



**Thermocouple**



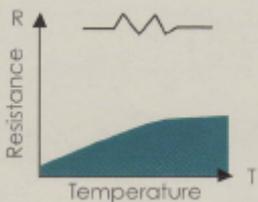
Thermocouple are pairs of dissimilar metal wires joined at least at one end, which generate a net thermoelectric voltage between the open pair according to the size of the temperature difference between the ends, the relative Seebeck coefficient of the wire pair and the uniformity.

Thermocouples	Advantages	Disadvantages
A graph showing the relationship between Voltage (V) on the vertical axis and Temperature (T) on the horizontal axis. The curve is non-linear and shaded in red. Above the graph is a simple schematic diagram of a thermocouple, showing two wires joined at one end and open at the other.	<ul style="list-style-type: none"><li>• No resistance lead wire problems</li><li>• Fastest response to temperature changes</li><li>• Simple, rugged</li><li>• High temperature operation</li><li>• Point temperature sensing</li></ul>	<ul style="list-style-type: none"><li>• Non-linear</li><li>• Low voltage</li><li>• Least stable</li></ul>

## Resistance Temperature Detector



Resistance temperature detectors or RTDs, are wire wound and thin film devices that measure temperature because of the physical principle of the positive temperature coefficient of electrical resistance of metals. When the temperature is increase, The value of the electrical resistance also increase. RTDs are best for application that need stable reading is essential for proper control. It can be used for most of the industrial measurements over a wide temperature range, RTDs are built assemblies with standard styles: 2, 3 or 4 wire; single or duplex elements.

RTDs	Advantages	Disadvantages
	<ul style="list-style-type: none"><li>• Most stable, accurate</li><li>• Contamination resistant</li><li>• More linear than thermocouple</li><li>• Most repeatable temperature measurement</li></ul>	<ul style="list-style-type: none"><li>• Expensive compare to thermocouple</li><li>• Slow response time</li><li>• Low sensitivity to small temperature changes.</li></ul>

Sheath of materials: S/S 316, S/S 304 and also available Teflon coating.

We can customize as per exact information laid down by our renowned customer. Below are the examples of thermosensor design.



**Teflon coated pocket with Bakelite thermocouple head**



**Ceramic Tube with exposed termination**



**Alumina tube for Thermal shock**



**Ceramic Tube with enclosed termination**



**Stainless Steel pocket and S/S Thermocouple head**



**Stainless steel pocket with Aluminium Thermocouple head**



**White teflon coated sleeving and Bakelite Thermocouple head**



**Flange mounting**

## **Mineral Insulated Thermosensors (MI)**

Beside than we can offer the thermocouple or RTD, we also have the mineral insulated temperature and also known as MI. The main advantage of the mineral insulated thermosensor is it has ultra-flexible permits bending. For the application such as the furnace that have tiny hole and need flexible probe, the MI is the best choice. We have sheath material: S/S 316, S/S 304 and Inconel 600 with wide range of diameters.

