



HVAC

Temperature Sensor

SELECTION GUIDE



Advanced Thermal Products

Serving the HVAC Industry Since 1985

The Advanced Thermal Products Operation of Spectrum Sensors & Controls offers a world of high reliability temperature sensing products specifically designed for the HVAC market. For more than 20 years we've been a preferred supplier to many of the leading OEMs in the HVAC industry. We've engineered a family of rugged, moisture resistant temperature sensing probes and assemblies that have proven extremely effective in high moisture and freeze/thaw applications. Our temperature sensors can be found on large and small chillers, heat pumps, PTACs, boilers, furnaces, air handlers, zone controls and many more heating and cooling products.

Custom Application Specific Solutions

Rarely does a 100% Off-the-shelf temperature probe or thermistor satisfy the unique measurement and environmental demands of the HVAC industry. Although we specialize in the design of NTC thermistor sensors, our engineering team is thoroughly experienced in packaging RTD elements, silicon PTCs, IC temperature to voltage transducers, and digital temperature sensors. Our sensor solutions cover a temperature range from -50°C to over 350°C in both heating and cooling applications. In addition, the ATP family of products have been designed to be completely compatible with all major energy management and building automation systems in the market.



Now **customizing your temperature probe** is easier than ever... just **click** on the **Probe Configurator** on **SpecSensors.com** and we'll lead you through a range of variations and options to help us build a temperature sensor designed for your specific application.

Responsive Engineering & Customer Service

We understand the need for speed in today's fast paced product development world. Our engineers are prepared to either modify an existing sensor product or design a new "clean sheet" solution within a timeline that meets your requirements. Once a design is agreed upon, we'll often produce a prototype within 48 hours. And following production release, our customer service group will work with you for complete global logistical support, including schedule sharing programs.

World Class Quality ISO 9001:2000

As a business unit of Spectrum Control, Inc., ISO9001:2000 certified Spectrum Sensors & Controls adheres to world class manufacturing techniques ensuring each customer receives the Six Sigma reliability they demand. This commitment to quality has produced a reputation for dependability and resulted in preferred supplier status at many HVAC OEMs.

Low Cost Manufacturing Centers

Complementing our temperature sensor design and manufacturing facility in St. Mary's, PA are low cost production centers in Mexico and China. These highly efficient plants provide additional capacity and flexibility allowing us to schedule production globally and ramp-up to meet fast-track delivery requirements. Whether your requirement is for a small number of sensors or a high volume application, Spectrum is your source.



A Spectrum Control Business

Advanced Thermal Products Operation

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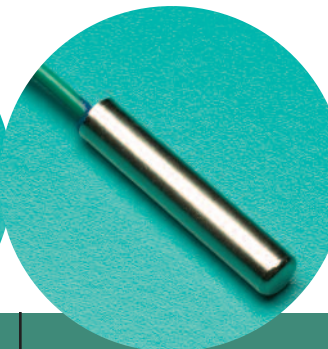


Surface

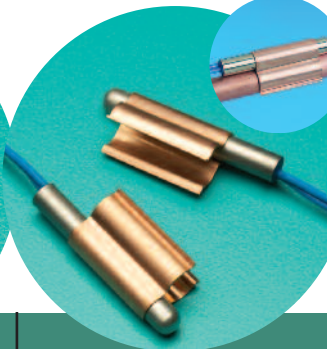
Ruggedized Temp Sensor



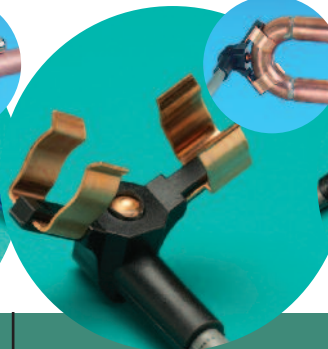
Moisture Resistant Temp Sensor



Clip-On Temp Sensor



Sens-A-Coil Temp Sensor



Strap-On Temp Sensor



Ideal for challenging high moisture applications with continuous freeze/thaw cycles

Provides solution for the primary cause of sensor failures in high moisture environments

Specifically designed to monitor the temperature of liquids in copper tubing with diameters from 3/8" to 5/8" OD

Patented design is the solution for sensing condenser and evaporator return bend temperatures

Rugged, low-cost sensor that's easy to install and offers fast thermal response

Addresses Ice Build-up:

Continuous freeze/thaw cycles provide ice an opportunity to exert a significant mechanical force on the wire or cable allowing water to breach the end seal of a standard sensor probe, thereby providing a direct path to the thermistor element.

Isolated Thermistor Element:

Our unique, swaged end design provides an excellent moisture seal between the cable and housing, isolating the thermistor element from outside moisture and stresses associated with freezing and thawing.

Eliminates Exposure to Moisture:

Many are mounted in areas subject to moisture due to condensation. Thermistors can be seriously affected by long-term exposure to moisture, which can cause low or erratic resistances. It is imperative that the internal construction of the probe assembly seals off all moisture paths to the thermistor.

Unique Internal Construction:

Our proven design provides an excellent moisture seal between all parts of the system and deters water from entering the assembly.

Moisture Resistant Seal:

Created by utilizing a special combination of wire and epoxies to help protect the thermistor-sensing element

Monitors Copper Tubing Temperature:

Many HVAC applications require a sensor that can monitor the temperature of a standard 3/8" or 1/2" OD copper tube, and field installation methods can vary widely.

Beryllium Copper Spring Clip:

Performs a dual function by holding the sensor rigidly in place on a straight section of 3/8" or 1/2" copper tubing while providing an excellent thermal connection from the copper tube to the sensor. This sensor is ideal for inlet or outlet refrigerant sensing in HVAC applications.

Monitor Refrigerant Temperatures:

HVAC engineers have long searched for cost effective, easy to install sensors capable of monitoring the refrigerant temperature in condenser and evaporator coils. In these applications sensor attachment has been a difficult design problem since the only suitable place to mount the sensor is on the coil return bend.

Plastic Overmolded Copper Clip:

Our specially designed clip has an integrated fast response thermistor element and snaps onto 3/8" return bends. The sensor is housed in a small bulb connected to the copper clips, maximizing sensing surface area.

Quick Installation:

The plastic molded body is designed to allow the use of a wire tie or hose clamp for quick installation of the sensor assembly.

Fast Response: Our small diameter aluminum tube allows for rapid responses to changes in temperature while the surrounding molded plastic housing isolates the sensor thermally from the outside environment and seals it from moisture.

Configurable with Solid-state Temperature Sensors:

The strap-on assembly can be configured with a range of solid-state temperature sensors from thermistors to RTDs to other types and is compatible with most major control systems.

Features:

- Rugged construction
- Tested to 10,000 freeze/thaw thermal cycles
- Waterproof to IP68
- Quick response and excellent thermal tracking
- Operating temperature range: -40°C to 105°C
- Standard with 3 ft. of AWG #22, PVC jacketed cable

Options:

- Variety of thermistor curves and resistance values
- Cable lengths and terminals can be specified
- Compatible with our Clip-On for 3/8" and 1/2" copper pipes

Features:

- Excellent for freeze/thaw applications
- Standard housing: 0.25" OD nickel-plated brass
- Wide operating temperature range: -40°C to 125°C
- Accommodates a wide array of thermistor sensing elements
- Standard with 10 ft. of AWG #22, PVC insulated zipcord cable

Options:

- Various termination types of connector pins or lugs
- Variety of thermistor curves and resistances available
- Cable lengths, housing types and wire styles can be specified

Features:

- Quick response and excellent thermal tracking
- Simple installation, attaches directly to pipe surfaces
- Low cost sensor
- Rugged construction: 0.25" OD stainless steel housing
- Moisture resistant internal assembly available
- Standard with 10 ft. of AWG #22, PVC insulated zipcord cable

Options:

- Variety of thermistor curves and resistances available
- Cable lengths and colors can be specified

Features:

- Easy installation - just snaps on
- Cost effective design
- Quick response and excellent thermal tracking
- Sturdy construction
- Standard with 10 ft. of AWG#22 PVC jacketed cable
- Well suited for use in HVAC diagnostic equipment and tools

Options:

- Sensor types including thermistor, RTD and other solid-state temperature sensors
- Range of sensor accuracies and values
- Cable lengths and styles, connectors and terminations can be specified

Features:

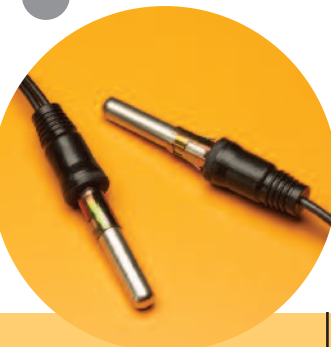
- Easy mounting, fits a wide variety of tube sizes
- Standard with 10ft. of PVC jacketed cable
- Small diameter aluminum tube allows fast thermal response
- Molded plastic body isolates sensor from outside environment
- Flat area on plastic holds wire tie or hose clamp

Options:

- Sensor types including thermistor, RTD and other solid-state temperature sensors
- Range of sensor accuracies and values
- Cable lengths and styles, connectors and terminations can be specified

Air

Snap-In Air Temp Sensor



Unique sensor mounting for accurate monitoring of air temperature in an enclosure

Designed for Accuracy: Previously, air sensors for enclosures had to be surface mounted, typically measuring the temperature of the sheet metal they were attached to instead of the air temperature of the enclosure.

Special Clip Design: Allows the sensor housing to be easily and securely snapped into a 0.30" diameter pre-drilled hole. This isolates the sensing element from the sheet metal allowing for an accurate reading.

Sturdy Construction: Our special clip design is added to our air temperature sensor that features a potted metal housing and a plastic molded body that thermally isolates the assembly from the environment.

Features:

- Easy installation - just snaps in to 14 to 18 gauge sheet metal
- Extremely accurate and responsive
- Low cost sensor assembly
- Extra strain relief - housing and plastic molded body provide additional protection
- Standard with 10ft. of PVC insulated leads

Options:

- Variety of thermistor curves and resistances available

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Handy Box (Duct) Temp Sensor



Ideal for HVAC duct temperature sensing applications

Accommodates Wide Array of Sensing Elements: Our duct temperature sensor can be configured using a variety of sensing elements including highly stable NTC thermistors, RTD elements and silicon based PTCs. This flexibility enables users to address their specific HVAC temperature application.

Easy To Use Package: To simplify installation, we utilize a standard 2" x 4" electrical utility box with mounting tabs, pre-formed knockouts for conduit connections and medical grade foam padding to absorb vibration.

Features:

- Mounting tabs for easy installation
- Quick response and excellent thermal response
- Wide operating temperature range: -40°C to 105°C

Options:

- Probe lengths of either 4" or 8"
- Weatherproof junction box

specsensors.com/dts

Air Temp Sensor with Flange



A low-cost, general purpose flanged temperature sensor for ducts or forced air systems

Rapid Response and Stable Mounting: The small diameter stainless steel tube allows for a rapid response to changes in temperature while the rugged flange allows for easy installation and stable mounting. This sensor is an excellent choice for furnaces, air handlers and similar applications.

Compatible with Major Control Systems: The air temperature sensor with flange is compatible with almost all major control systems on the market today.

Features:

- Easy mounting
- General purpose flanged design with 2 mounting holes
- All metal construction for ruggedness and fast response
- Simple, low-cost sensor
- Operating temperature range: -40°C to +100°C
- Standard with 10ft. of PVC jacketed cable

Options:

- Sensor types including thermistor, RTD and other solid-state temperature sensors
- Range of sensor accuracies and values
- Cable lengths and styles, connectors and terminations can be specified
- Various insertion lengths, flange sizes and styles

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Air Sensor Harness Assembly



Multi-connector electrical cable assemblies and wire harnesses built to individual specifications

Available In Many Designs: Our wire harnesses consist of a wide array of temperature sensor assemblies incorporating other electrical components such as other types of sensors, switches, relays, solder and crimp terminals, pins and much more.

Tooling, Support and Testing: As a leading manufacturer of cable assemblies and harnesses for the HVAC industry we have tooling available for many of the most popular connector systems and offer excellent design and engineering support. All cable and wire harnesses are fully tested to ensure they meet or exceed all electrical and mechanical specifications.

Features:

- Complete harness assembly including connector and all sensors
- Available with other types of sensors including humidity, pressure and others
- Simple, low-cost design

Options:

- Sensor types including thermistor, RTD and other solid-state temperature sensors
- Range of sensor accuracies and values
- Cable lengths and styles, connectors and terminations can be specified
- Sensor assembly styles including air, immersion, snap-in, clip-on and others

specsensors.com/ash

Standard Immersion Sensor



Our standard stainless steel immersion assemblies deliver fast thermal response in a rugged, low-cost package

Design Flexibility: The stainless steel housings are manufactured in a wide range of hex sizes, thread styles, thicknesses, material grades and immersion lengths to fit almost any immersion application.

Rugged Construction: The stainless steel housing is extremely rugged and sealed from the environment, assuring a fast response while protecting its sensing element.






Features:

- Easy mounting – threaded housing just screws in
- Fast thermal response and excellent thermal tracking
- Sturdy construction – housing sealed from the environment
- Suitable for sensing a wide range of liquids

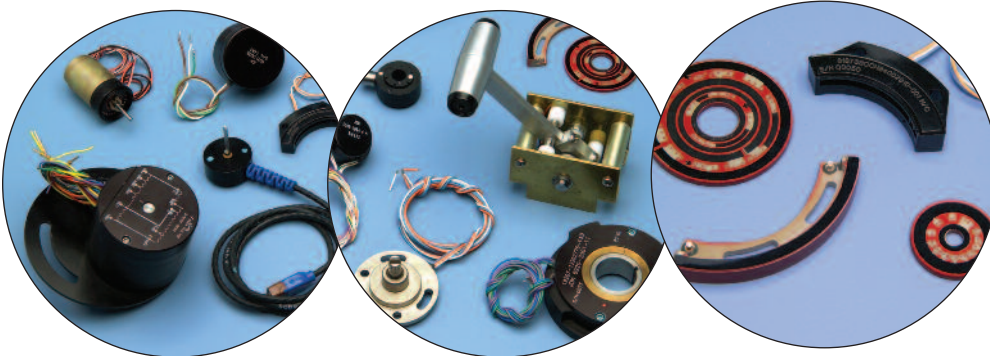
Options:

- Variety of hex sizes, thread styles and immersion lengths
- Sensor types including thermistor, RTD and other solid-state temperature sensors
- Range of sensor accuracies and values
- Cable lengths and styles, connectors and terminations can be specified
- Moisture resistant internal construction

specsensors.com/

Immersion				Motor
Sensor	Straight Stainless Steel Tube Sensor	Bent Stainless Steel Tube Sensor	Brass/Stainless Threaded Sensor	Motor Temp Sensor
				
less r onse ost	<i>Closed-end sensor assemblies designed for fast thermal response in a rugged, low-cost package</i>	<i>Closed-end bent SS tube sensor assemblies allow for installation and retention into a thermal well or compression fitting</i>	<i>Unique design eliminates inconsistent wall thicknesses and leaking housings in long insertion lengths</i>	<i>Reliable motor winding temperature sensors ideal for hermetic motors</i>
can be range es, wall des, and just lication.	<p>Design and Construction: The stainless steel tube can be manufactured in a wide range of diameters, wall thicknesses, grades of stainless steel and lengths. This general purpose design provides for a fast response and excellent thermal tracking.</p> <p>Sensing Element Protection: The tube provides excellent protection of the sensing element from various environmental conditions and can accommodate a moisture resistant internal construction for high moisture environments.</p>	<p>Design and Construction: The stainless steel tube can be manufactured in a wide range of diameters, wall thicknesses, grades of stainless steel and lengths. This general purpose design provides for a fast response and excellent thermal tracking.</p> <p>Sensing Element Protection: The tube provides excellent protection of the sensing element from various environmental conditions and can accommodate a moisture resistant internal construction for high moisture environments.</p>	<p>Consistent Design for Accurate Responses: The stainless steel tube is manufactured in a unique process that allows for consistent, reliable wall thicknesses allowing for accurate, fast thermal response for the embedded sensing element.</p> <p>Strength In Design: The stainless steel tube is brazed to a brass hex body that offers strength to the overall assembly while an integrated connector can be utilized to simplify the installation of the sensor.</p>	<p>Defeating Overheating and Failure: Failure or overstress conditions can cause hermetic motors to overheat and run beyond their rated temperature range, potentially shutting down the entire A/C system and leading to expensive repairs.</p> <p>Quick Reactions to Temperature Changes: Our rugged motor sensor is very reliable and reacts quickly to changing temperatures. All materials withstand the higher temperatures found in these applications, especially in the varnish and bake operations. Our epoxy case is extremely rugged and allows for a high isolation between the sensor and case and the sensor and lead wires.</p>
aded and ing housing nment wide	<p>Features:</p> <ul style="list-style-type: none"> Sturdy construction - all metal housing sealed from the environment Suitable for air and surface sensing as well as immersion Tubing can be altered/bent for retention purposes in thermowell <p>Options:</p> <ul style="list-style-type: none"> Variety of housing diameters (English and metric), lengths, wall thicknesses, and grades of stainless steel Sensor types including thermistor, RTD and other solid-state temperature sensors Range of sensor accuracies and values Cable lengths, styles and connectors can be specified 	<p>Features:</p> <ul style="list-style-type: none"> Bent tube design allows for easy insertion and retention Sturdy construction - all metal housing sealed from the environment Wide range of wall thicknesses and grades of stainless steel available <p>Options:</p> <ul style="list-style-type: none"> Variety of housing diameters (English and metric), lengths, wall thicknesses, and grades of stainless steel Sensor types including thermistor, RTD and other solid-state temperature sensors Range of sensor accuracies and values Cable lengths, styles and connectors can be specified 	<p>Features:</p> <ul style="list-style-type: none"> Unique brass/stainless design allows for rugged, reliable service for long insertion lengths Fast thermal response and excellent thermal tracking Brass hex provides strength Accommodates a wide variety of sensors <p>Options:</p> <ul style="list-style-type: none"> Variety of housing diameters (English and metric), lengths, wall thicknesses, and grades of stainless steel and brass Brass hex sizes Sensor types including thermistor, RTD and other solid-state temperature sensors Range of sensor accuracies and values Cable lengths, styles and connectors can be specified 	<p>Features:</p> <ul style="list-style-type: none"> Rugged design ideal for motor windings Epoxy case design provides rigidity and electrical isolation Withstands varnish and bake operations for hermetic motors Teflon insulated lead wires for extended range Wide range of tube diameters and lengths <p>Options:</p> <ul style="list-style-type: none"> Variety of housing diameters and lengths Sensor types including high temperature NTC thermistors, RTDs and other solid-state temperature sensors Range of sensor accuracies and values Cable lengths, AWG# and styles, connector and terminations can be specified
is	specsens.com/ss	specsens.com/bss	specsens.com/bst	specsens.com/mts

Position Sensor & Control Products



Motorized Potentiometers & Position Sensors

- Smaller size, greater reliability & longest life
- Smooth motor operation & infinite resolution
- Linear & rotary potentiometers & position sensors

Fader & Hollow Shaft Potentiometers

- Smooth velvet feel & excellent output smoothness for fader
- Smooth motor installation, infinite resolution and longest life for hollow shaft

Element Segments & Wiper Assemblies

- Custom configurations & assemblies
- Greater reliability & longest life
- Various non-linear tapers, taps & electrical angles



SPECTRUM CONTROL, INC.

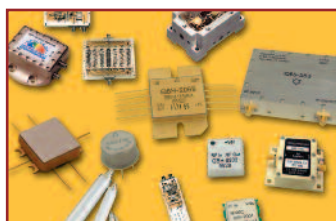
Our Family of Custom Solution Businesses

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- Specialty Connectors

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