Sensors for Healthcare

Temperature, Gas, Humidity and Pressure Solutions

Applications

- Chemical analyzers
- Dialysis
- Catheters
- Anesthesia
- Respiratory
- Thermometry
- Pressure monitoring
- Neonatal
- Hypodermic needle
- Patient monitors
- Sleep apnea
- Glucose monitoring

Amphenol Advanced Sensors is a single source for high-tech temperature and pressure sensors for both manufacturers and consumers. With more than 65 years experience, Amphenol leads the way in the design and manufacture o fhigh quality sensors for temperature, gas, humidity and pressure.

Constant investment in developing new materials and production methods means Amphenol is continually improving its performance across a wide range of products, from components to higher-level assemblies. Competitively priced solutions are developed in partnership with our customers' ever-increasing demands for quality, reliability and performance.

We offer a total capability in the field of thermistors— designing and manufacturing negative temperature coefficient (NTC), positive temperature co-efficient (PTC) thermistors, and units that combine the best features of both technologies.

Our wide range of international approvals reflects our commitment to excellence. We hold more than 100 quality approvals from recognized bodies around the world, including the first and only thermistor-based temperature standard traceable to NIST—field tested for 25 years and still holding calibration to within 0.001°C.

Amphenol

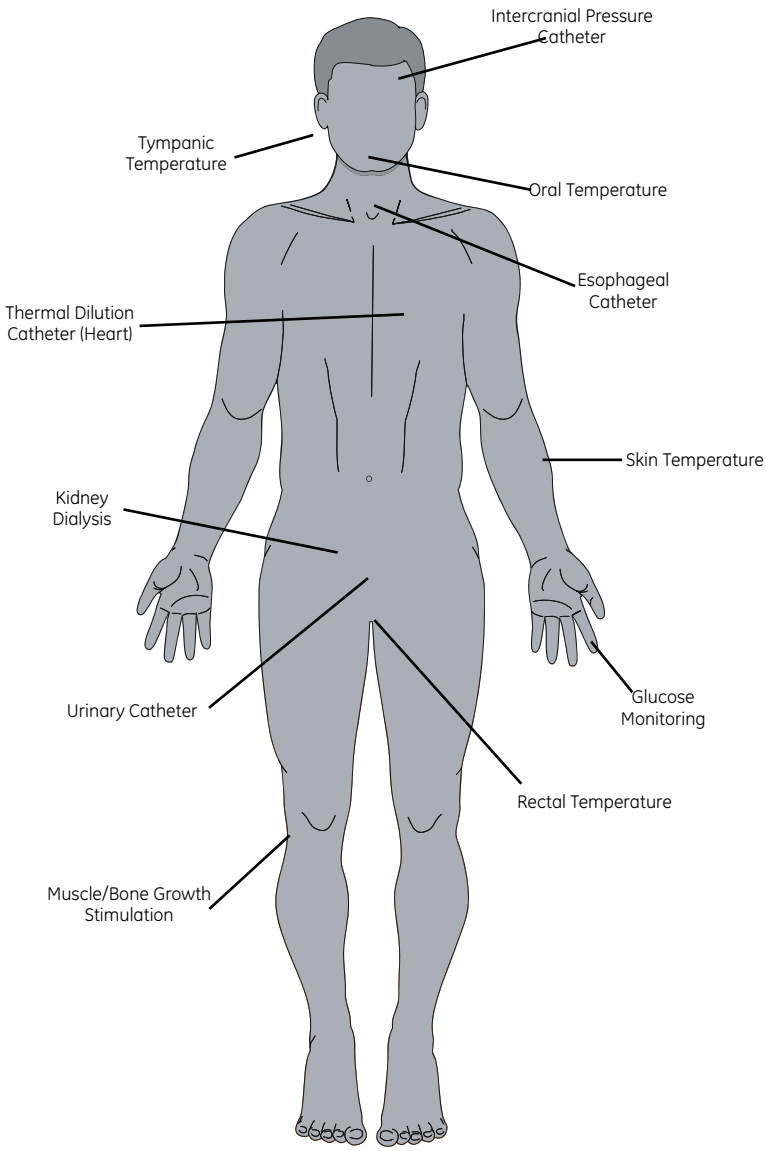
Advanced Sensors

Leading Edge Technology

Today's patient care demands the ultimate in accurate and reliable monitoring of critical parameters. Amphenol is a pioneer in the development of new and increasingly robust sensor technology for medical applications. We offer innovative solutions, fast development cycles and excellent quality control to meet the most stringent requirements. Our in-house design and modeling capabilities expedite the process of product development and ensure first-time success rates for temperature (thermistors and thermopile IR) and gas, humidity and MEMS-based pressure sensors.

We have developed state-of-the-art, high-performance sensors known for their accuracy, reliability and small size. They are used extensively for heart catheters, esophageal stethoscopes, fever thermometers, skin sensors, blood analyzers, incubators, respiration monitors and hypodermic needle sensors.

Innovative work on small precision sensors continues for cancer research. Thermistors measure the temperature of cells and with precise monitoring, doctors can use heat to destroy diseased cells in tumors.



Healthcare Applications

- Tympanic temperature
- Heart/lung machines
- Thermal dilution catheters (heart)
- Blood pressure monitors
- Urinary catheters
- Muscle/bone growth stimulation
- Oral, rectal and skin temperature
- Sleep apnea
- Esophageal catheters
- Glucose monitoring
- Body mapping
- Oxygen tents
- Clinical mattresses
- Humidifiers
- Anesthesia
- Fluid heaters
- Sterilizers
- Culture ovens
- Cryogenics

Although chemical analyzers have been used for many years, we are developing new products that range from large laboratory apparatus to small hand held devices. Our sensors monitor oxygen level for critical care and blood chemistry (including glucose, DNA and cholesterol), and for diseases such as HIV and cancer. The accuracy and small size of these devices mean that results that took time to process in the laboratory can now be available right at a patient's bedside.

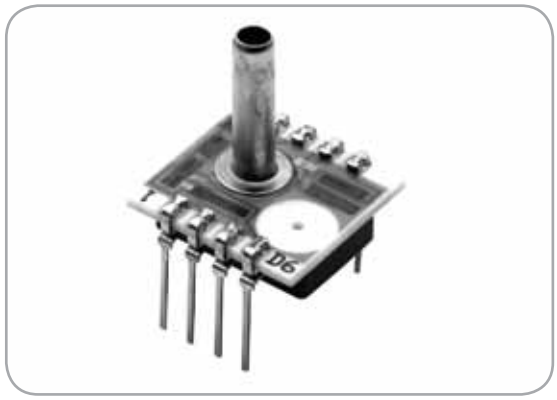
During dialysis, a patient's blood is removed from the body, artificially filtered by a machine, treated and returned to the body. Our NTC thermistor ensures that the blood is reheated to body temperature before it is returned.

Thermodilution catheters are used extensively in cardiac diagnostic and corrective procedures. Tiny NTC thermistors located near the tip of catheters are hermetically sealed in glass and have fine diameter platinum alloy leads welded to insulated extension leads. They are then inserted into hypodermic needles, catheters or other small housings that require extended leads. Disposable hypodermic needle sensors are especially critical during open heart surgery, when they are inserted into the myocardium muscle to monitor temperature. Hypodermic needle probes with small thermistor beads or chips can be inserted into targeted anatomical sites for temperature measurement and are particularly suited for cancer research and treatment, particularly for brain tumors.

Disposable pressure sensors are used primarily during surgical procedures and in the ICU to monitor patient heart rate and blood pressure. Pressure sensors in ventilator machines watch patients with respiratory illness or people on life support, helping control the amount of air pressure delivered to a patient's lung. They also monitor people with sleep disorders. During neonatal care, pressure sensors help physicians check the pressure within an expectant mother's uterus.

NTC thermistors monitor temperature and air circulation within incubators and skin temperatures of premature babies. Our biomedical chip thermistor assemblies are designed for oral or rectal patient temperature monitoring and also for continuous monitoring necessary during induced hypothermia and general anesthesia. NTC thermistor-based digital fever thermometers have replaced glass thermometers as the most widely used method for measuring human body temperature. Our reusable probe has a plastic or metal shaft, with the thermistor located in the metal tip.

Media Isolated High Pressure Sensors



Medium Pressure Sensor

Insulated Lead Chips

NTC Thermistors

Thermistors are thermally sensitive resistors with either a negative resistance/temperature coefficient (NTC) or positive resistance/temperature (PTC) coefficient. Amphenol offers a wide range of both types of thermistors from component level through complete assemblies. Both types of thermistors are solid state ceramic components, known for their exceptional quality and long life.

NTC thermistors are most often used for healthcare devices and are manufactured from the oxides of transition metals and can operate over the range of -196°C to 1000°C.

Key characteristics of NTC thermistors

- Defined sensitivity to temperature
- Sensitivity to electrical power input
- Sensitivity to changes in thermal conductivity

Main applications for NTC thermistors

- Temperature measurement and control
- Temperature compensation
- Surge suppression
- Power measurement
- Fluid level-flow detection

IR Sensors

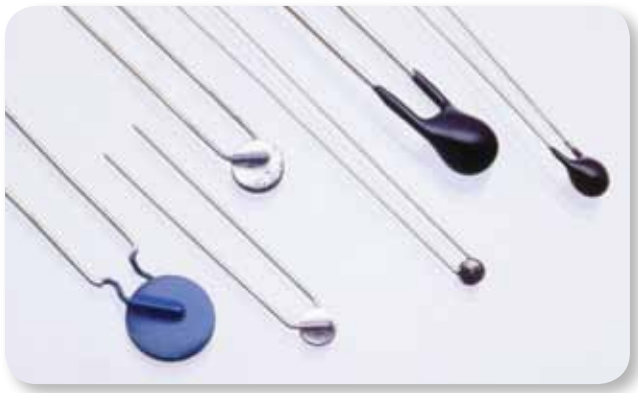
Thermopile IR temperature and gas sensors and silicon base humidity sensors use micro machining technologies and proven semiconductor manufacturing processes for quality, reliability and price competitiveness. IR sensors are used in applications such as tympanic ear thermometers when an accurate and instant non-contact temperature measurement is needed.

Key characteristics of IR sensors

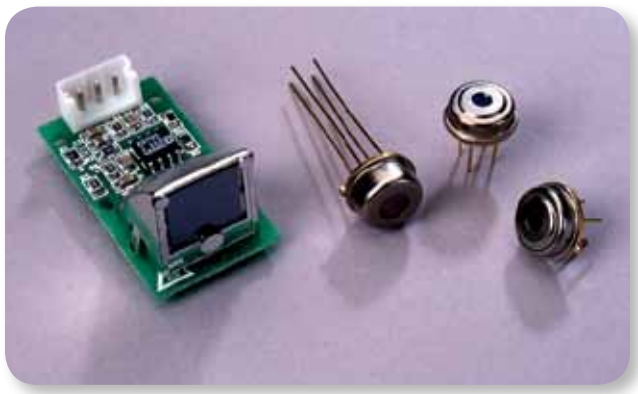
- High sensitivity and consistent accuracy
- Ultra small size
- Fast response time
- Low cost

Main applications for IR sensors

- Fever thermometers
- Ear thermometers
- Non-contact thermometers



NTC Thermistors



IR Sensors

Amphenol

Advanced Sensors

www.amphenol-sensors.com

AAS-BR-165B-03/2014