Installation Guide

Application

The Accutrol Room Temperature Controller (RTC) is a wall mounted room temperature controller with algorithms designed for seamless integration with the AccuValve AVC electronic pressure independent airflow control valve. The RTC incorporates algorithms specific for use in the healthcare and life sciences where precise airflow tracking control is required. It is used for either constant or variable supply air volume applications with or without duct discharge temperature input. The RTC controller maintains accurate temperature control while the AVC maintains precise airflow amounts with large turndown capabilities

Planning for motion sensing

For models with a motion sensor mount the RTC on a wall that will have an unobstructed view of the typical traffic in the coverage area. When choosing a location, do not install the sensor in the following areas.

- Behind curtains or other obstructions
- In locations that will expose it to sunlight or heat sources
- Near a heating or cooling inlet or outlet.

The effective detection range is approximately 10 meters or 33 feet. Factors that may reduce the range include:
- The difference between the surface temperature of the object and the background temperature of the room is too small.
- Object movement in a direct line toward the sensor.
- Very slow or very fast object movement.
- Obstructions.

False detections may be triggered by:
- The temperature inside the detection range suddenly changes because of the entry of cold or warm air from an air-conditioning or heating unit.

- The sensor being directly exposed to sunlight, an incandescent light, or other source of far-infrared rays.
- Small animal movement.

Mounting the RTC

For the most accurate performance, install the RTC on an inside wall where it can sense the average room temperature. Avoid locations with direct sunlight, heat sources, windows, air vents, and air circulation or obstructions such as curtains, furniture, etc.

The RTC must not be:
- Mounted on an exterior wall.
- Mounted on or near an object with large a thermal mass such as a concrete block wall.
- Blocked from normal air circulation by obstructions.
- Exposed to heat sources such as lights, computers, copiers, or coffee makers, or to direct sunlight at any time of the day.
- Exposed to drafts from windows, diffusers, or returns
- Exposed to air flow through connecting conduits or empty spaces behind walls.

For models with motion sensing, see the topic, Planning for motion sensing.

Rough-in preparation

Complete rough-in wiring at each location before mounting the RTC. This includes the following steps.
- Install the supplied mounting base directly to a wall, a vertical electrical box, or a box with a wall plate kit.
- Routing the connecting cable or cables from the RTC to the equipment it is controlling.
- If required, install an appropriate wall plate kit.
- Block leaks and airflow from conduits with plumber's putty or similar material.
- If replacing an existing thermostat, label existing wires for reference when removing the existing thermostat.
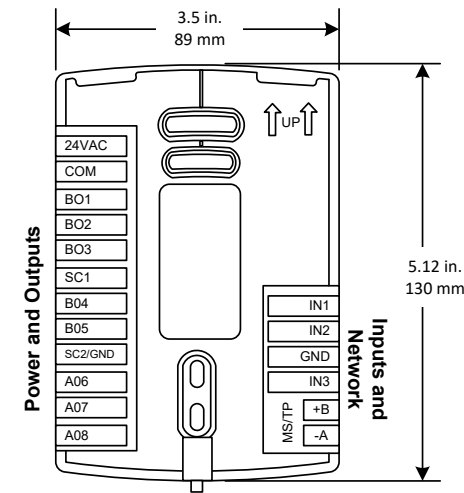
Installing the RTC

To install the controller on a mounting base, do the following:

1. Turn the Allen screw in the base of the sensor clockwise until it clears the case.

Turn clockwise to remove from base.
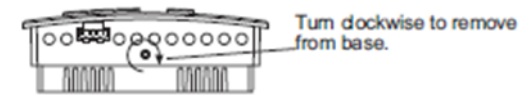
2. Swing the RTC away from the mounting base to remove it.

3. Route wiring for the RTC through the mounting base.

4. Position the base with the embossed UP toward the ceiling and fasten it directly to a vertical 2 x 4 inch electrical box.

5. Connect the wires for the RTC to the terminals in the mounting base.

6. Place the top of the sensor over the top of the mounting base and swing it down over the Allen screw bracket. Be careful not to pinch any wiring.

7. Turn the Allen screw counterclockwise until it backs out of the mounting base and engages the case.

Turn counterclockwise until the screw engages the base.

Caution

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

Connecting power

The RTC requires an external, 24 volt, AC power source. Use the following guidelines when choosing and wiring transformers.
- Use only a Class-2 transformer of the appropriate size to supply power. Accutrol recommends powering the RTC from a dedicated controls transformer.
- Connect the transformer's neutral lead to the COM terminal.
- Connect the AC phase lead to the 24VAC terminal.
- Power is applied to the controller when the transformer is powered.
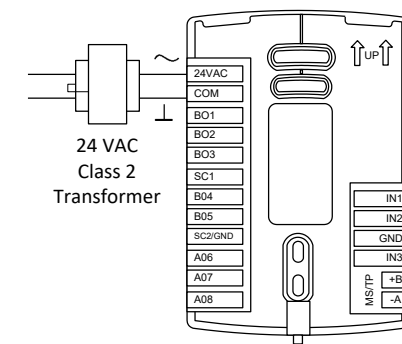

Wiring the RTC power

Connecting Inputs

The inputs for the RTC are configured for specific functions and do not require set up in the field. Not all inputs are required for every model or application.

Remote space temperature sensor (optional)

Connect a 10kΩ, Type II thermistor temperature sensor to the remote space temperature (IN1) input and ground (GND) terminals. The input includes the internal pull-up resistor. Follow the instructions supplied with the sensor for installation.
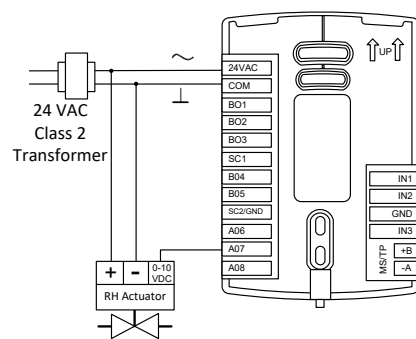
When a remote space temperature input is connected to the RTC, the remote temperature is used instead of the internal temperature

sensor.

Discharge air temperature
Connect a 10kΩ, Type III thermistor temperature probe to the discharge air temperature (IN3) input. The input includes the internal pull-up resistor. Follow the instructions supplied with the sensor for installation.
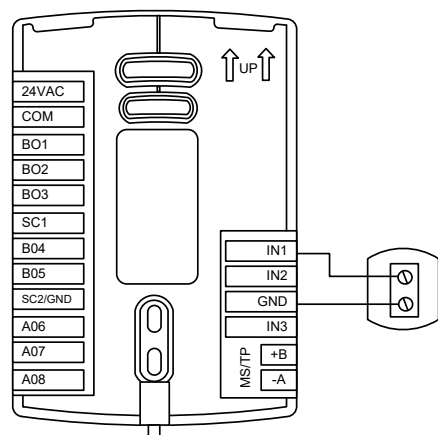
Wiring for remote space temperature sensor
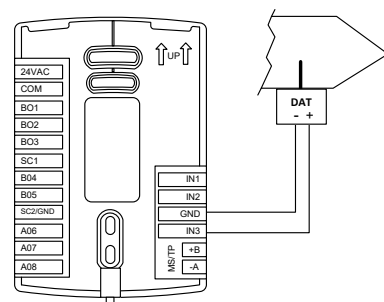
Wiring for Discharge Air Temperature Sensor

Connecting outputs
The RTC outputs are model dependent and are configured for specific use.
- Field programming or set up is limited to output action (direct or indirect).
- The RTC outputs are designed for 0-10 volt DC loads.
- The outputs represent analog signals.

Caution
Improperly connecting loads or equipment to output terminals may damage the equipment. Connect only as shown in the following diagrams or application drawings.

Connecting to modulating reheat valves
The following diagram shows the connections for a modulating reheat valves. The valve control signal (AO7) is a 0-10 volt analog output.
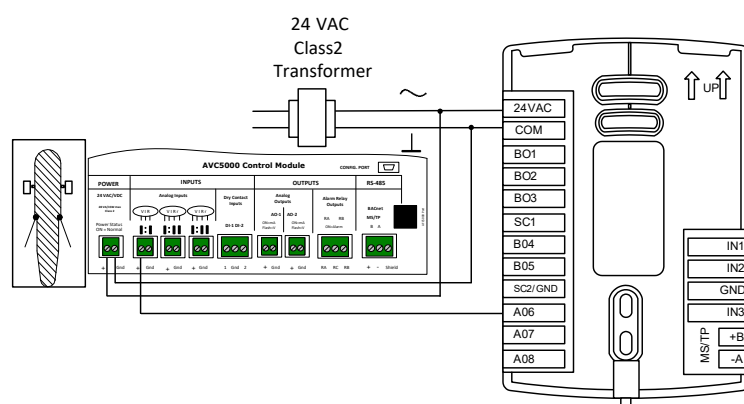
Modulating heating valves

Connecting to AccuValve Model AVC
The following diagram shows the connections for modulating supply air valves. The valve control signal (AO6) is a 0-10 volt analog output.

AccuValve AVC

RTC Parameter List
* Quick-Start Adjustable Parameter Settings

FUNCTION	DESCRIPTION	INITIAL
SETPOINT		
* Occ Cool	Occupied space temp. Stpt cooling	74°F
* Occ Heat	Occupied space temp. Stpt heating	70°F
* Unocc Cool	Unoccupied space temp. Stpt cooling	80°F
* Unocc Heat	Unoccupied space temp. Stpt heating	64°F
Min Cooling	Minimum space temp. Stpt cooling	68°F
Max Heating	Maximum space temp. Stpt Heating	76°F
Differential	Min temp. stpt differential; cool-heat	2°F
Stby Offset	Temp. stpt standby offset; cool-heat	0°F
DTS Setpoint	Duct temp calculated setpoint	72°F
* DTS Limit	Duct temp. stpt max limit	90°F
DTS Stpt Band	Duct temp. stpt band	15°F
SYSTEM		
Min Cool Airflow	Cool airflow output (AO6) min percent	0%
Max Cool Airflow	Cool airflow output (AO6) max percent	100%
Reheat Air Max%	Airflow output (AO6) max for heating	70%
Reheat Air Init	Heat output (AO7) min for additional airflow	70%
Air Vlv Action	Cool airflow output valve action	Direct
Heat Valve Action	Heat output valve action	Direct
Unocc Motion Timer	Dwell time to imitate unoccupied mode	15min
Occ Motion Timer	Dwell time to initiate occupancy mode	20sec
Local Ovrd Time	Local temperature stpt override time	60min
COMMUNICATIONS		
Device ID	BACnet device ID number	1
Mac	BACnet device MAC address	10
BAUD	BACnet communications BAUD rate	Auto
ADVANCED		
Units	Display units	English
Cool Prop	Proportional tuning parameter for cool loop	2°F
Cool Intg	Proportional tuning parameter for cool loop	0/hr
Heat Prop	Proportional tuning parameter for heat loop	2°F
Heat Intg	Proportional tuning parameter for heat loop	0/hr
Duct Reheat Prop	Proportional tuning parameter for DAT loop	2°F
Duct Reheat Intg	Proportional tuning parameter for DAT loop	0/hr
Password1	Operator user password	0
Password2	Configuration user password	0
Cal RTS	Internal temperature cal. offset	0
Cal ETS	External temperature sensor cal. offset	0
Cal DTS	DAT temperature sensor calibration offset	0
Dim Level	Display inactive dim percent	25%
Key Lockout	Local key lockout	None

Maintenance
Remove dust as necessary from the holes in the top and bottom. Clean the display with a soft, damp cloth and mild soap.

Specifications
RTC specifications are subject to change without notice.

Supply Voltage	24 volts AC (–15%, +20%), 50-60 Hz, 12 VA, Class 2 only
Inputs	0–10 volts DC with internal 10kΩ pull-up resistors
Analog outputs	Short protected 10mA 0–10 VDC
Environmental	Operating 34 to 125° F (1.1 to 51.6° C) Shipping –40 to 140° F (–40 to 60° C) Humidity 0 to 95% RH (non-condensing)
Regulatory	UL 916 Energy Management Equipment FCC Class A, Part 15, Subpart B and complies with Canadian ICES-003 Class A

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Important Notices
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