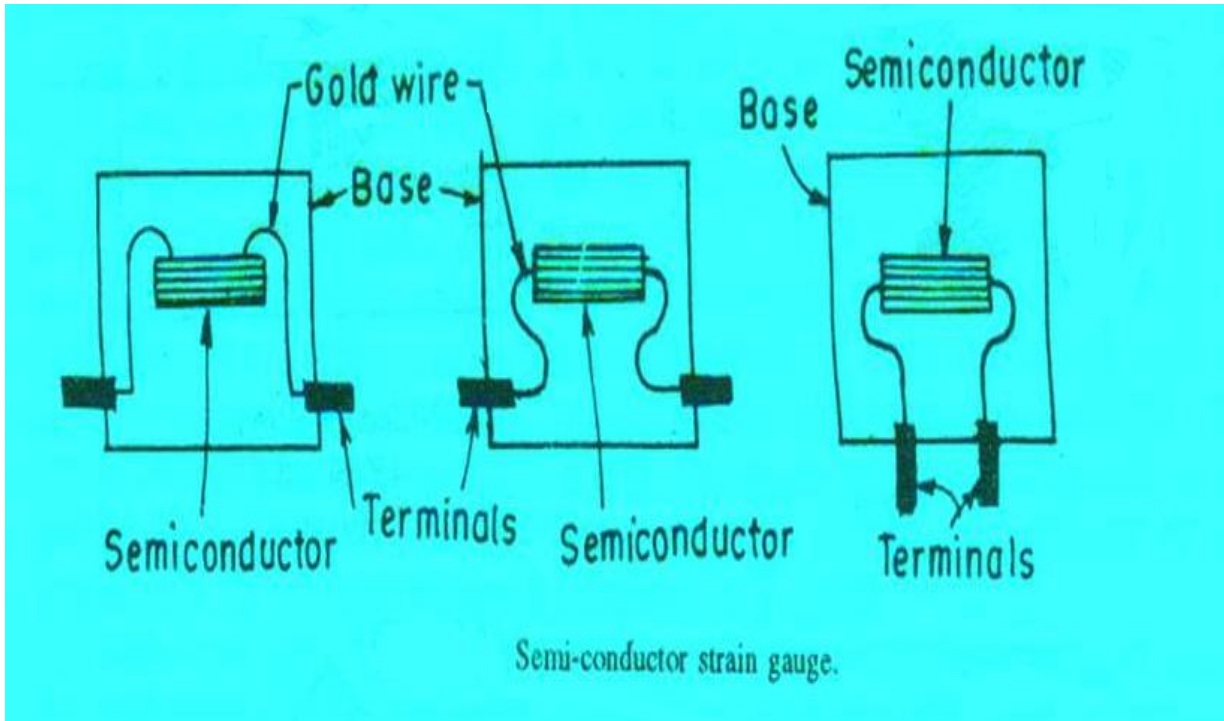


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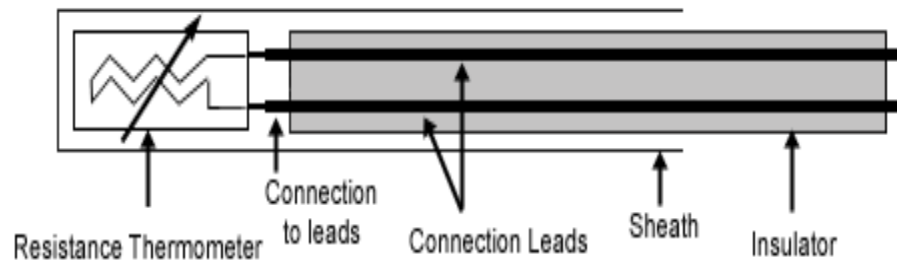
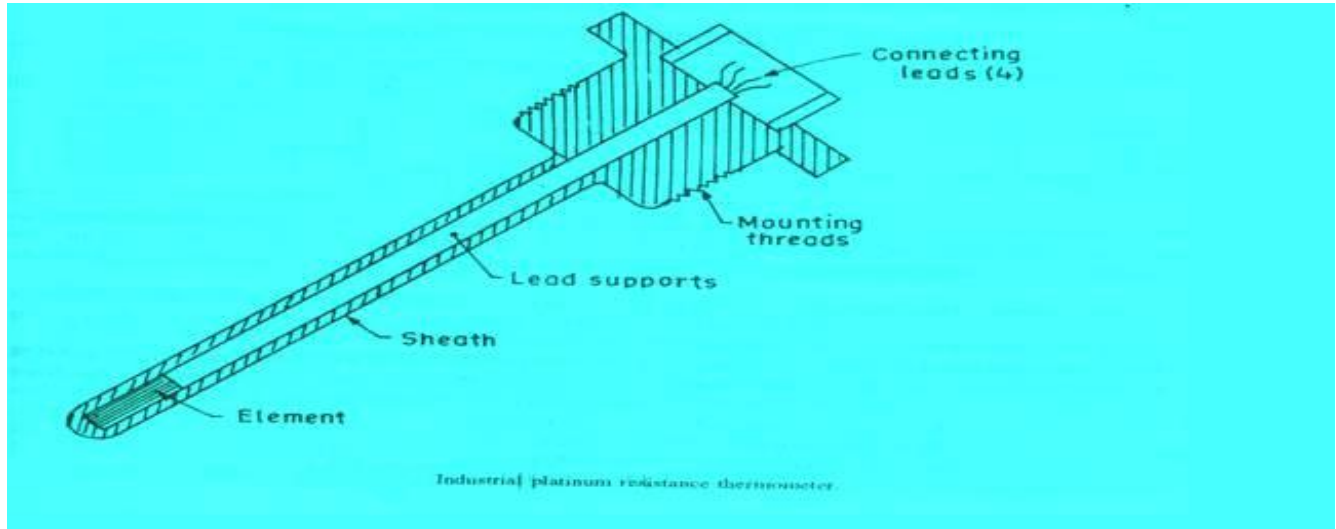
SEMICONDUCTOR GAUGE

- Semiconductor gauge are used in application where a high gauge factor is desired. A high gauge factor means relatively higher change in resistance that can be measured with good accuracy.
- The resistance of the semiconductor gauge change as strain is applied to it. The semiconductor gauge depends for their action upon the piezo-resistive effect i.e. change in value of resistance due to change in resistivity.
- Silicon and germanium are used as resistive material for semiconductor gauges.



RESISTANCE THERMOMETER

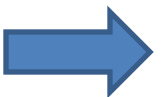
- Resistance of metal increase with increases in temperature. Therefore metals are said to have a positive temperature coefficient of resistivity.
- Fig shows the simplest type of open wire construction of platinum resistance thermometer. The platinum wire is wound in the form of spirals on an insulating material such as mica or ceramic.
- This assembly is then placed at the tip of probe
- This wire is in direct contact with the gas or liquid whose temperature is to be measured.



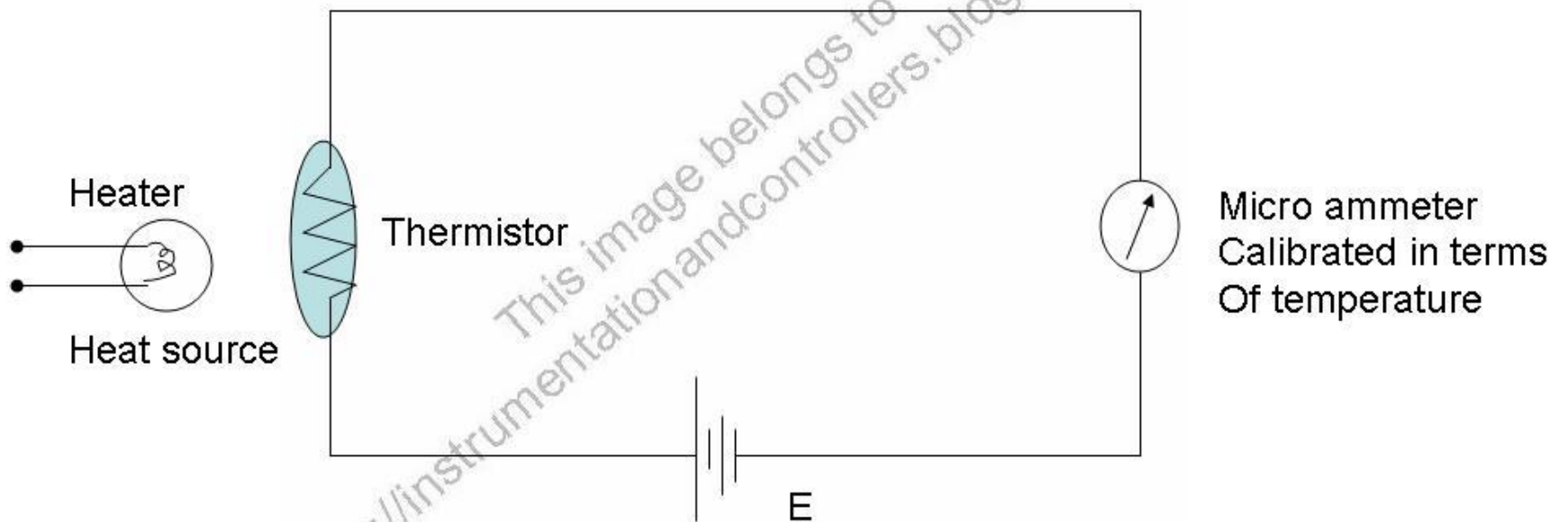
- The resistance of the platinum wire changes with the change in temperature of the gas or liquid
- This type of sensor have a positive temperature coefficient of resistivity as they are made from metals they are also known as resistance temperature detector.
- Resistance thermometer are generally of probe type for immersion in medium whose temperature is to be measured or controlled.

THERMISTOR

- Thermistor is a contraction of a term “thermal resistor”.
- Thermistor are temperature dependent resistors. They are made of semiconductor material which have negative temperature coefficient of resistivity i.e. their resistance decreases with increase of temperature.
- Thermistor are widely used in application which involve measurement in the range of 0-60° Thermistor are composed of sintered mixture of metallic oxides such as magnese, nickle, cobalt, copper, iron and uranium

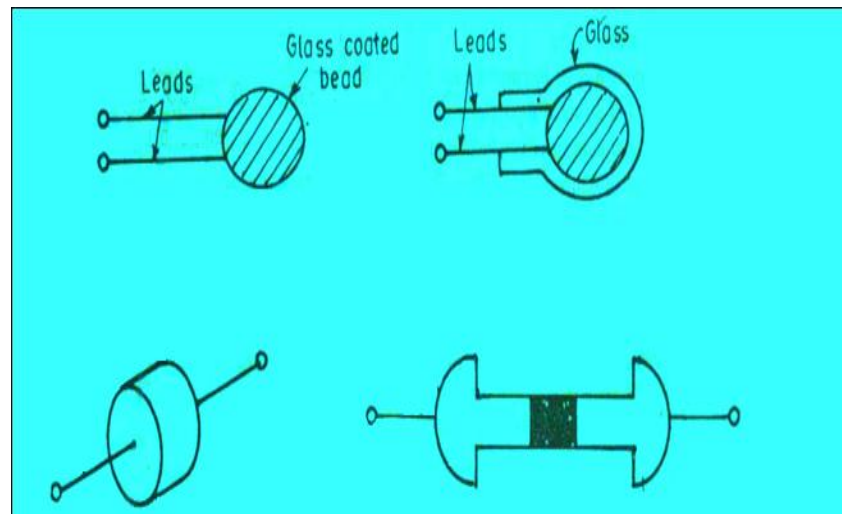


Temperature measurement using thermistor



Contd.

- The thermistor may be in the form of beads, rods and discs.
- The thermistor provide a large change in resistance for small change in temperature. In some cases the resistance of themistor at room temperature may decreases as much as 6% for each 1°C rise in temperature.

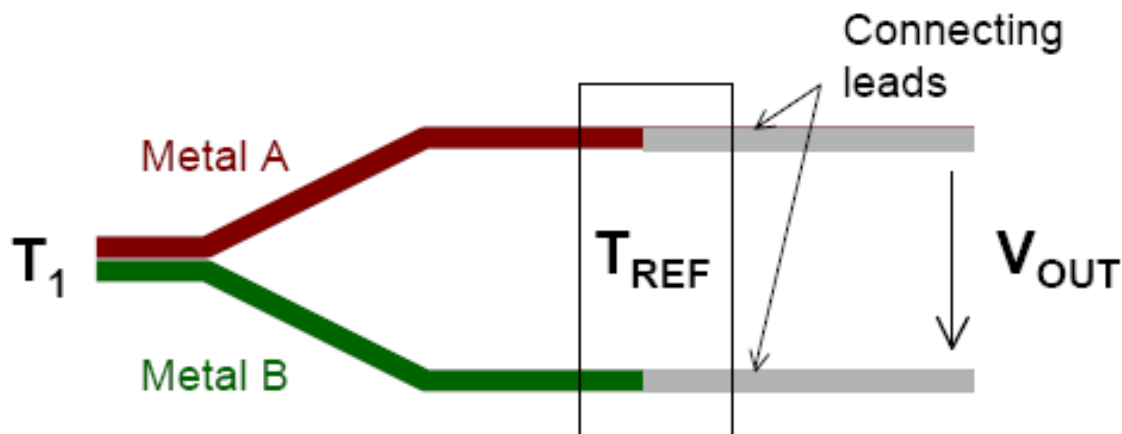


Thermocouples

Seebeck Effect

When a pair of dissimilar metals are joined at one end, and there is a temperature difference between the joined ends and the open ends, thermal emf is generated, which can be measured in the open ends.

This forms the basis of thermocouples.



Thank You