Thermistor

Thermistors are constructed of a wire or a thin layer of metal to form a precision resistor. The resistance of a Thermistor has a nonlinear dependence on temperature. The resistance changes very accurately and repeatably in a positive direction when heated. Thermistors are used in a variety of configurations to give the best accuracy of temperature measurement.

-260 to 850°C

-200 to 1800°C

-80 to 300°C

Current source required
Higher sensor cost
Smaller resistance change
Higher linearity
Wide temperature range

Best stability
Large variety of styles
Lowest stability
Lowest sensitivity
Cold junction reference needed
Nonlinear

Lowest resistance values
Low resistance change
Large resistance change
Two wire measurement
Low sensor cost
Small size / fast response

Resistance

Temperature

Output Voltage

Thermocouple

Thermocouples are constructed of two dissimilar metals welded together to form a junction. When this junction is heated, there is a thermoelectric potential (emf) created on the multivolt level. The change in resistance during a temperature change of a Thermocouple is usually 0°C has an output proportional to the difference in the two junctions temperatures. The resistance of a Thermocouple has a nonlinear negative change as it is heated. (Negative temperature coefficient) The resistance value changes very accurately and repeatably in a positive direction when heated. Thermocouples are used in a variety of configurations to give the best accuracy of temperature measurement.

-200 to 1800°C

-80 to 300°C

Resistance

Temperature

Output Characteristics

RTD

RTDs (Resistance Temperature Detectors) are constructed with a wire coil or a thin layer of metal to form a precision resistor. The resistance value changes very accurately and repeatably in a positive direction when heated. RTDs are assembled into a variety of configurations to give the best accuracy of temperature measurement.

-260 to 850°C

RTD's General Comparisons

Thermocouples

Thermistors