

## MicroNet BACnet™ VAV Controllers

The I/A Series MicroNet BACnet VAV (Variable Air Volume) Controllers are interoperable controllers with native BACnet, IP, and MS/TP communications support. All models incorporate: an integral actuator with manual override; an integral, patented, pressure transducer; three universal inputs; Sensor Link (S-Link) support; LED status indication; and over-the-shaft damper mounting. See the model chart (Figure-1) for optional features.

### Applications

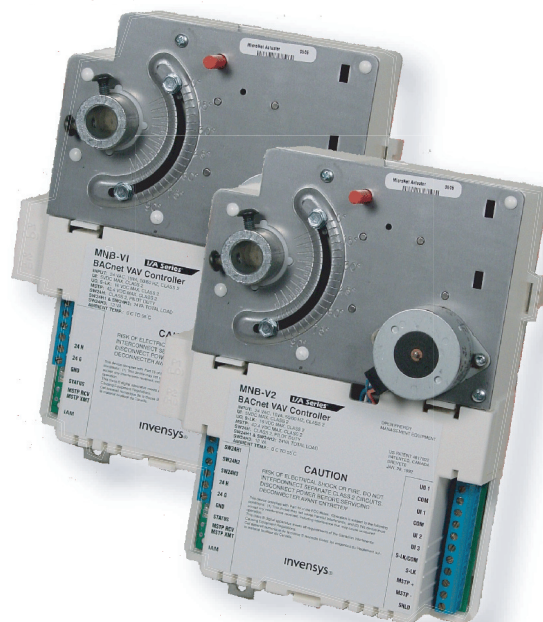
When programmed using WorkPlace Tech Tool, the controllers provide a wide range of control strategies for pressure-dependent and pressure-independent terminal boxes with or without reheat capabilities.

### Connectivity

The MicroNet BACnet VAV controllers can function either in a standalone mode or as part of a BACnet building automation system (BAS) network.

### Features—

- The MicroNet BACnet VAV controllers' sequence of operation and BACnet image are fully programmable using WorkPlace Tech Tool. The controllers can be applied to all common VAV configuration and reheat control strategies.
- Capability to function in standalone mode or as part of a BACnet building automation network.
- Extensive BACnet object and services support provides robust BAS integration and optimum use of network bandwidth.
- Air balancing performed using VAV Flow Balance software through RS-485 connection.
- Integral MS/TP jack for direct connection of PC with WorkPlace Tech Tool and Flow Balance tool.
- Integrated packaging with actuator, pressure transducer, and controller.



- Integral actuator features manual override and travel limit stops for easy set up and adjustment.
- Plenum-rated enclosure.
- DIP switch addressable.
- Isolated RS-485 transceiver for MS/TP communications.
- MS/TP baud rate selection from 9.6 up to 76.8 kbaud.
- LED indication of MS/TP communication activity and controller status.
- Firmware upgradeable over the network.
- Damper position feedback to the BACnet BAS via integral hall effect sensor.
- Stable flow control down to 0.004 in. W.C. differential pressure.

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**Table-1 Model Chart.**

Model	Description	Inputs and Outputs		
		UI	UO	DO (Triac)
MNB-V1	Cooling Only	3	—	—
MNB-V2	Deluxe	3	1	3

## Hardware Specifications

**Dimensions** 7-3/4 in. H x 6-1/4 in. W x 2-1/2 in. D (197 mm x 159 mm x 63 mm).

**Enclosure** Conforms to NEMA-1. Meets UL 94-5V flammability ratings for plenum application use.

**Mounting** Shaft mount.

**Power Supply Input** 20.4 to 30 Vac, 50/60 Hz

**Power Consumption** 15 VA at 24 Vac plus DO loads.

### Agency Listings

**UL-916** File #E9429 Category PAZX.

**Canadian** UL Listed to Canadian Safety Standards (CAN/CSA 22.2).

**FCC** Part 15 Class A.

**Australian** Meets requirements to bear the C-Tick Mark.

**European Community – EMC Directive 89/336/EEC**  
EN61326

### Ambient Limits

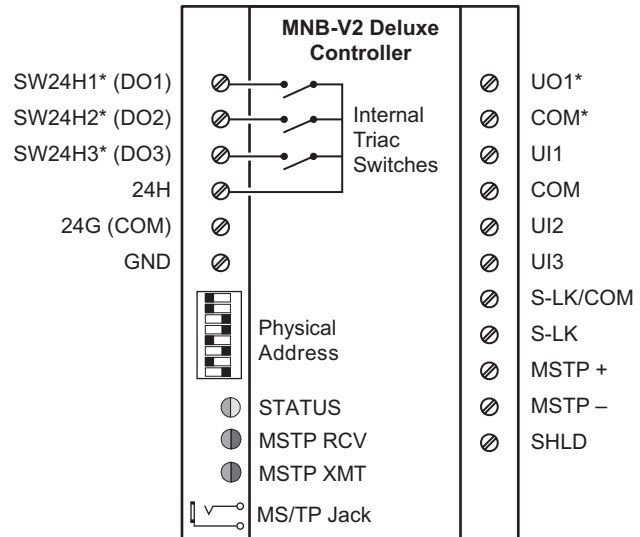
#### Temperatures.

**Operating.** 32 to 131 °F (0 to 55 °C).

**Shipping and Storage.** -40 to 160 °F (-40 to 71 °C).

**Humidity.** 5 to 95% non-condensing.

**Wiring Terminals (Figure-1)** Fixed Screw terminals; single AWG #14 (2.08 mm<sup>2</sup>) wire or up to two AWG #18 (0.823 mm<sup>2</sup>) or smaller wires.



\* Asterisks indicate terminals that apply to the MNB-V2 controller but not to the MNB-V1.

Figure-1 VAV Controller Terminals.

### Velocity Pressure Input

**Control Range** 0.004 to 1.5 in. of W.C.

**Over Pressure Withstand** ±20 in. of W.C.

**Accuracy** ±5% at 1.00 in. of W.C. with laminar flow at 77 °F (25 °C) and suitable flow station.

**Sensor Type** Self-calibrating flow sensor (differential pressure).

**Tubing Connections** Barb fittings for 0.170 in. I.D. FRPE polyethylene tubing or 1/4" O.D./0.125" I.D. Tygon<sup>®</sup> tubing (high and low pressure taps).

**Tubing Length** 5 ft. (1.52 m) maximum, each tube.

### Inputs from MN-Sx I/A Series MicroNet Sensor

**Space Temperature** 32 to 122 °F (0 to 50 °C).

**Space Humidity** 5 to 95% RH, non-condensing.

**Local Setpoint** Adjustable within limits set by application programming tool.

**Override Pushbutton** For standalone occupancy control.

**Fan Operation and Speed Mode** On/off, speed (low/medium/high), or auto.

**System Mode** Heat, cool, off, or auto.

**Emergency Heat** Enable or disable.

**Universal Inputs (3)** Universal Input characteristics are software-configured to respond to one of the following input types:

**10 k $\Omega$  Thermistor with 11 k $\Omega$  Shunt Resistor**

Sensor operating range -40 to 250 °F (-40 to 121 °C), Invensys model TSMN-57011-850, TS-5700-850 series, or equivalent.

**1 k $\Omega$  Balco** -40 to 250 °F (-40 to 121 °C), Invensys model TSMN-81011, TS-8000 series, or equivalent.

**1 k $\Omega$  Platinum** -40 to 240 °F (-40 to 116 °C), Invensys model TSMN-58011, TS-5800 series, or equivalent.

**1 k $\Omega$  Resistive** 0 to 1500  $\Omega$ .

**10 k $\Omega$  Resistive** 0 to 10.5 k $\Omega$ .

**Analog Voltage** Range 0 to 5 Vdc.

**Analog Current** Range 0 to 20 mA, requires external 250  $\Omega$  shunt resistor (AD-8969-202).

**Digital** Dry switched contact; detection of closed switch requires less than 300  $\Omega$  resistance; detection of open switch requires more than 1.5 k $\Omega$ .

**Standard Pulse Input**

**Minimum Rate** 1 pulse per 4 minutes.

**Maximum Rate** 1 pulse per second.

**Actuator Outputs**

**Torque Rating** 53 lb-in. (6 N-m).

**Stroke** Fully adjustable from 0° to 90°.

**Timing** Approximately 3 minutes at 60 Hz (3.6 minutes at 50 Hz) for 90° rotation at 24 Vac.

**Position Indication** Provides a visual indication of position.

**Manual Override** Pushbutton to allow manual positioning of the damper.

**Damper Linkage** 1/2 in. (12.75 mm) or 3/8 in. (9.5 mm) diameter round shaft extending 7/8 in. (22.23 mm) minimum from terminal box. 3/8 in. (9.5 mm) diameter shaft requires AM-135 adapter kit.

**Digital Outputs – Triac**

**DO1 plus DO2 Rating** 24 VA total at 24 Vac, 50/60 Hz, high side switching.

**DO3 Rating** 12 VA at 24 Vac, 50/60 Hz, high side switching.

**Universal Output**

**0 to 20 mA** Output load from 80 to 550  $\Omega$ .

**0 to 10 V** With external 500  $\Omega$ , 1/2 W, 1% resistor.

**Capable of Driving Functional Devices RIBUI1C Relay** UO configured for 0 to 20 mAdc, no external resistor.

## Communications

**BACnet Networks** The MicroNet BACnet VAV controllers incorporate an isolated RS-485 transceiver for BACnet MS/TP communications at 9.6 up to 76.8 kbaud, using standard MS/TP wiring methods. Up to 128 MicroNet BACnet controllers can be connected to an MS/TP sub-net without repeaters.

**S-Link** The Sensor Link (S-Link) communications wiring provides power and a communication interface for one MN-Sx I/A Series MicroNet sensor. The various MN-Sx sensors can provide room temperature, room humidity, setpoint adjustment, and occupancy override. This connection uses two-wire, unshielded cable and is not polarity sensitive. Maximum S-Link bus length is 200 ft (61 m).

## I/A Series VAV Flow Balance Software

Provides flow balancing for networked and standalone VAV controllers. Features include:

- Local network control.
- Damper and fan adjustment.
- Setpoint monitoring and adjustment.
- Flow validation and calibration (two-point calibration).
- Sequence, calibration, and control setpoint logs.

## BACnet Compliance

**Conformance Class** BACnet Application Specific Device (B-ASD).

## Options

**MNA-FLO-1:** MicroNet™ enclosure, used if wiring to flexible conduit is required.

**MNB-BAL:** Flow Balance software.

**S-Link Sensors:** Temperature and humidity wall sensors with digital communication

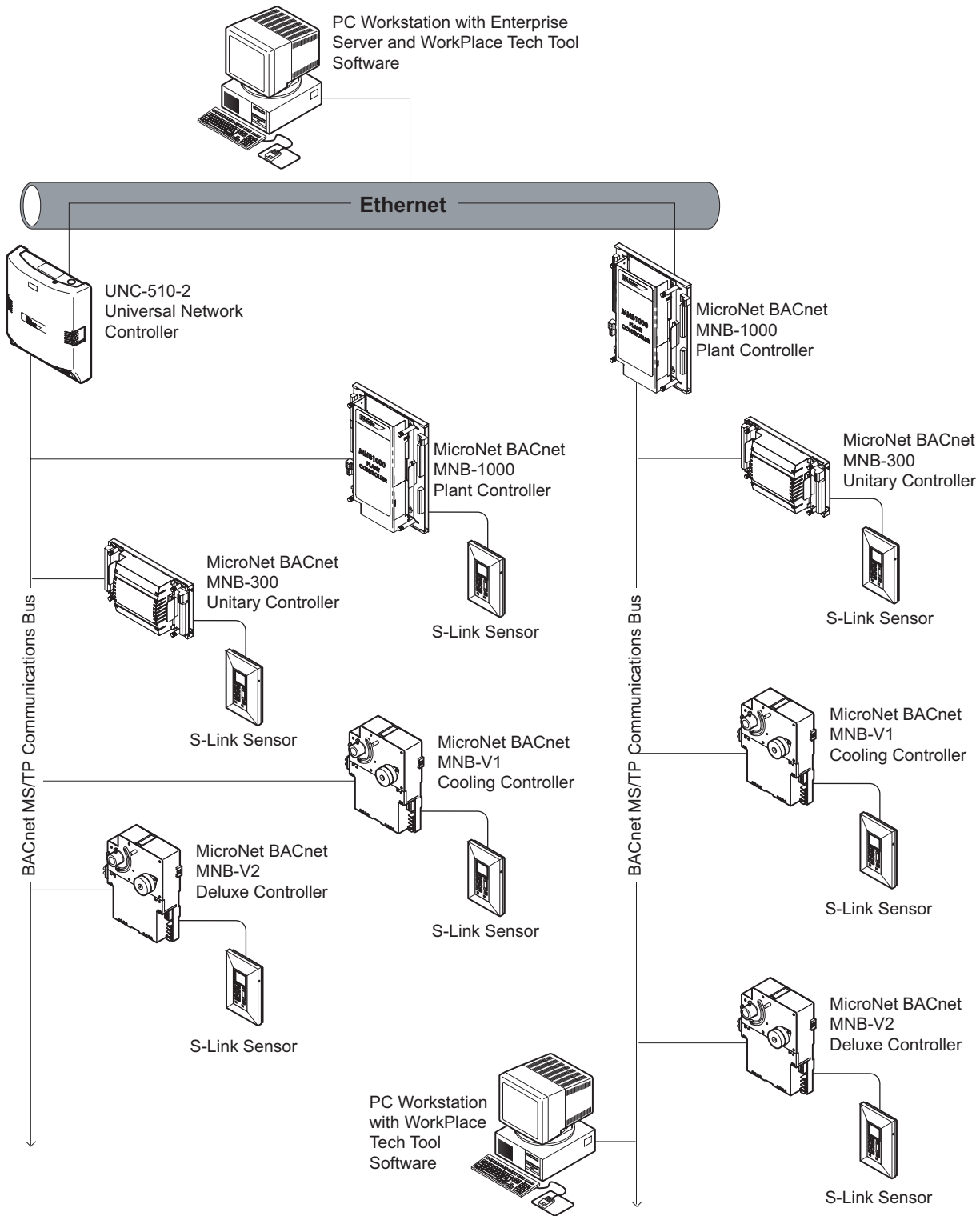


Figure-2 I/A Series BACnet Topology.

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