What are Thermistors?

- Components with variable resistance depending on surrounding temperature
- Typically use ceramics or polymers as conductive material (RTDs usually use pure metals)
- By relating temperature and resistance, temperature can accurately be measured
A Brief History

- 1833 - Faraday invents first known thermistor
- 1940s - Bell Laboratories improves production techniques
- 60/70s - Disc and Chip thermistors lower cost
- 80s - Disposable chip thermistors introduced to medical field

MICHAEL FARADAY WAS TERRIBLE AT MATH AND STOPPED GOING TO SCHOOL AFTER THE 1ST GRADE

YET HIS THEORY OF MAGNETIC FLUX ALLOWS US TO HAVE ELECTRICITY IN OUR HOMES TODAY

Two Main Types

- NTC vs. PTC
- NTC stands for Negative Temperature Coefficient
- PTC stands for Positive Temperature Coefficient
- Distinguish how resistance relates to increase in temperature

Comparison of PTC and NTC Thermistors
How do Thermistors Work?

- Thermistors are basically dynamic resistors that vary depending on temperature
- By using different materials, demands at different temperature ranges can be met
- PTCs increase resistance until equilibrium is reached
- NTCs are better for measuring temperature

Common Applications

- PTCs are used for:
  - Current limiters
  - Alternate for fuses
  - In diesel engines
  - Li Battery protection
  - Expand wax in wax motors
  - Overheating protection in electric motors
Common Applications

• NTCs are used for:
  • Thermometers for low temperatures
  • Power supply inrush current limiters
  • Measuring temperature in automotive, medical, residential, food handling, and many other industries

Citations

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