ECLYPSE™ Connected VAV Controller

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.

Features & Benefits

- Uses BACnet/IP and IT standards, delivering empowered IP connectivity and open integration with building management systems
- Uses cryptographic modules making it FIPS 140-2 "Inside"
- Via its RESTful API, data can be accessed from different applications, such as energy dashboards, analytics tools, and mobile applications
- Comes with ENVYSION Viewer and the associated preloaded rooftop unit applications and graphics pre-installed
- xpressENVYSION offers a simplified and streamlined experience in a workflow oriented, drag & drop GUI environment
- Supports EC-*gfx*Program, which makes Building Automation System (BAS) programming effortless
- Supports Smart Room Control for an end-to-end system for the control of HVAC equipment, lighting, and shades/sunblinds
- Embedded alarms, trend log and schedule support allows for fully distributed data and logic providing a more robust system
- Automatic email notifications for system status and alarms to ensure faster system servicing and response time
- Robust hardware design featuring metallic pitot terminal barbs as well as metallic anchor point and mounting bracket
- ECLYPSE edge analytics automates the commissioning process, saving up to 30-45 minutes per device

Model Selection

Example: ECY-VAV ***(SI)***

ECY-VAV ***(IMP) Plenum-rated***

Series[1]	Model	Units	Option
ECY-VAV	[blank] : Standard 24VAC/DC power supply ***-PoE*** : Power Over Ethernet	***(SI)*** : Preloaded Apps in SI (Metric) units ***(IMP)*** : Preloaded Apps in Imperial (US) units	***Plenum-rated*** : UL2043 plenum-rated with standard 24VAC/DC power supply (only for North America, not available with PoE model).
11-points, 4 UI, 2 UO, 4 DO, 18 Vdc power supply output, built-in flow sensor, integrated damper actuator, ENVYSION viewer			

1. SEP models (single Ethernet port) have secondary Ethernet port factory disabled

Accessories

ECLYPSE Wi-Fi Adapter	Wi-Fi Adapter for ECLYPSE Connected Controllers.
ECLYPSE Open-To-Wireless™ Adapter	EnOcean communication protocol 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
Nominal Power Consumption	7VA; all external loads excluded, no USB peripherals
Full Load Power Consumption	20VA; external 24VAC loads excluded
Frequency Range	50 to 60Hz
Overcurrent Protection	Field replaceable fuse
Fuse Type	3A, fast-acting, 5 × 20mm (GMA-2A)
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-2A)
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
Cable Type	Cat 5e, 8 conductor twisted pair (unshielded)
Addressing	IPv4 or Hostname
BACnet Profile	BACnet Building Controller (B-BC), AMEV AS-A and AS-B
BACnet Listing	BTL, WSP B-BC
BACnet Interconnectivity	BBMD forwarding capabilities
BACnet Transport Layer	IP
Web Server Protocol	HTML5
Web Server Application Interface	REST API
Wireless Adapter	Optional, USB Port Connection
Wi-Fi Communication Protocol	IEEE 802.11b/g/n
Wi-Fi Network Types	Client, Access Point, Hotspot

Subnetwork

Communication	RS-485
Cable Type	Cat 5e, 8 conductor twisted pair
Connector	RJ-45
Connection Topology	Daisy-chain
Maximum number of standard room devices supported per controller combined [1]	4
Allure EC-Smart-Vue Series[2]	4
Allure EC-Smart-Comfort Series	4
Allure EC-Smart-Air Series[2]	4
EC-Multi Sensor	4
ECx-Light-4 / ECx-Light-4D / ECx-Light-DALI [1]	4
ECx-Blind-4 / ECx-Blind-4LV [1]	4
Maximum number of Bluetooth low energy room devices per controller combined [3]	4
Allure UNITOUCH™	2
EC-Multi-Sensor-BLE	4

1. For more details about supported quantities, see the ECLYPSE Selection Tool.xlsm spreadsheet file available for download on the Documentation and Resources Portal.
2. 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.
3. A mixed architecture with standard room devices and Bluetooth low energy enabled devices is not recommended.

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
Ethernet (ECY-VAV)	2 × switched RJ-45 Ethernet ports with integrated fail-safe for daisy-chaining
Ethernet (ECY-VAV-PoE)	1 × RJ-45 PoE+ Ethernet port 1 × switched RJ-45 Ethernet port
USB Connections	2 × USB 2.0 Ports 1 × Micro-USB 2.0 Ports
Subnet	RJ-45
Green LED	Power status, Subnet TX, and Ethernet Traffic
Orange LED	Controller status, Subnet RX, and Ethernet Speed

Open-to-Wireless Adapter

Communication Protocol	EnOcean wireless standard [1]
Connector Type	USB
Number of Wireless Inputs	Unlimited[2]

1. Available when an optional external ECLYPSE Open-to-Wireless Adapter is connected to the controller. Refer to the Open-to-Wireless Application Guide for a list of supported EnOcean wireless modules.
2. Wireless inputs will only be limited by physical distance between the EnOcean devices and the ECLYPSE Open-to-Wireless Adapter.

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

ECY-VAV Dimensions (H × W × D)	7.90 × 5.51 × 3.70" (200.61 × 139.93 × 94.04 mm)
ECY-VAV-PoE Dimensions (H × W × D)	7.90 × 8.17 × 3.70" (200.61 × 207.59 × 94.04 mm)
Dimensions with Terminal Covers (H × W × D)	7.90 × 10.84 × 3.70" (200.61 × 275.26 × 94.04 mm)
ECY-VAV Shipping Weight	2.00lbs (0.90 kg)
ECY-VAV-PoE Shipping Weight	2.50lbs (1.14 kg)
Terminal Cover Shipping Weight (one side, bulk packaged)	0.30lbs (0.14 kg)
Enclosure Material[1]	FR/ABS
Enclosure Rating	Plastic housing, UL94-5VB flammability rating

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 (IEC 60552)
Nema Rating	1

Standards and Regulations

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 UL2043 Suitable for use in air handling spaces (for Plenum-rated models only)

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	16-bit analog to digital converter
Power Supply Output	18VDC; 80mA maximum
Protection	Auto-reset fuse for 24VAC protection

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 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)

Universal Outputs (UO)

General

Output Type	Universal; software configurable
Output Resolution Converter	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 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

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.

Digital Output (DO)

General (ECY-VAV Models)

Output Type	24VAC Triac; software configurable
Maximum Total Current for all Outputs	2A
Power Source,	External or internal (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	External or internal (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

Voltage	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 65 seconds

Floating

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

Dimensions

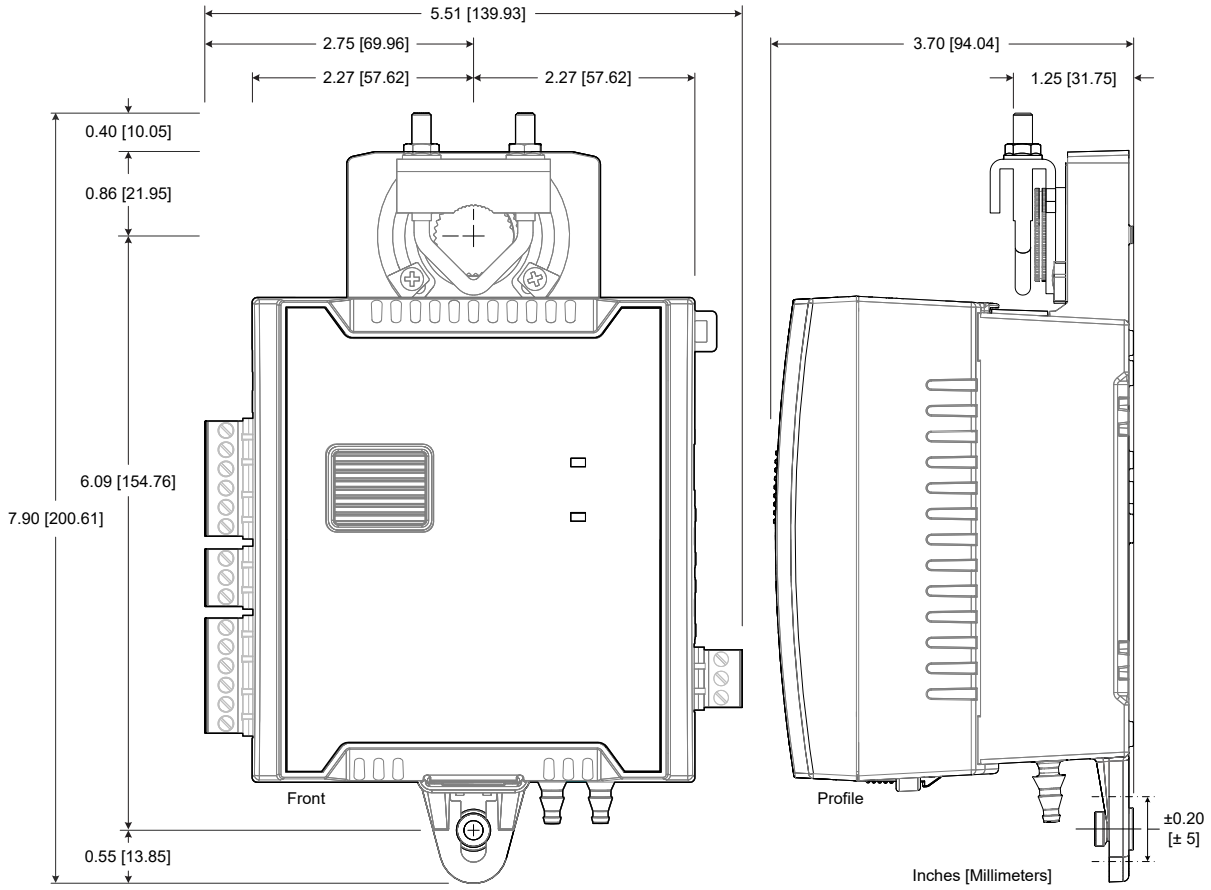

Figure 1: ECY-VAV Controller Dimensions

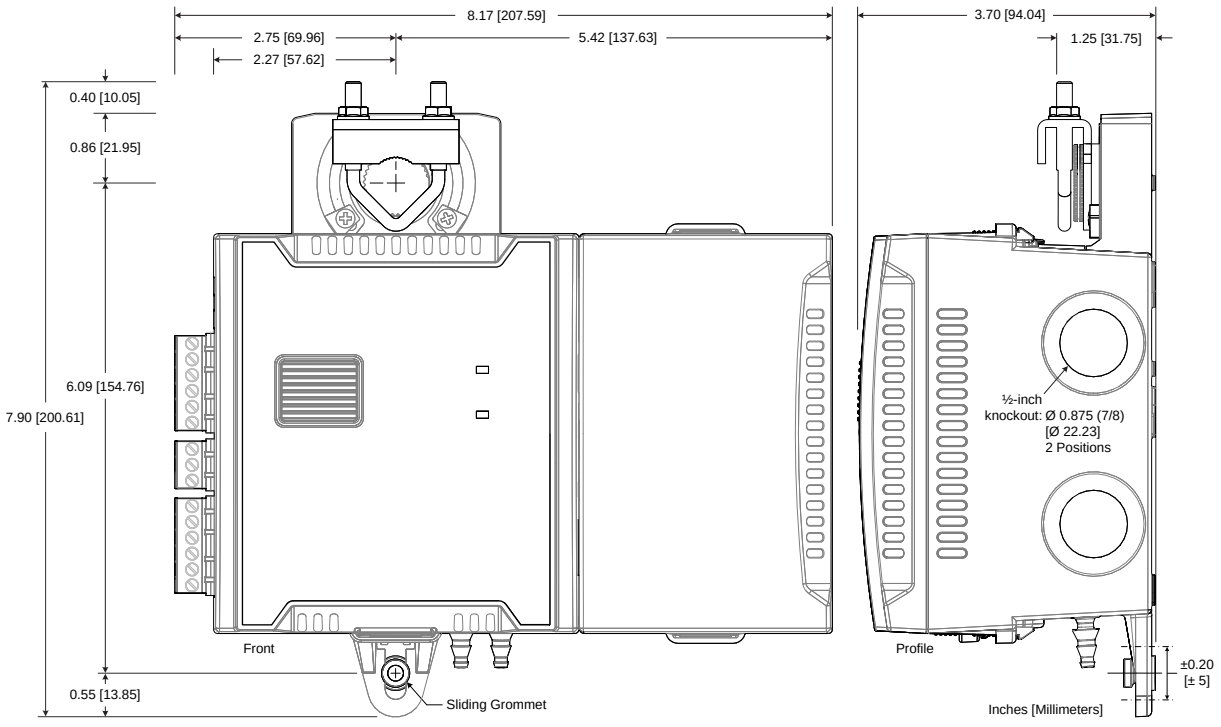

Figure 2: ECY-VAV-PoE Controller Dimensions

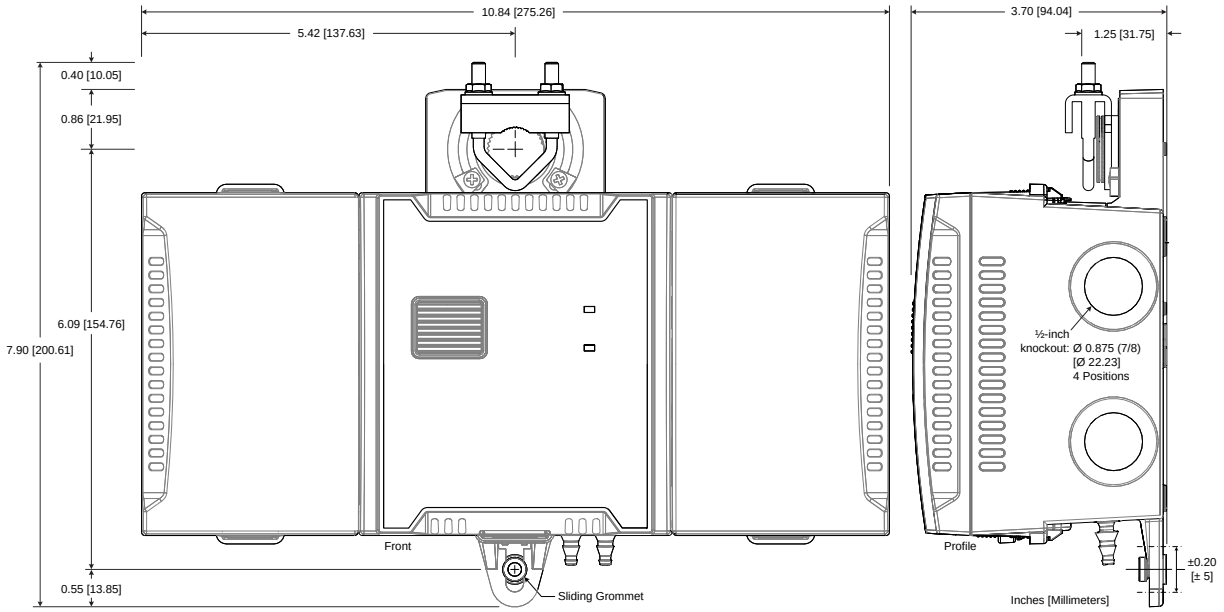

Figure 3: ECY-VAV Controller with Terminal Covers Dimensions