

TSPOT® Analog Flush Mount Temperature Sensor **ATS2000A**

FEATURES

- High Accuracy
- Wide Measurement Range
- Wide Input Voltage Range
- Multiple Analog Outputs
- Outputs Drive Cat 5 Cable
- Screw-Down Wire Connection
- No Hardware or Wall Plate Required
- No Termination Filter Required

APPLICATIONS

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

DESCRIPTION

The ATS2000A TSPOT (pronounced “tee-spot”) is a well-designed rugged temperature sensor that permits inconspicuous operation indoors. It snaps easily into a 3/4” 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 ATS2000A make it a logical choice for many HVAC control and home automation projects

An installed ATS2000A appears as a low profile, one-inch diameter disk that is paintable. A labeled four-position, screw-down wire 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 ATS2000A 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 ATS2000A 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 ATS2000A is designed to drive most types of shielded and unshielded twisted pair cables such as Category 5.

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.



ATS2000A – Uninstalled View

The ATS2000A 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 ATS2000A provides a direct reading of temperature using a common digital voltmeter. For example, a temperature reading of 75.3°F produces an analog signal on **T10** of $(0.010V/°F \times 75.3°F) = 0.753V$. By simply moving the decimal point two places to the right (i.e. multiplying by 100) the proper value of 75.3°F may be derived.

The **T20** output available on the ATS2000A 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/°F allows an 8-bit ADC to resolve a 1°F 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 100 at the output of an ADC monitoring the **T20** output will directly indicate a value of 100 degrees.

Automated Environmental Systems, LLC

TECHNICAL INFORMATION

ATS2000A CONNECTOR: Four-position screw-down wire connector

POSITION	SIGNAL NAME	INPUT/OUTPUT	SCALE FACTOR	DESCRIPTION
1	+V	Input	N/A	Voltage referenced to the COM terminal (+5Vdc min to +30Vdc max)
2	T10	Output	10.0mV/°F	Temperature Signal (direct reading)
3	T20	Output	19.6mV/°F	Temperature Signal (scaled for 8-bit ADC)
4	COM	Input	N/A	Common (power supply & ADC common)

ATS2000A SPECIFICATIONS:

PARAMETERS	MINIMUM	TYPICAL	MAXIMUM	UNITS
OUTPUT SIGNALS				
Temperature Output	+32.0		+150.0	°F
Accuracy at 77°F		±1.2		°F
T10 Output	0		+5.0	Vdc
Scale Factor		+10.0		mV/°F
T20 Output	0		+5.0	Vdc
Scale Factor		+19.6		mV/°F
TEMPERATURE				
Operating (Recommended)	+40		+150	°F
POWER SUPPLY				
Operating Voltage Range	+5.0	+12.0	+30.0	Vdc
Operating Current		+1.5	+2.5	mAdc

ATS2000A INSTALLATION INSTRUCTIONS

1. Locate an appropriate site to install the ATS2000A and drill a 3/4" diameter hole using a paddle bit. For HVAC control, it is not recommended to install an ATS2000A 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 ATS2000A 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 ATS2000A terminal block. Assign wires as required to be individually connected to the +V, T20, T10 and COM terminals on the ATS2000A terminal block.
4. At the ATS2000A 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 ATS2000A 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 5.0Vdc 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 ATS2000A in the predrilled 3/4" hole.

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