



## AAON Mini Controller Installation Guide

### Quick Start

The AAON Mini Controller has been designed for single zone constant volume or single zone variable air volume temperature and humidity control. It is a native BACnet Advanced Application Controller (B-AAC) for use in a BACnet system.

### ! WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Startup and service must be performed by a Factory Trained Service Technician.

**Note:** This document gives basic mounting, wiring, and setup information only. See AAON Mini Controller Thermostat User's Manual for detailed operation, configuration and setup information (available at [www.aon.com](http://www.aon.com)).

To use this controller:

1. Mount and wire the unit
2. Configure and setup the unit
3. If necessary, troubleshoot any issues
4. Operate the unit

### Mounting

For optimum performance controller should be mounted on an interior wall 4-5 feet above the floor away from heat sources, sunlight, windows, air vents, and air circulation obstructions.

1. Complete rough-in wiring at each location prior to controller installation.

2. Hex screws at the bottom and top of the thermostat backplate must be turned clockwise until clear of the controller cover to allow removal of the cover.
3. Route wiring through the backplate.
4. With the embossed UP toward the ceiling, fasten the backplate directly to a vertical 2x4 inch wall handy box. A 4x4 inch wall backplate is also provided for horizontal 2x4 handy box and 4x4 handy box applications.

### ! CAUTION

To prevent mounting screw heads from touching the circuit board in the controller, use only the mounting screws provided with the controller. Using screws other than the type supplied may damage the controller.

5. Make the appropriate connections to the terminal block.
6. Place controller cover over the backplate while being careful not to pinch or dislodge any wiring. Turn the hex screws counterclockwise until they engage the cover and hold it in place.

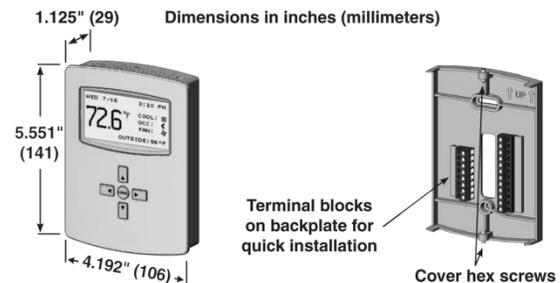


Figure 1 - Dimensions and Connections

### BACnet MS/TP EIA-485 Wiring

Connect the -A terminals in parallel with all other -A terminals on the network and the +B terminals in parallel with all other +B terminals. Connect the shields of the cable together at each device using a wire nut. Connect the cable shield to a good earth ground at one end only.

Controllers on the physical ends of the EIA-485 wiring segment must have end-of-line termination installed for proper network operation. If a thermostat is at the physical end of the MS/TP network line, set both the EOL termination switches to the *On* position on the back of the circuit board. If not on the end, ensure that both switches are *Off*.

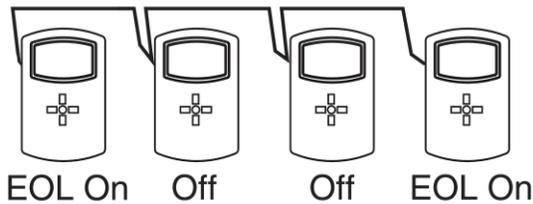


Figure 2 - MS/TP Network End-of-Line Terminology

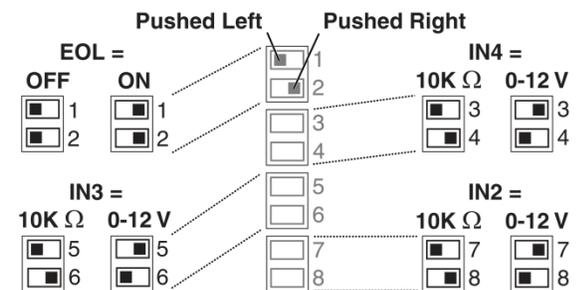


Figure 3 - EOL and Pull-Up Switch Resistor Positions

### Input Connections

Passive input devices require pull-up resistors in the circuit. For passive input devices, such as 10k Type 3 thermistors, on the IN2 through IN4, set the pull-up switches on the back of the circuit board to the *10K* position. For active voltage devices, set the switches to the *0-12 V* position.

The input switch pairs (3-4, 5-6, 7-8) must not have both switches set to the left or both set to the right. For example, if switch 3 is set to the left, switch 4 must be set to the right. The input pull-up resistor switch pairs must be fully latched in either the *10K* or *0-12 V* positions - even if a switch pair has no input connected.

IN3 and IN4, the outside and supply air temperature sensor inputs, should not be changed and must always be set to the *10K* position.

For IN2, with factory provided sensors, inputs should be set up as:

- Suction pressure sensor - *0-12 V*
- Outside air humidity sensor - *0-12 V*
- CO<sub>2</sub> sensor - *0-12 V*
- Remote averaging space temperature - *10K*
- Fan status - *0-12 V*

The controller does not support 1k ohm RTDs.

		Backplate Wiring Cutout	HPU   Std		
			OAD		Analog Outputs
			GND		
			Y1 (Analog)		
MS/TP	+B		RH	Relay Outputs	
	-A		SC		
Inputs	OAT		E2   W3   Y1 (Relay)		
	SAT		E   W2		
	GND		O/B   W1	Relay Outputs	
24 VAC	L		SC		
	- C	Y2			
	~ R	G			

Figure 4 - Backplate Terminal Locations

### BACnet MS/TP EIA-485 Network

- +B = BACnet network terminal
- A = BACnet network terminal

### Inputs

Space Temp (Internal) = IN1, Space Temperature

L = IN2, Configurable Input:

- Suction Pressure - 0-10 VDC
- Outside Air Humidity - 0-10 VDC
- CO2 - 0-10 VDC
- Remote Space Temperature - 10k Type 3 Thermistor
- Fan Status - 0-10 VDC

SAT = IN3, Supply Air Temperature - 10k Type 3 Thermistor

OAT = IN4, Outside Air Temperature - 10k Type 3 Thermistor

Space RH (Internal) = IN5, Space Relative Humidity

GND = Ground

### 24 VAC

- C = COM, E, Common

~ R = 24 VAC Phase

### Analog Outputs

OAD = OUT9, EC1, Economizer Output - 0-10, 10-0, 2-10 or 10-2 VDC (0-100%)

GND = Ground

G2 = OUT8, S1, Variable Speed Supply Fan Output - 0-10 VDC (0-100%)

Y1 (Analog) = OUT7, Variable Capacity Compressor Output - 1-5 VDC (10-100%)

### Relay Outputs

RH = RLY6, Dehumidification

SC = Common (24 VAC)

E2 | W3 | Y1 (Relay) = RLY5, Emer. Heat 2/Heat 3/Compressor 1

E | W2 = RLY4, Emer. Heat 1/Heat 2

O/B | W1 = RLY3, Reversing Valve/Heat 1

SC = Common (24 VAC)

Y2 = RLY2, Compressor 2

G = RLY1, Supply Fan

### **Output Connections**

Connect the device under control between the desired output terminal and the related SC (Switched Common for relay outputs) or

GND (Ground for analog outputs). For a bank of three relays, there is one SC connection.

Do not attach a device that draws current exceeding the controller's capacity. Maximum output current for individual Analog outputs is 20 mA @ 12 VDC. Maximum output current for individual relays is 1 A @ 24 VAC/VDC or a total of 1.5 A per bank of 3 relays (relays 1-3, 4-6).

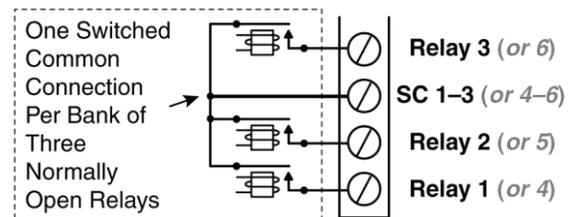
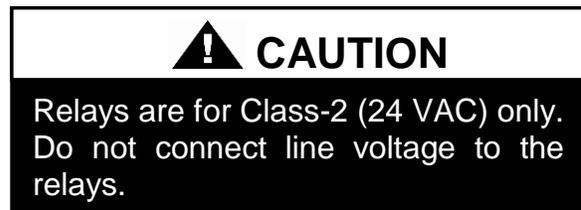


Figure 5 - Switched Common and Relays

Controller relays 1-6 are NO, SPST, Form A.



### **Power Connection**

The controller requires an external 24 V, AC power source. Use a Class-2 transformer to supply power. Connect the transformer's neutral lead to the 24 VAC Common (- C) terminal and the AC phase lead to the 24 VAC Phase (~ R) terminal. Power is applied to the controller when the transformer is plugged in.

AAON recommends powering only one controller from each transformer. If installing a system with other controllers powered from a single transformer, however, phasing must be correct and total power drawn from the transformer must not exceed its rating.

### **Configuration**

To configure the controller, navigate the menus and change the setting by pressing a combination of the buttons. Press *Right* to open the Main Menu. Press *Left* to open the Override menu.

### General Navigation:

*Enter* - Select or exit value editing

*Up/Down* - Move among entries

*Left/Right* - Move among value fields

*Left* - Back or return to Home Screen

Humidity sensor option is dependent on the thermostat model. See AAON Mini Controller User's Manual for detailed operation, configuration, and setup information.



Figure 6 - AAON Mini Controller

### AAON Mini Controllers:

R80570 - Space Temperature Control

R80580 - Space Temperature and Humidity Control

### **Applications**

- Constant Volume Air Conditioner

- Single Zone Variable Air Volume Air Conditioner

- Constant Volume Heat Pump

- Single Zone Variable Air Volume Heat Pump

### **AAON**

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**Note:** Before calling, technician should have model and serial number of the unit and controller model number available for the service department to help answer questions regarding the unit and controller.

### **Important Notice**

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