

# VAV IP CONTROLLER

The VAV IP 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 2.2.0 and above version supervisor. The VAV IP 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) capability enables easy pairing with mobile apps such as BMS Startup app.



## FEATURES AND BENEFITS

### COMMUNICATION

- Supports BACnet® IP communication which enables faster download, thereby reducing commissioning time, and increased data bandwidth for increased data sharing.
- Built-in 2-port Ethernet switch supports 10/100 Mbps.
- 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 (future firmware upgrade required).

### 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.

- Up to seven Universal Inputs/Outputs (UIO) configurable as analog voltage/current output or as an analog/binary input.
- Up to five 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 ( $\pm 500$  Pa; accuracy  $\pm 3\%$  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).

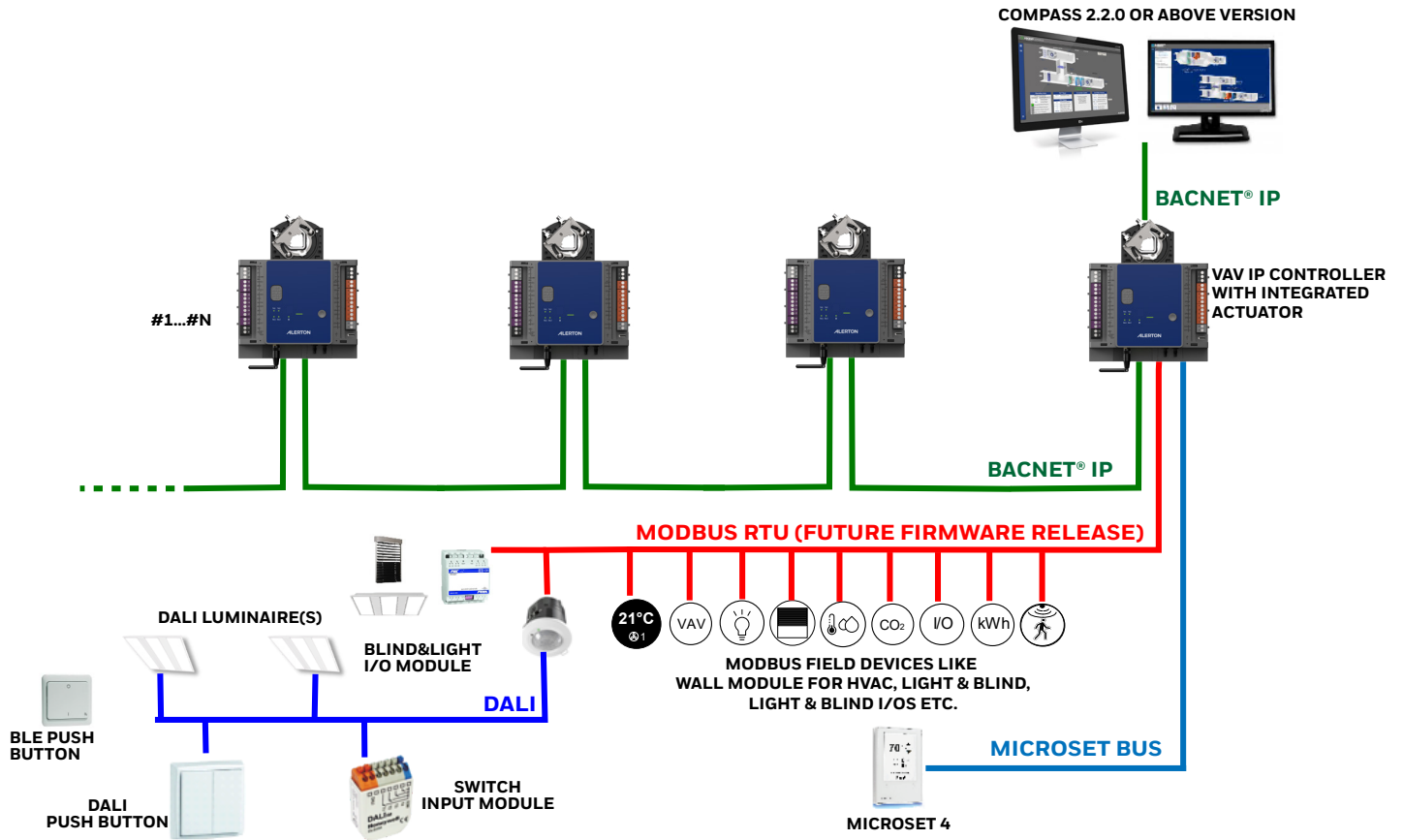
- 3 Schedules and 1 Zone (Optimum Start for internal point only).
- 25 Alarms (Event Enrollment Objects).
- 5 Notification Class Objects.
- Supports BMS Startup - Device Pairing mobile app for device pairing, device numbering and easy deployment using BACnet® "Who Am I" and "You are" messages.

### 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



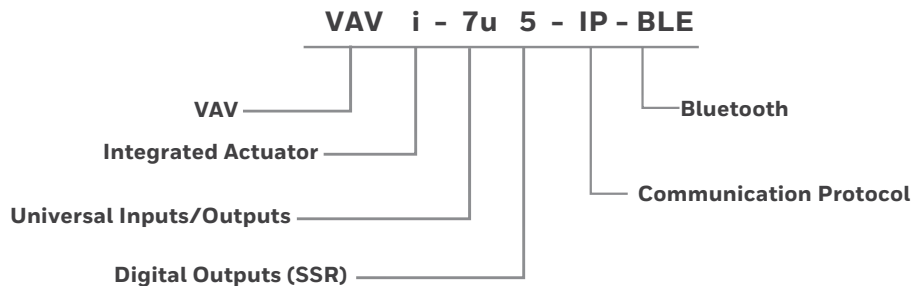
## ORDERING NUMBERS

CONTROLLER MODEL	POWER SUPPLY	UIO	SOLID STATE RELAY	INTEGRATED ACTUATOR	COMMUNICATION	BLUETOOTH
VAVi-7u5-IP	24 VAC	7	5	Yes	IP	No
VAVi-0-IP	24 VAC	0	0	Yes	IP	No
VAVi-7u5-IP-BLE	24 VAC	7	5	Yes	IP	Yes

## REPLACEMENT PARTS

PART NUMBER	TYPE	DESCRIPTION
SDPPF500PA	Air flow sensor	Replacement air flow sensor for use if the original sensor is damaged, or becomes inoperable. (Sold in pack of 2)

## CONTROLLER PART NUMBERS DESCRIPTION



# PRODUCT SPECIFICATIONS

## HARDWARE

PARAMETER	SPECIFICATION
CPU	Crossover processor NXP I.MRT, Cortex M7
MEMORY CAPACITY	512 MB QSPI Flash, 128 MB SDRAM
BACnet® IP	2 X RJ-45 Ethernet ports 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.
REAL TIME CLOCK	24-Hours backup after power failure. The controller includes a supercapacitor to power the built-in real time clock for 24-Hours. In case of power failure, the super capacitor retains the time set in controller for 24-Hours. After 24-Hours, the time will reset to default factory time until user perform BACnet Time Sync.
SMALL LEDS	Transmission or Reception of communication Signal (green)
LARGE LEDS	Controller status (green, yellow and red).

## COMMUNICATION

PARAMETER	SPECIFICATION
PROTOCOL SUPPORTED	BACnet/IPv4, BACnet/IPv6, BACnet/Ethernet
ETHERNET CONNECTION SPEED	10/100 Mbps
INTERNET PROTOCOL VERSION	IPv4 and 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

## SOLID STATE RELAY

SPECIFICATION
SSR does switch supply voltage, works with AC and DC, however in case of DC no support for synchronous motor.
<ul style="list-style-type: none"> <li>1.5 A constant; 3.5 A inrush for 0.1 sec per SSR output</li> <li>Optional bridge provides shared power to all SSRs from 24 VAC powering controller.</li> </ul>
<b>Note:</b> 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 III), 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!

## ELECTRICAL

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

## 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)

## 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

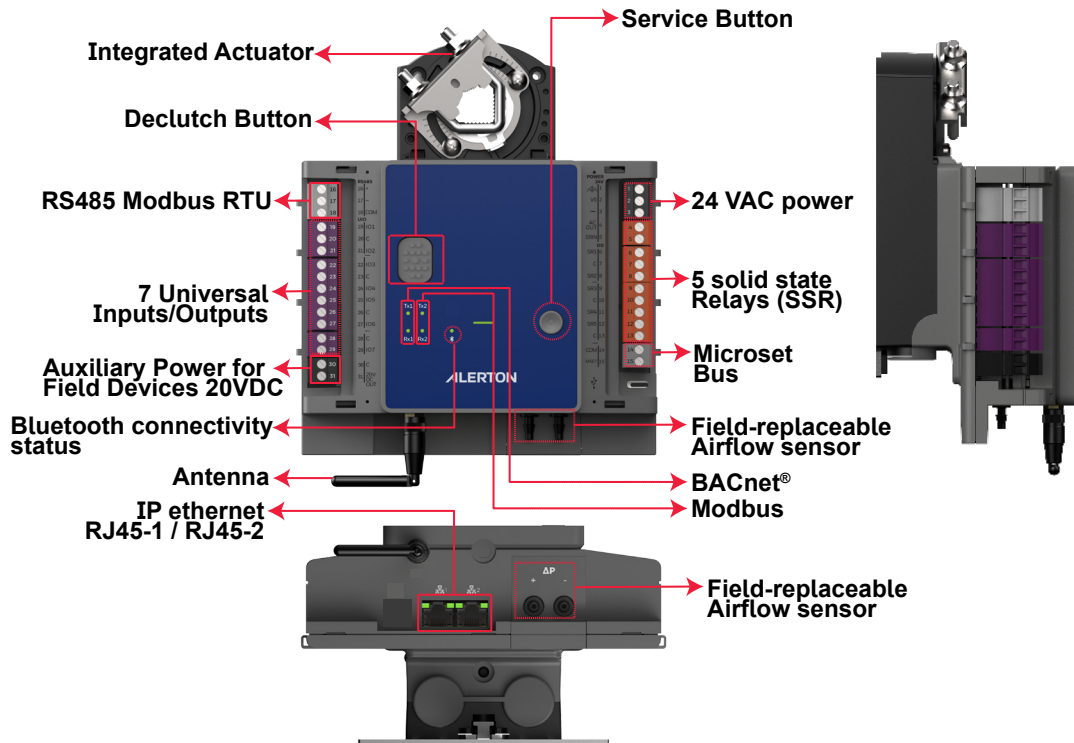
## AIR-FLOW SENSOR

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

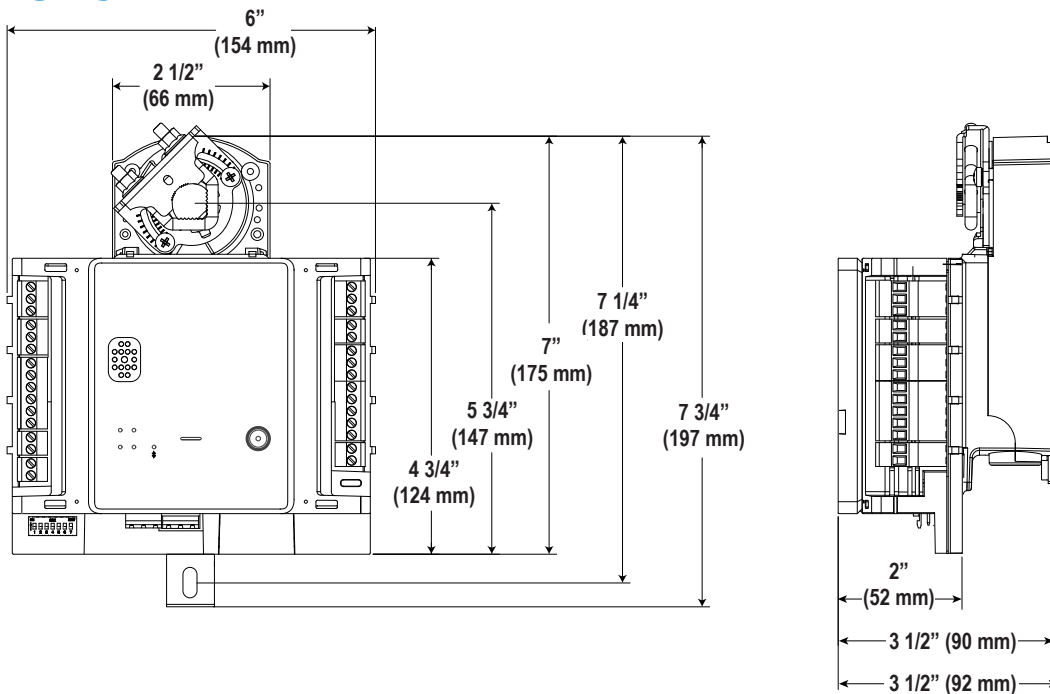
## STANDARDS AND COMPLIANCE

SPECIFICATION
BACnet® BTL®-Listed; IP VAV model as BACnet® Advanced Application Controller (B-AAC); (BTL certification is in progress).
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

# INTERFACE



# DIMENSIONS



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

## ALERTON

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