Automated Environmental Systems, LLC

REV. 071105

TSPOT® Analog Flush Mount Temperature Sensor ATS2000AC

FEATURES

- **Analog Celsius Temperature Sensor**
- **2 Analog Outputs Scaled to +10mV/°C & +19.6mV/°C**
- **Wide Measurement Range: +0°C to +100°C**
- **Typical Accuracy is ±0.6°C at +25°C**
- **Outputs Drive Any Cable, Including Category 5 Cable**
- **Screw-Down Terminal Block Connector**
- **Snaps Flush Into ¾" Hole in Drywall or Wood**
- **No Additional Hardware Required**

APPLICATIONS

- **Zoning**
- **Indoor Temperature Measurement**
- **HVAC Monitoring and Control**
- **Energy Conservation**
- **Window Covering Control**

DESCRIPTION

The ATS2000AC TSPOT (pronounced "tee-spot) is a well-designed rugged temperature sensor that permits inconspicuous operation indoors. It snaps easily into a ¾" hole in either drywall or wood. Small size, rugged construction and easy screw-down wire connections afford easy installation. The unobtrusive styling, high reliability and exceptional accuracy of the ATS2000AC make it a logical choice for many HVAC control and home automation projects

An installed ATS2000AC appears as a low profile, one-inch diameter disk that is paintable. A labeled four-position, screw-down terminal block connector is positioned in back of the sensor body to allow easy hookup with a compatible home automation controller or data acquisition system.

Operation of the ATS2000AC is extremely simple. Just connect the **+V** and **COM** terminals to a DC power source with a regulated output voltage between +5Vdc and +30Vdc. Take care to observe the proper polarity.

Once powered, the ATS2000AC produces two linearly scaled analog signals proportional to temperature when referenced to the **COM** terminal. Output signals are voltages between zero and +5V. These signals may be conveyed over more than 1000' of cable to the input of a compatible home automation controller or data acquisition system. The ATS2000AC is designed to drive all types of shielded and unshielded cables including twisted pair cables such as Category 5.

ATS2000AC – Uninstalled View

Shielded cable is recommended for electrically "noisy" environments. Connect the cable shield to earth ground or power supply common near the home automation controller or data acquisition system only.

The ATS2000AC is a low voltage device and should be adequately isolated from high voltage (110/220 Vac) wiring or devices. Please observe your local electrical code when installing low voltage devices.

ANALOG OUTPUTS

The **T10** output available on the ATS2000AC provides a direct reading of temperature using a common digital voltmeter. For example, a temperature reading of 25.3°C produces an analog signal on **T10** of (0.010V/°C x 25.3°C) = 0.253V. By simply moving the decimal point two places to the right (i.e. multiplying by 100) the proper value of 25.3°F may be derived.

The **T20** output available on the ATS2000AC offers increased resolution when used with a home automation controller or data acquisition system employing an 8-bit ADC (Analog-to-Digital Converter). An ADC's resolution determines the amount of analog signal change required to cause a corresponding change in the digital number available to the receiving system.

Scaling the **T20** output signal to 19.6mV/°C allows an 8-bit ADC to resolve a 1°C change in measured temperature. It also allows the digital number at the output of the ADC to be read directly without further conversion in software. For example, a reading of 50 at the output of an ADC monitoring the **T20** output will directly indicate a value of 50 degrees.

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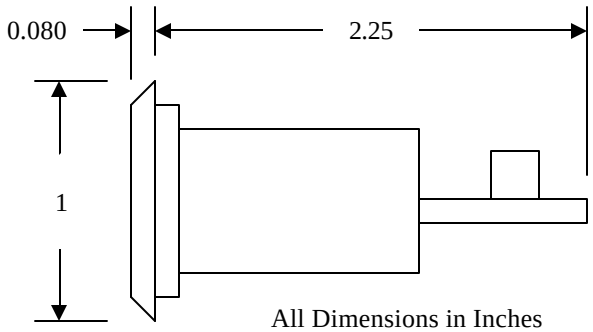
ATS2000AC TECHNICAL INFORMATION

TERMINAL NUMBER	SIGNAL NAME	INPUT/OUTPUT	SCALE FACTOR	DESCRIPTION
1	+V	Input	N/A	Voltage referenced to the COM terminal
2	T10	Output	10.0mV/°C	Temperature Signal (direct reading)
3	T20	Output	19.6mV/°C	Temperature Signal (scaled for 8-bit ADC)
4	COM	Input	N/A	Common (power supply & ADC common)

PARAMETERS	MINIMUM	TYPICAL	MAXIMUM
Temperature Measurement Range	0 °C		+100.0 °C
Accuracy	±1.5 °C	±0.6 °C	
T10 Output Signal Range (+10.0 mV/°C Scale Factor)	0 V		+1.000 V
T20 Output Signal Range (+19.6 mV/°C Scale Factor)	0 V		+1.960 V
Recommended Operating Temperature Range	+0 °C		+100.0 °C
Operating Voltage	+4.0 Vdc	+12.0 Vdc	+30.0 Vdc
Operating Current		+1.5 mAdc	+2.5 mAdc



All Dimensions in Inches

SUGGESTED INSTALLATION INSTRUCTIONS

1. Locate an appropriate site to install the ATS2000AC and drill a 3/4" diameter hole using a paddle bit. For HVAC control, it is not recommended to install an ATS2000AC where it may be exposed to temperature extremes such as in direct sunlight or near an air duct.
2. Run cable containing at least four individually insulated wires (three if only one of the two available temperature output signals will be monitored) between the ATS2000AC location and a controller or data acquisition system location. Shielded cable may be used.
3. Select a unique wire color and pattern (solid or striped) to be connected to each terminal of the ATS2000AC terminal block. Assign wires as required to be individually connected to the **+V**, **T20**, **T10** and **COM** terminals on the ATS2000AC terminal block.
4. At the ATS2000AC location, strip about 3/16" of insulation from the ends of the selected wires, and then connect each wire to the appropriate terminal on the ATS2000AC terminal block.
5. At the controller location, strip about 3/16" of insulation from the ends of the selected wires, and then connect the **COM** wire to the ground or common terminal of the controller's ADC (analog-to-digital converter). Next, connect the **T10** wire, **T20** wire or both individually, to available ADC inputs on the controller. Note that the controller manufacturer may require that the controller be powered OFF before connecting or disconnecting wires.
6. Connect the **+V** wire to a preset DC power supply with a regulated output between 4.0Vdc and 30.0Vdc. Note that the power supply common must be referenced (connected) to the controller's ADC common.
7. Connect the cable shield, if any, to earth ground or alternately to the power supply common terminal.
8. Carefully press fit the ATS2000AC into the predrilled 3/4" hole.

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