



Associated Calibration & Training Ltd

## Industrial Thermometer Guide

The selection criteria for an industrial thermometer should include:

- measurement range
- resolution of the reading 1 °C, 0.1 °C or 0.01 °C
- desired accuracy
- response time

ETI digital thermometers utilise one of three types of temperature sensors, thermocouple, NTC thermistor and resistance temperature detectors (RTD or PT100). Thermocouple thermometers and probes are fast to respond to changes in temperature, they also have a wide measurement range. Resistance temperature detector and NTC thermistor thermometers and probes are slower to respond to changes in temperature, but generally more accurate, although thermistor probes have a limited measurement range.

### NTC Thermistors

NTC thermistor probes are also based on a temperature dependent resistance change in the sensor element. But unlike resistance thermometer detectors, thermistors have a negative temperature coefficient, i.e the resistance decreases with increasing temperature.

### Resistance Temperature Detectors (PT100 or RTD)

Resistance temperature detector (PT100 or RTD) probes consist of flat film or wire wound platinum resistance sensor element. The measurement resistance value changes in line with the temperature being measured.

### Thermocouples

Thermocouple probes consist of two wires of dissimilar metals or metal alloys welded together. Thermocouples are based on the thermoelectric (Seebeck) effect. There are various types of thermocouple, types K and T being the most common, although type K is by far the most widely used.

