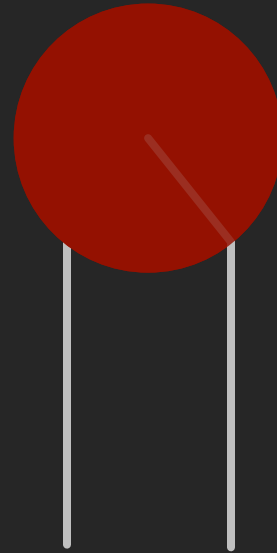


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# Thermistors

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## 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

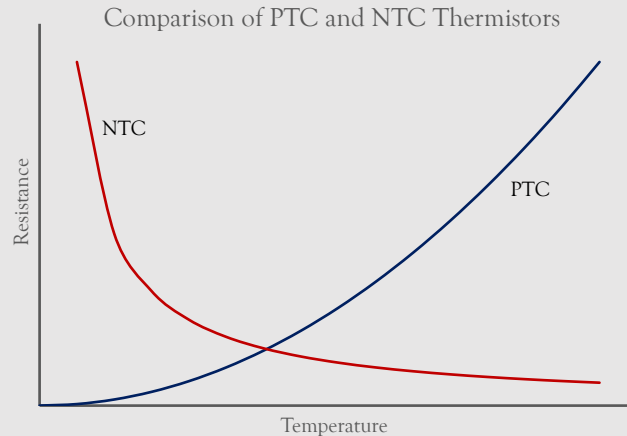
**MICHAEL FARADAY WAS TERRIBLE AT MATH AND STOPPED GOING TO SCHOOL AFTER THE 1ST GRADE**



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

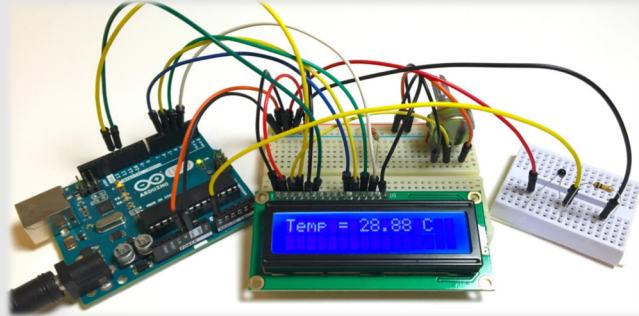
## Two Main Types

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



## 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



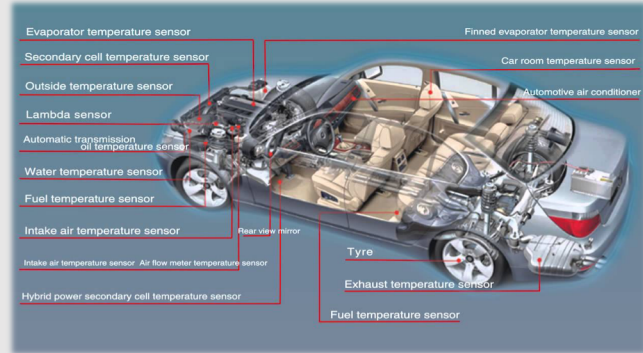
## Common Applications

- 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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