

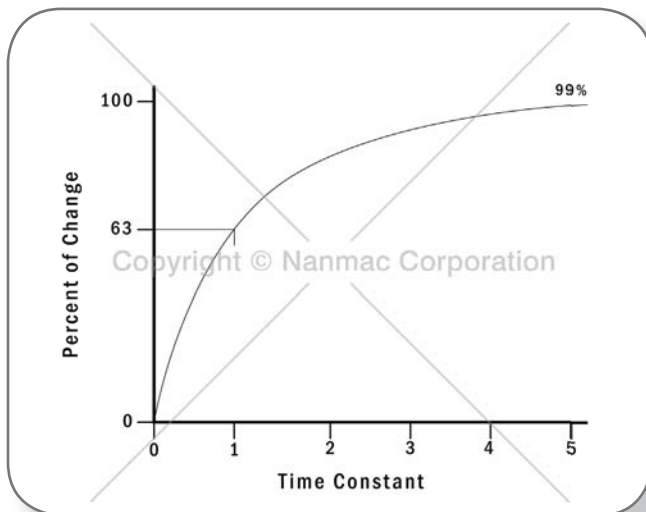
Comparison of Temperature Sensors and Response Times

Comparison of Temperature Transducers

	Thermocouple	RTD	Thermistor
Repeatability	2°F to 15°F	0.05°F to 0.1°	0.2°F to 2°F
Stability	1° to 2° drift per year	Less than 0.10% drift in five years	0.2°F to 5°F drift in one year
Sensitivity	10 to 50 microvolts/°C	0.2 to 10 ohms/°C	100 to 1,000 ohms/°C
Interchangeability	±0.75%	±0.5%	±0.5%
Temperature Range	-400°F to 4,200°F*	-200°F to 1,600°F	-150°F to 550°F
Signal Output	0 to 60 millivolts	1 to 6 volts	1 to 3 volts
Unique Features	Greatest economy; highest range	Greatest accuracy over wide spans; highly stable	Greatest sensitivity; lead effects minimized by high impedance
Linearity	Excellent	Excellent	Poor

Time Constants

The time constant of any sensor is defined as the time required for that sensor to respond to 63.2% of it's total output signal when subjected to a step change. The step change can be an increase in the parameter being measured. Five constants are required for a sensor to reach 99% of it's total change. The graph below illustrates this relationship.



Response Times of Sheathed, Grounded Thermocouples

