



# KD INSTRUMENTS

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With compliments from the team at KD INSTRUMENTS

The most common methods of measuring temperature by electrical means make use of one of the following:

**Thermocouples  
Resistance Temperature  
Detectors ie RTD  
Radiation (Infrared)  
Pyrometers**

Each of these sensors is described in detail in this section.

Thermocouples and R.T.D.'s are considered to be CONTACT SENSORS. Radiation pyrometers are distinguished as NON CONTACT.

The following table will aid you in selection between the two contact types.

**table 1**

CONSIDERATION	R.T.D.	THERMOCOUPLE
<b>Accuracy</b>	More accurate	Less accurate
<b>Temperature Range</b>	0.1 to 1.0°C Narrower -200 to 850°C	0.5 to 5°C Wider -200 to 2000°C
<b>Cost</b>	More expensive (two or three times)	Less expensive
<b>Sensitivity</b>	Stem Sensitive	Tip Sensitive
<b>Speed Response</b>	Slower	Faster
<b>Size</b>	Larger	Very small possible
<b>Thermocouple Reference</b>	Not Applicable	Required
<b>Surface Temperature</b>	Generally unsuitable	Suitable
<b>Measurement Vibration Effects</b>	Less suitable	Suitable (mineral insulated type)
<b>Power supply</b>	Required	Not Required
<b>Self-Heating</b>	Applicable	Not Applicable
<b>Long-Term stability</b>	Excellent	Less Satisfactory
<b>Robustness</b>	Less Suitable	More suitable
<b>Connecting Leads</b>	Ordinary Copper	Thermocouple Material to reference junction
<b>Output</b>	Resistance bridge approx. 0.4 ohms change per °C	E.M.F Generation base metal: approx 40 microvolts per °C Nobal metal: above 1000°C approx 10 microvolts per °C non linear
<b>Electrical "pick up"</b>	Less susceptible	More susceptible

The above table should be interpreted with caution. The information given shows average application experience, but some of the considerations can be modified by special design or selection.