INTEGRATED VAV CONTROLLER

The Integrated VAV is a freely programmable controller designed for pressure-independent control of any single duct Variable Air Volume (VAV), Constant Air Volume (CAV) and Supply/ Exhaust terminal units. These controllers are ideally suited for critical environment applications such as Laboratory Airflow Tracking, Critical Patient Rooms, Operating Rooms, and other applications requiring precise control of airflows.

This controller is supported by Alerton's VisualLogic® programming tool and the Compass 2.2.3 and above version supervisor. The Integrated VAV controller has an integral damper actuator, field replaceable airflow sensor, up to seven flexible universal inputs/outputs (UIO), five solid state relay outputs, and a Microset bus. The controller supports BACnet/IPv4 and BACnet/IPv6.

The integrated Bluetooth® Low Energy (BLE) enables easy pairing with mobile apps such as Honeywell Connect Mobile app with balancing feature.

FEATURES AND BENEFITS

COMMUNICATION

- Supports BACnet® IP communication through CAT5/6 or T1L which enables faster download, thereby reducing commissioning time, and increased data bandwidth for increased data sharing.

- Built-in 2-port Ethernet switch supports up 10/100 Mpbs on CAT5/6.

- Supports fail-safe daisy chains (IP T1L) over distances of up to 3,281 feet (1,000 meters) at a standard speed of 10 Mbps, significantly higher than the standard CAT5/6 distances.

- Supports full duplex IPv4/IPv6 addressing, DHCP, SLAAC, and Link Local addressing modes.

- Supports Rapid Spanning Tree Protocol (RSTP) and Network Time Protocol (NTPv4).

- Features a non-isolated RS-485 interface for Modbus communication.

- Integrated BLE to connect to mobile apps for balancing.

CHARACTERISTICS

- Compact design for small enclosures and easy to install on round and square ducts.

- Color-coded, removable terminal blocks to simplify wiring and replacement.

- Real-time clock with super capacitor circuit providing up to 24 hours of date/time retention.

- 20 VDC at 75 mA auxiliary supply for field devices.

- 7 Universal Inputs/ Outputs (UIO) configurable as analog voltage/current output or as a analog/binary input.

- 5 x 24 VAC solid state relay outputs with 1.5 A continuous and 3.5 A in-rush for 100 milliseconds per SSR output.

- All UI can be used for pulse input. Maximum frequency 100 Hz, Minimum duty cycle (50 % / 50 %) 5 ms ON / 5 ms OFF.

- Integrated 44 in-lbs (5 Nm) modulating actuator with 90 seconds runtime at 60 Hz (108 seconds at 50 Hz) with analog position feedback.

- Field replaceable differential pressure sensor (± 500 Pa; accuracy +/- 3% of full range).

- The airflow sensor is factory calibrated at multiple velocity points. Minimum, maximum and reheat airflows can be entered using a Microset wall unit or compatible operator workstation software.
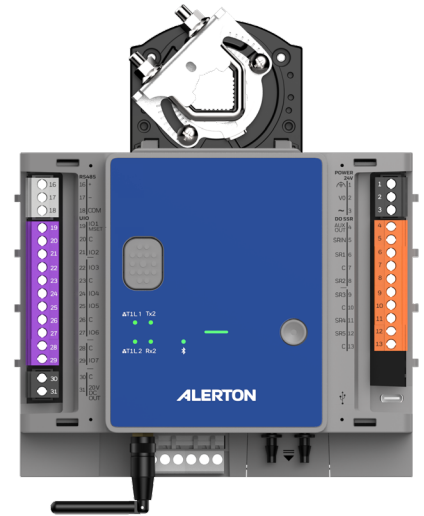
SUPPORTS

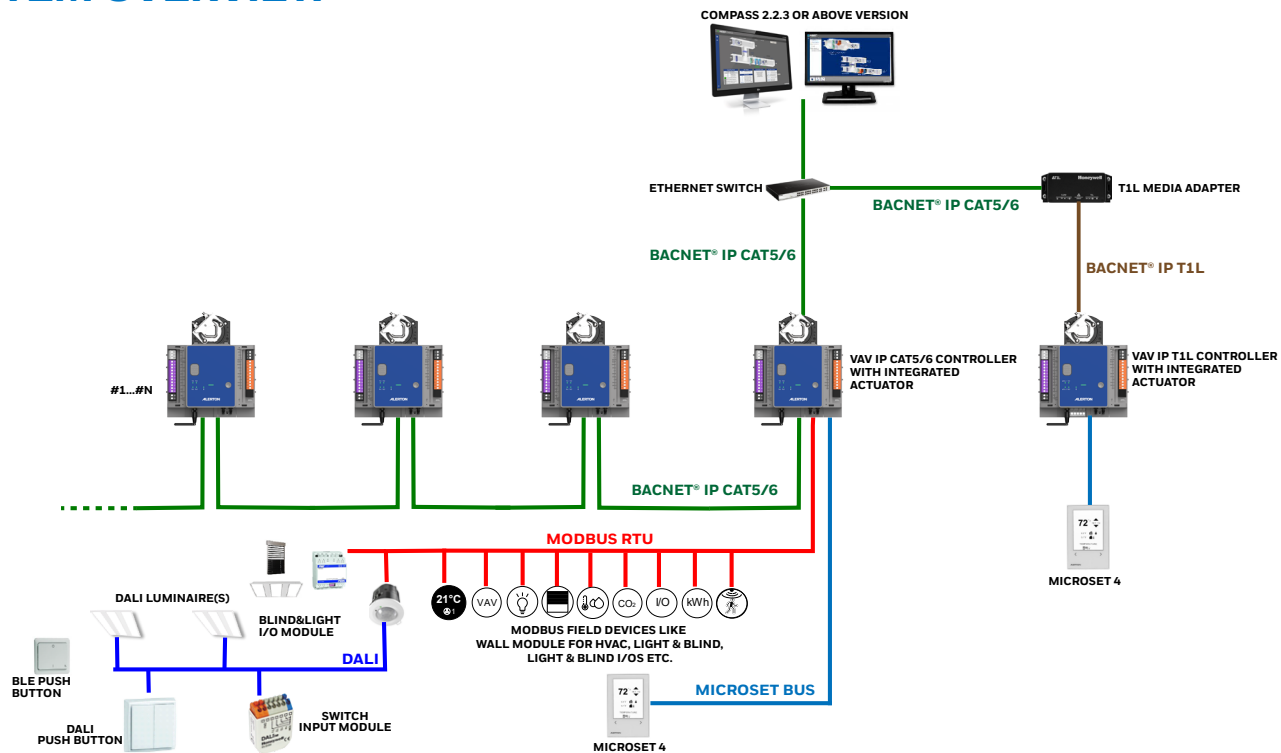- 50 trendlogs at 60 seconds interval minimum. (This includes 10 COV trendlogs).

- 3 Schedules and 1 Zone (Optimum Start for internal point only).

- 25 Alarms (Event Enrollment Objects).

- 5 Notification Class Objects.

- 1 Calendar object.

- Supports Honeywell Connect Mobile for balancing, BMS Startup - Device Pairing mobile app for device pairing, device numbering and easy deployment using

  BACnet® "Who Am I" and "You are" messages.

FREELY PROGRAMMABLE

- Supports Alerton's BD9 DDC file format using Alerton's VisualLogic®.

- Extensive library of VAV applications is available, including ASHRAE Guideline 36.

- All control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic®.

- Using BD9 DDC the VAV IP controller can execute more complex calculations to meet the needs of increasingly demanding sequences of operations for building systems.

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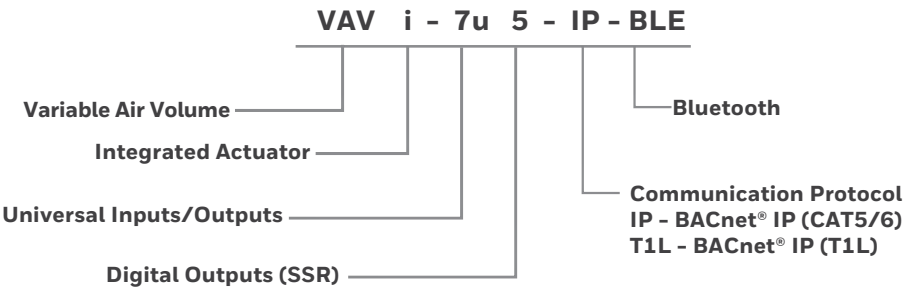
SYSTEM OVERVIEW

ORDERING NUMBERS

CONTROLLER MODEL	POWER SUPPLY	UIO	SOLID STATE RELAY	INTEGRATED ACTUATOR	COMMUNICATION	BLUETOOTH
VAVi-7u5-IP	24 VAC	7	5	Yes	BACnet® IP (CAT5/6)	No
VAVi-0-IP	24 VAC	0	0	Yes	BACnet® IP (CAT5/6)	No
VAVi-7u5-IP-BLE	24 VAC	7	5	Yes	BACnet® IP (CAT5/6)	Yes
VAVi-7u5-T1L	24 VAC	7	5	Yes	BACnet® IP (T1L)	No
VAVi-0-T1L	24 VAC	0	0	Yes	BACnet® IP (T1L)	No
VAVi-7u5-T1L-BLE	24 VAC	7	5	Yes	BACnet® IP (T1L)	Yes

Note: CAT5 cables are used primarily because they offer a connection speed of 100 Mbps while CAT6 cables support up to 10 Gbps.
The network infrastructure is designed for 100 Mbps, therefore CAT6's higher capacity would not be fully utilized in the current setup.

REPLACEMENT PARTS

PART NUMBER	DESCRIPTION
SDPPF500PA	Replacement air flow sensor for use if the original sensor is damaged, or becomes inoperable. (Sold in pack of 2)
10BASE-T1L-ADAPT-0	BACnet® IP (T1L) single pair media adapter that allows converting 10BASE-T traffic to 10BASE-T1L without including power supply.

CONTROLLER PART NUMBERS DESCRIPTION

VAV   i – 7u 5 – IP – BLE

Variable Air Volume

Integrated Actuator

Universal Inputs/Outputs

Digital Outputs (SSR)

Bluetooth

Communication Protocol
IP – BACnet® IP (CAT5/6)
T1L – BACnet® IP (T1L)

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PRODUCT SPECIFICATIONS

HARDWARE

PARAMETER	SPECIFICATION
CPU	Crossover processor NXP I.MRT, Cortex M7
MEMORY CAPACITY	512 MB QSPI Flash, 128 MB SDRAM
IP CAT5/6[1]	2 x RJ-45 ports, 10/100 Mbps with a protection that allows loop topology to continue the communication with other controllers even if one node fails, when used with an RSTP supporting device.
IP T1L[2]	2 x T1L ports with fail-safe, up to 10 Mbps with a protection that allows loop (when used with an RSTP supporting device) and daisy-chain topology to continue the communication with other controllers even if one node fails.
REAL TIME CLOCK	24 hours backup after power failure. After 24 hours, the time will reset to factory default time until the user performs time sync via BACnet® or Network Time Protocol (NTP).
SMALL LED	Transmission or Reception of communication Signal (green)
LARGE LED	Controller status (green, yellow and red).

NOTE: [1] applicable for IP CAT5/6 variant only.
[2] applicable for IP T1L variant only.

ELECTRICAL

PARAMETER	SPECIFICATION
VOLTAGE RANGE	20-30 VAC; Class 2 transformer
POWER CONSUMPTION	Nominal 9.3 VA (For VAVi-7u5-IP, VAVi-7u5-IP-BLE and VAVi-0-IP, actuator at nominal load and IP CAT5/6 communication active) Nominal 8 VA (For VAVi-7u5-T1L, VAVi-7u5-T1L-BLE) Nominal 6.5 VA (For VAVi-0-IP, VAVi-0-T1L)
FREQUENCY RANGE	50 to 60 Hz
AUXILIARY OUTPUT	20 VDC @ 75 mA
INTERNAL POWER SUPPLY	Half-wave rectified

OPERATIONAL ENVIRONMENT

PARAMETER	SPECIFICATION
STORAGE	-40 °F to 150 °F (-40 °C to 66 °C)
OPERATION	32 °F to 122 °F (0 °C to 50 °C)
HUMIDITY	5% to 95% RH., non condensing
PROTECTION	IP20, NEMA 1
POLLUTION LEVEL	2

AIR-FLOW SENSOR

PARAMETER	SPECIFICATION
RANGE	± 2 in. w.c. (± 500 Pa)
ZERO-POINT ACCURACY	0.0004 in.w.c. (0.1 Pa)
REPEATABILITY	0.5% of reading
CONNECTION	1/8-inch x 3/8-inch long barbfitting
RESOLUTION	16 bit input

INTEGRATED MODULATING ACTUATOR

PARAMETER	SPECIFICATION
TORQUE	44 in-lbs (5 Nm) with analog position feedback.
RUN TIME	108 seconds at 50 Hz; 90 seconds at 60 Hz
MOUNTING SHAFT	Round 8-16 mm (5/16 – 5/8"); Square 6-13 mm (15/64 – 33/64")
SHAFT LENGTH	≥ 1 5/8 in (41 mm)

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PRODUCT SPECIFICATIONS

SOLID STATE RELAY

SPECIFICATION
SSR does switch supply voltage, works with AC and DC, however in case of DC no support for synchronous motor.
• 1.5 A constant; 3.5 A inrush for 0.1 sec per SSR output
• Optional bridge provides shared power to all SSRs from 24 VAC powering controller.
Note: SSR will not close the contact unless voltage is present, they cannot be used as dry contact.

UIO (CONFIGURABLE AS ANALOG OUTPUT OR UNIVERSAL INPUT)

PARAMETER	SPECIFICATION
AO	16-bit universal analog outputs support Voltage Mode: 0-10 VDC @ 10 mA maximum (1k ohm minimum); Current Mode: 4-20 mA @ 550 ohms Maximum; or Binary Mode: 11 VDC @ 20 mA maximum relay coil current (for controlling low-coil current 11 VDC relays and solid-state relays).
UI	16-bit universal inputs accept 10 k thermistor (type II and type III), 3k thermistor, dry contact, 1k platinum RTD, 0-20 mA, 0-10 V, or dry-contact pulse. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5ms ON / 5ms OFF. NOTE: Some 4-20 mA input sensors may need an external resistor to function properly. Please refer to the sensor's documentation.
Common terminal shared by 2 UIO, protected against 24 VAC mis-wiring and short circuit.	

Important Note: This device is UL listed and limited to 100 VA maximum. Binary output loads are restricted by this maximum VA rating. If all 5 SSR binary outputs are connected and fully loaded (@24 VA each) the total VA of the device will exceed the UL listed and limited maximum rating. DO NOT EXCEED 100 VA MAXIMUM RATING!

COMMUNICATION

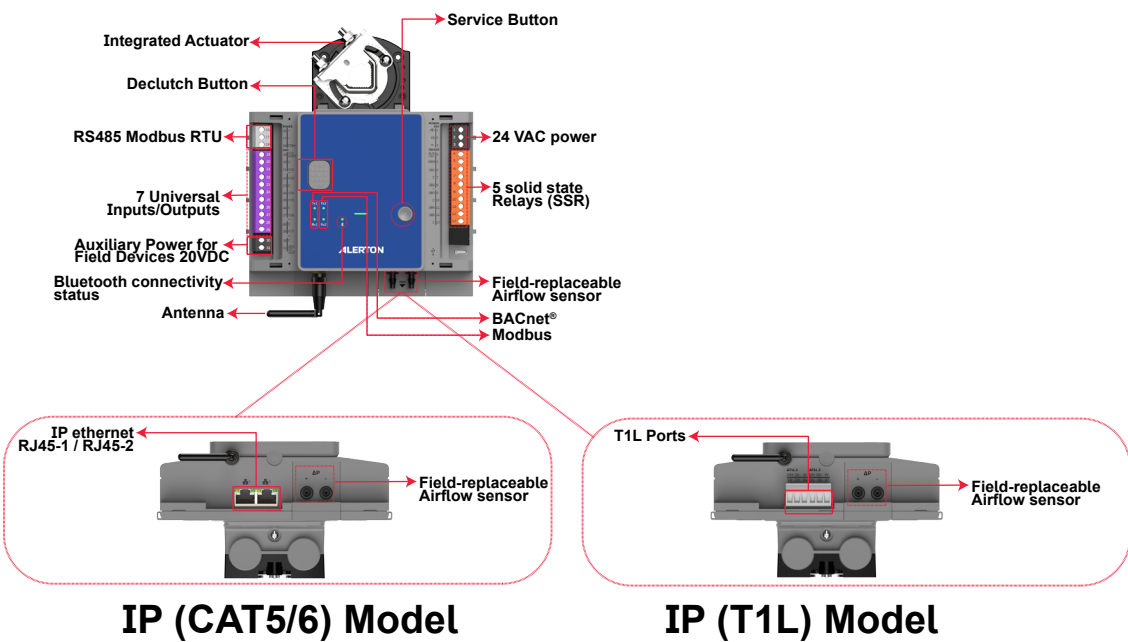| PARAMETER	SPECIFICATION
PROTOCOL SUPPORTED	BACnet/Ethernet, Modbus RTU
ETHERNET CONNECTION SPEED	IP CAT5/6: 10/100 Mbps IP T1L: 10 Mbps
INTERNET PROTOCOL VERSION	BACnet/IPv4 and BACnet/IPv6
IP ADDRESSING MODES	Supports Static, DHCP, SLAAC
NETWORKING PROTOCOL	Rapid Spanning Tree Protocol (RSTP) and Network Time Protocol (NTP4)
MICROSET BUS	2 wire, polarity sensitive bus for Microtouch, Microset-BT, Microset II and Microset 4 wall modules

IP T1L COMMUNICATION

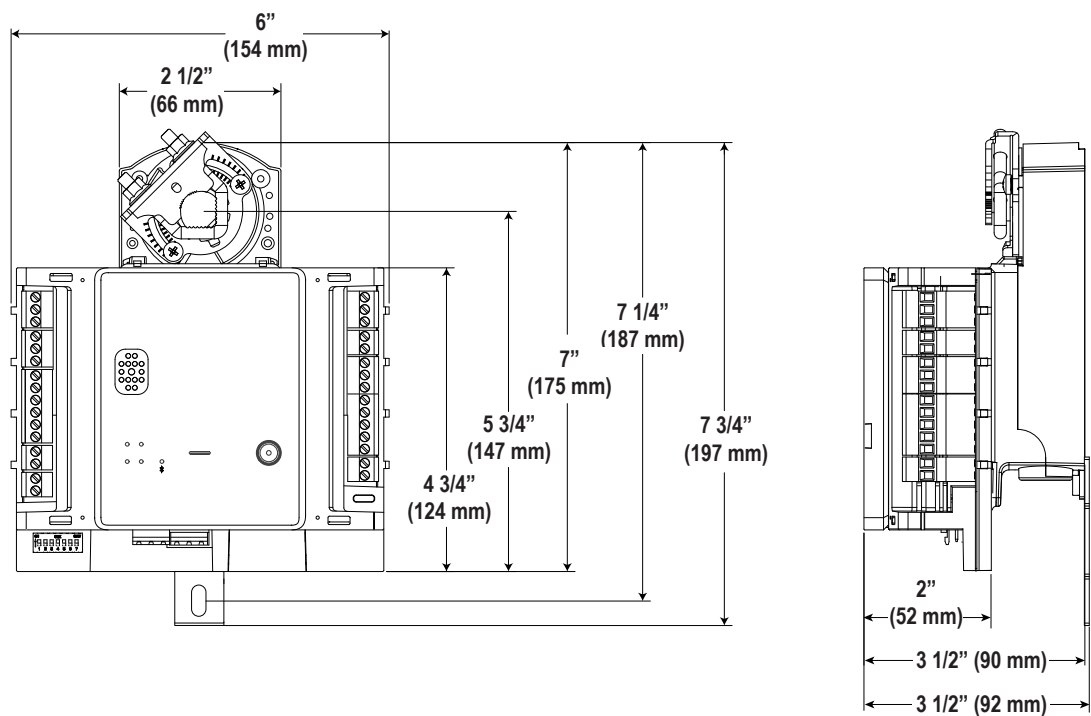| PARAMETER	SPECIFICATION
10BASE-T1L STANDARD	802.3cg-2019
CONNECTION	Screw terminal, auto MDI-X
CABLE TYPE	18-23 AWG, Twisted Pair, Shielded Al-Foil and Cubraid tinned
DISTANCE	Maximum distance between controllers up to 3281 ft. (1000 m) depending on cables characteristics and network resiliency approach. For more details about cable type and characteristics refer to the T1L Network Specification Guide.
TRANSMISSION RATE	10 Mbps

STANDARDS AND COMPLIANCE

SPECIFICATION
IP CAT5/6 and IP T1L VAV models as BACnet® Advanced Application Controller (B-AAC); (BTL certification is pending)
FCC Part 15, Class A
IC – ICES-003 Issue 6
UL916, Energy Management Equipment
RoHS
EN 55022. Class A
EN 61000-3-2, 61000
CE

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HARDWARE OVERVIEW

Integrated Actuator
Service Button
Declutch Button
RS485 Modbus RTU
24 VAC power
7 Universal Inputs/Outputs
5 solid state Relays (SSR)
Auxiliary Power for Field Devices 20VDC
Field-replaceable Airflow sensor
Bluetooth connectivity status
BACnet®
Modbus
Antenna

IP ethernet RJ45-1 / RJ45-2
Field-replaceable Airflow sensor

T1L Ports
Field-replaceable Airflow sensor

IP (CAT5/6) Model

IP (T1L) Model

DIMENSIONS

6" (154 mm)
2 1/2" (66 mm)
7 1/4" (187 mm)
7" (175 mm)
5 3/4" (147 mm)
4 3/4" (124 mm)
7 3/4" (197 mm)

2" (52 mm)
3 1/2" (90 mm)
3 1/2" (92 mm)

PARAMETER	SPECIFICATION
DIMENSION (LXWXH)	7 X 6 X 3 1/2 inches (175 X 154 X 92 mm)
WEIGHT	1.5 kg
MOUNTING	Fixation with bracket and shaft

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