ EC-Smart-Vue sensor can also be used. However, if the pre-loaded application does not meet the application requirements, it is possible to use EC-*gfx*Program to program it.

HTML5 Visual Interface

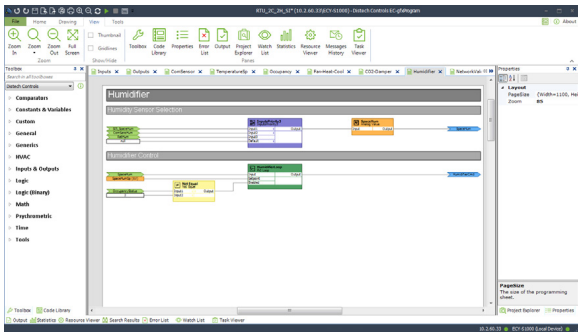
The ECY-VAV comes embedded with ENVYSION Viewer and xpressENVYSION.

ENVYSION Viewer – Web-based graphical user interface

The embedded ENVYSION viewer provides fast loading of visual applications through native web pages with absolutely no browser plug-ins. Host and view preloaded graphics, and access schedules, alarms, and trend logs directly from your ECY-VAV.

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 , lighting, or building automation application.



Batch EC-*gfx*Program Projects and Firmware Download

EC-*gfx*Program projects can be downloaded in batch to multiple controllers, for greater time savings. Batch firmware update can also be performed on multiple controllers.

Simplified Network Commissioning

The Xpress*Network* Utility saves you time and expense by giving you increased control over multiple ECLYPSE controllers through device discovery and batch operations such as configuring, programming, and updating multiple ECLYPSE controllers on the network.

In addition, with the embedded step by step Commissioning Wizard, all configuration operations can be setup and applied in one go.

Increase productivity using the xpress*Network* Companion mobile app, making it easier to identify and locate a controller on the network. Use the QR Code marked on ECLYPSE controllers to easily collect key controller data and to facilitate its network integration with xpress*Network* Utility.

Scalable and Modular

An ECY-MBUS communication module can be connected via USB to add one M-Bus port for meter integration, thus eliminating the need for a third-party gateway (from M-Bus to BACnet/IP).

BACnet/IP Device

The ECY-VAV is BTL-listed as a BACnet Building Controller (B-BC) and is certified WSP B-BC (Europe) and AMEV AS-A & AS-B (German-speaking countries). It supports BACnet/IP for faster communication in comparison to the traditional twisted pair communication bus.

FIPS 140-2 Level 1 Compliant

FIPS 140-2 Level 1 compliance provides an enhanced level of security to protect data the controller is collecting and sharing making it suitable for use in the most sensitive environments.

Weather Forecast

The weather forecast is directly available from the internet to be shown on a connected ECx-Display or to be used by the controller's code.

Smart Room Control Support

The Smart Room Control solution is an end-to-end system for the control of HVAC equipment, lighting, and shades/sunblinds, achieving the highest levels of comfort for occupants while cutting costs from installation time and wiring/material requirements to energy consumption. This solution combines:

- Lighting and shade/sunblind expansion modules to control lights (on/off or dimming) and shades/sunblinds (up/down and angle rotation).
- Multi-sensor combining motion and luminosity (Lux) sensors and an Infrared receiver that works with a convenient remote control.
- The ECLYPSE platform is compatible with Distech Controls line of *Bluetooth*® low energy technology enabled devices (Allure UNITOUCH™ and EC-Multi-Sensor-BLE) and mobile application providing state-of-the-art occupant management.
- Allure™ Series Communicating room sensors for increased occupant comfort settings using integrated sensors for temperature, humidity, CO_2, and motion.

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
- ☐ Allure EC-Smart-Comfort
- ☐ Allure EC-Smart-Air
- ☐ Allure UNITOUCH

Mobility

The controller can be remotely accessed to program, configure, or maintain the installation thus reducing costs associated with on-site visits. Through a mobile device or PC, a range of tasks can be performed using the following free-to-use tools and interfaces:

- ☐ ENVYSION web-based graphic design and visualization interface
- ☐ EC-*gfx*Program graphical programming interface
- ☐ *my*DC Control mobile application

Robust Hardware Design

This Controller features metallic pitot terminal barbs instead of the common plastic ones. This makes the input more robust and prevents damage to the barbs when connecting and disconnecting the pitot tubes. The anchor point and mounting bracket are also metallic, making the mounting more solid.

Alarms, Trend Log, Schedule Support

Embedded alarms, trend log and schedule support allows for fully distributed data and logic providing a more robust system. Embedded trend logs simplify system troubleshooting when compared to a centralized system.

Email Notifications Service

Technicians & facility managers can receive automatic email notifications for system status and alarms to ensure faster system servicing and response time. Email notification text can be customized to provide pertinent information about the issue at hand.

Model Selection

Connected VAV Controller

				
Model	ECY-VAV (SI)	ECY-VAV (IMP)	ECY-VAV-PoE (SI)	ECY-VAV-PoE (IMP)
Points	11-Point VAV	11-Point VAV	11- Point VAV	11- Point VAV
Power supply input	■	■		
Power Over Ethernet			■	■
Universal hardware inputs	4	4	4	4
Built-in flow sensor (±500Pa, ±2.0” w.c.)	■	■	■	■
18 Vdc power supply	■	■	■	■
Universal output	2	2	2	2
Digital (triac) outputs	4	4	4	4
Integrated damper actuator (45 in-lb, 5 Nm)	■	■	■	■
ENVYSION Viewer	■	■	■	■
Preloaded Apps in SI (Metric) units	■		■	
Preloaded Apps in Imperial (US) units		■		■

Accessories

ECLYPSE Wi-Fi Adapter	Wi-Fi Adapter for ECLYPSE Connected Controllers.
Terminal covers	Terminal cover designed to conceal the wire terminals of the ECY-VAV Series controllers. Required to meet local safety regulations in certain jurisdictions.

Product Specifications

Power Supply Input (ECY-VAV Models)

Voltage Range[1] — 24VAC/DC; ±15%; Class 2

Power Consumption:

Nominal — 7VA; all external loads excluded, no USB peripherals

Full Load — 20VA; external 24VAC loads excluded

Frequency Range — 50 to 60Hz

Overcurrent Protection — Field replaceable fuse

Fuse Type — 3A, fast-acting, 5 × 20mm (GMA-3A)

Power Factor — >90%

1. 24VDC does not support DO (triac outputs).

Power Supply Input (ECY-VAV-PoE Models)

Power over Ethernet Link Powered — IEEE 802.3at

PoE Switch — Must be listed as Limited Power Source (LPS) per UL60905

Overcurrent Protection — Field replaceable fuse

Fuse Type — 3A, fast-acting, 5 × 20mm (GMA-3A)

Powering External Devices — Up to 15 Watts maximum (power is available from the controller's power supply input terminals)

Communications

Ethernet Connection Speed — 10/100 Mbps

- ☐ Addressing — IPv4 or Hostname

BACnet Listing — BTL, WSP B-BC

BACnet Interconnectivity — BBMD forwarding capabilities

BACnet Profile — BACnet Building Controller (B-BC), AMEV AS-A and AS-B

BACnet Transport Layer — IP

Web Server Protocol — HTML5

Web Server Application Interface — REST API

Supported Wireless Connectivity:

- ☐ Wireless Adapter — Optional, USB Port Connection
- ☐ Wi-Fi Communication Protocol — IEEE 802.11b/g/n and 802.11s
- ☐ Wi-Fi Network Types — Client, Access Point, Hotspot

Subnetwork

Communication — RS-485

Cable — Cat 5e, 8 conductor twisted pair

Connector — RJ-45

Connection Topology — Daisy-chain

Maximum number of standard devices supported per controller combined — 4[1]

- ☐ Allure EC-Smart-Vue Series[2]
- ☐ Allure EC-Smart-Air Series[2]
- ☐ Allure EC-Smart-Comfort Series
- ☐ EC-Multi-Sensor Series

Maximum number of expansion modules supported per controller combined — 4[1]

- ECx-Light-4 / ECx-Light-4D / ECx-Light-4DALI
- ECx-Blind-4 / ECx-Blind-4LV

Maximum number of Bluetooth low energy devices per controller combined — 4

- Allure UNITOUCH — 2
- EC-Multi-Sensor-BLE — 4

A mixed architecture with standard room devices and Bluetooth low energy enabled devices is not recommended.

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.
2. For more information regarding supported quantities, see the ECLYPSE User Guide available on SmartSource.

Hardware

Processor — Sitara ARM processor

CPU Speed — 600MHz

Memory — 4GB Non-volatile Flash (applications & storage)
512MB RAM

Real Time Clock (RTC) — Real Time Clock with rechargeable battery
Supports SNTP network time synchronization

RTC Battery — 20 hours charge time, 20 days discharge time
Up to 500 charge / discharge cycles

Cryptographic Module — FIPS 140-2 Level 1 Compliant

Communications Ports:

- Ethernet (ECY-VAV Models) — 2 switched RJ-45 Ethernet ports
  Integrated fail-safe for daisy-chaining — In case of power failure to one of the controllers, communication data is still relayed to the following controller on the daisy-chain
- Ethernet (ECY-VAV-PoE Models) — 1 × RJ-45 PoE Ethernet port plus
  1 switched RJ-45 Ethernet port
- USB Connections — 2 × USB 2.0 Ports
  1 × Micro-USB 2.0 Port
- Subnet — RJ-45

Status Indicators — Green LED: Power status, Subnet TX, and Ethernet Traffic
Orange LED: Controller status, Subnet RX, and Ethernet Speed

Integrated Damper Actuator

Motor — Belimo brushless DC motor

Torque — 45 in-lb, 5 Nm

Degrees of Rotation — 95º adjustable

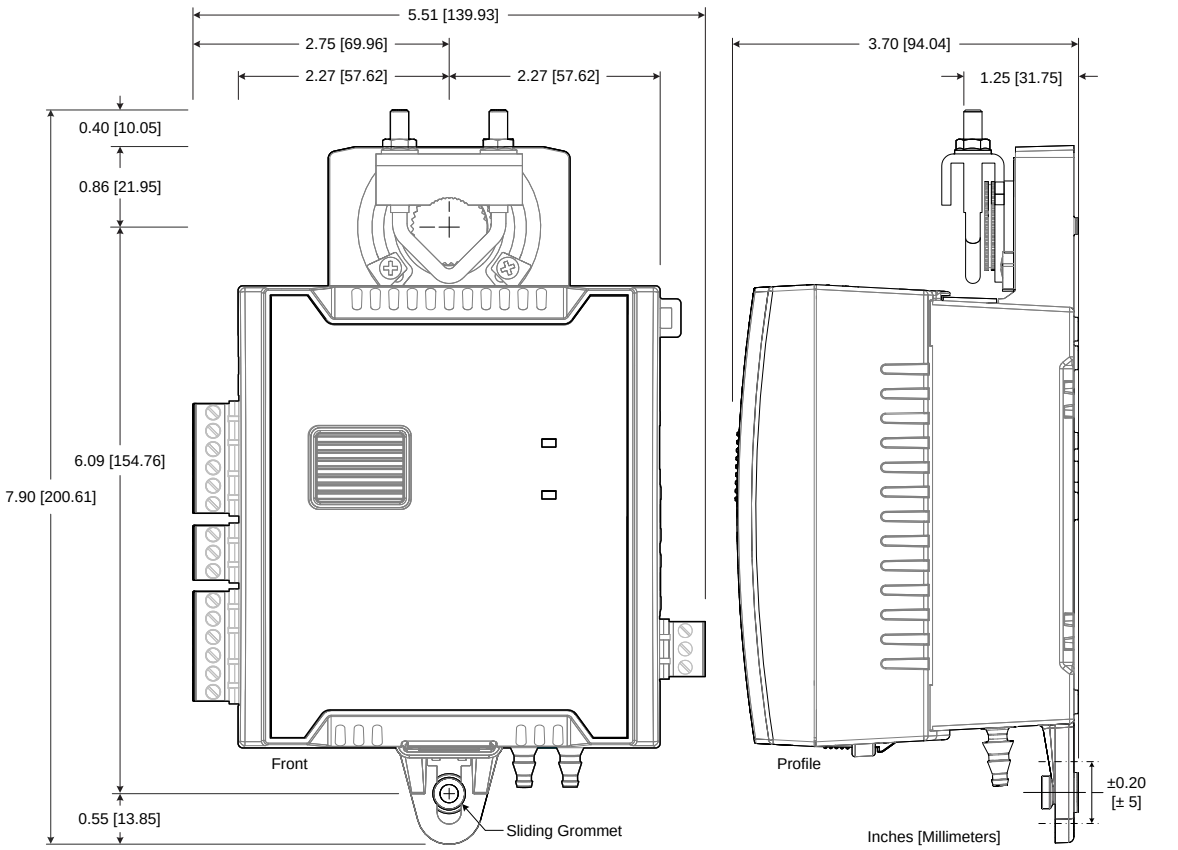
Shaft Diameter — 5/16 to 3/4”; 8.5 to 18.2mm

Acoustic Noise Level — < 35 dB (A) @ 95º rotation in 95 seconds

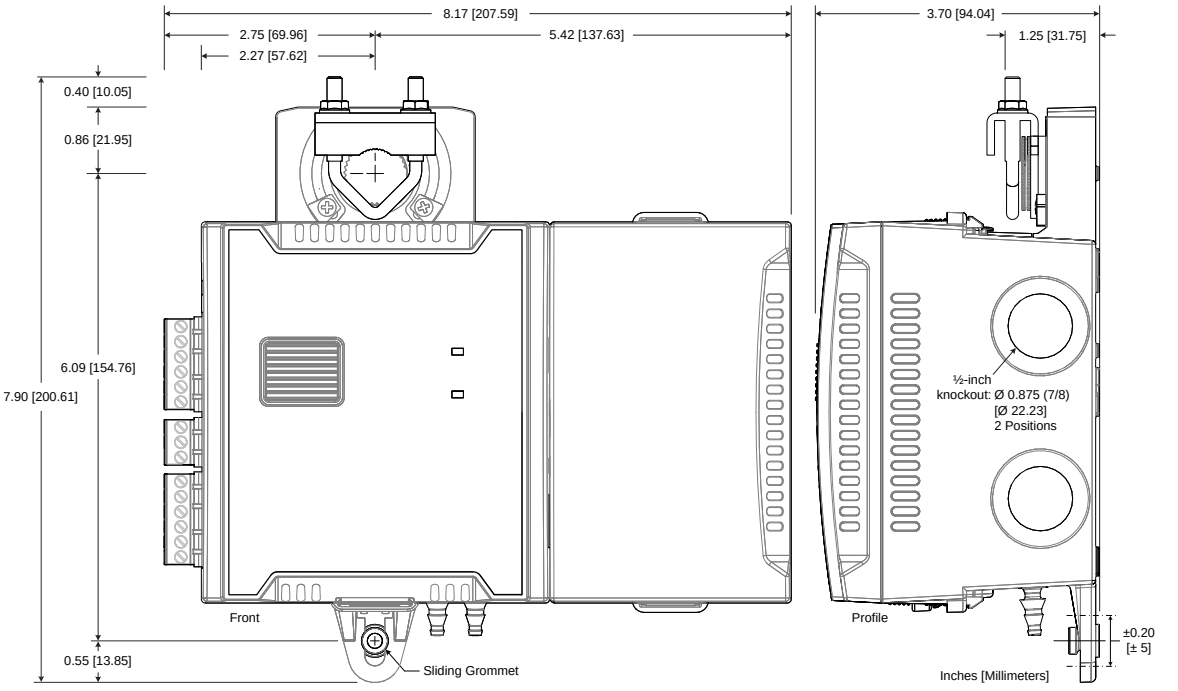
Mechanical

Dimensions:

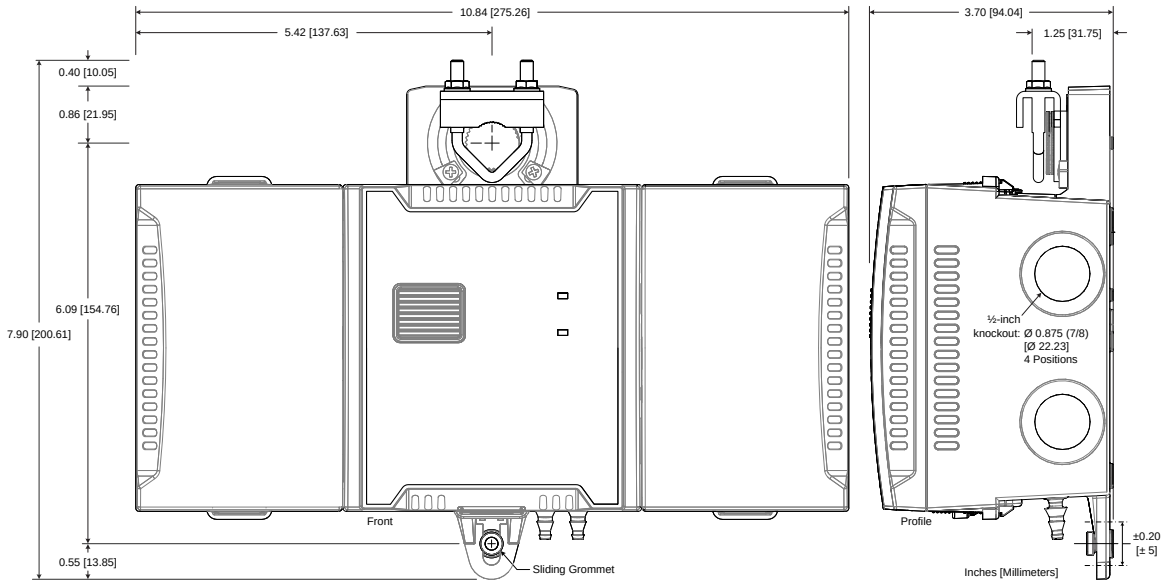
- ECY-VAV Model (H × W × D) — 7.90 × 5.51 × 3.70" (200.61 × 139.93 × 94.04 mm)



□ ECY-VAV-PoE Model (H × W × D) ——— 7.90 × 8.17 × 3.70" (200.61 × 207.59 × 94.04 mm)



□ With Terminal Covers (H × W × D) ——— 7.90 × 10.84 × 3.70" (200.61 × 275.26 × 94.04 mm)



Shipping Weight:

- ECY-VAV Model — 2.00lbs (0.90 kg)
- ECY-VAV-PoE Model — 2.50lbs (1.14 kg)
- 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 to 122°F (0 to 50°C)

Storage Temperature — -4 to 122°F (-20 to 50°C)

Relative Humidity — 0 to 90% non-condensing

Ingress Protection Rating — IP20 in accordance with IEC 60552

Nema Rating — 1

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

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)

Specifications – Universal Inputs (UI)

General

Input Type — Universal; software configurable
Input Resolution — 16-bit analog to digital converter
Power Supply Output — 18-20VDC; 80mA maximum
Protection — Auto-reset fuse for 24VAC protection

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
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 resistance 600Ω)

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

Source:

- Voltage Range — 0 to 10VDC linear
- Source Current — Maximum 20 mA at 10VDC (minimum resistance 600Ω)

Sink:

- Voltage Range — 0 to 10VDC linear[1]
- Sink Current — Maximum 2.5 mA at 1VDC (minimum resistance 4kΩ)

1. When the VAV is not powered, there is no default sink voltage.

Specifications – Digital Outputs (DO)

General (ECY-VAV Models)

Output Type — 24VAC Triac; software configurable

Maximum Total Current for all Outputs — 2A

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

Maximum Current per Output — 0.5A continuous

1A @ 15% duty cycle for a 10-minute period

General (ECY-VAV-PoE Models)

Output Type — 24VAC Triac; software configurable

Power Source — Internal / external (jumper selectable)

Internal Power Source:

- Network Switch — 802.3at
- Maximum Total Power for all Digital Outputs — 15W
- Maximum Current per Output — 0.5A continuous, power supply limited
- Waveform — 24 VAC square wave

External Power Source — 24VAC from external source

- Maximum Current per Output — 0.5A continuous

1A @ 15% duty cycle for a 10-minute period

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

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