

Advantages ⇒

- ① High accuracy
- ② Wide temperature range - 200 to 650 °C
- ③ They are small in size
- ④ Fast Response
- ⑤ Good reproducibility
- ⑥ They are stable
- ⑦ Cost is high.

Disadvantages ⇒

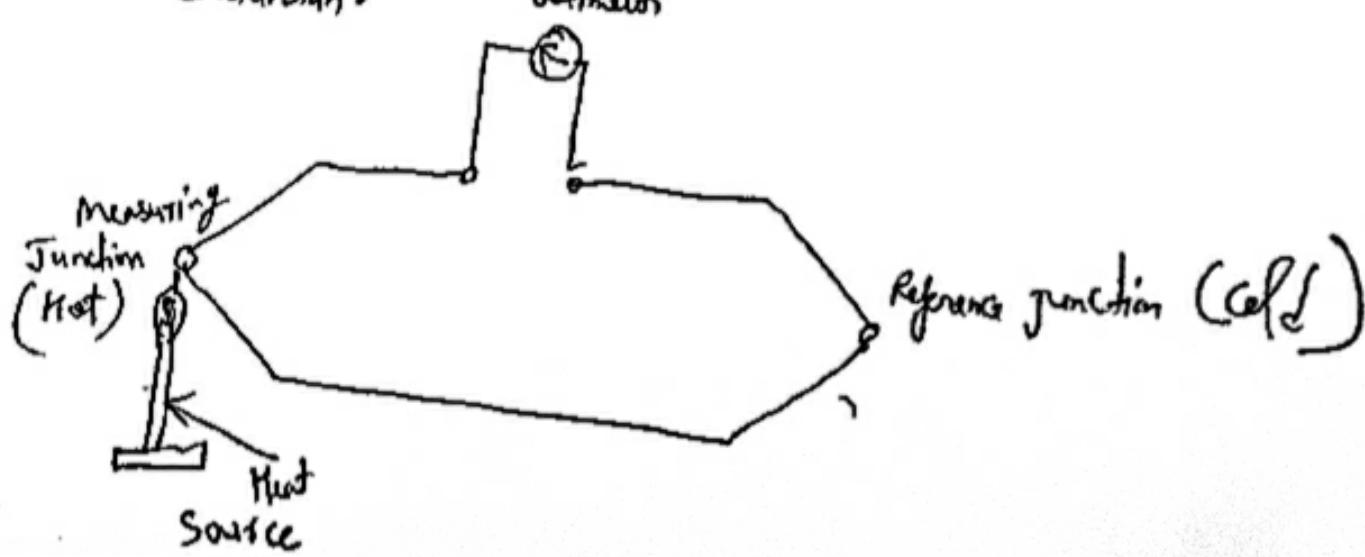
- ⑧ They have larger bulb size than thermocouple.
- ⑨ They induce mechanical abuse of vibration.

Thermocouple ⇒ The working principle of thermocouple depends on the thermo electric effect.

If two dissimilar metals are joined together so as to form a closed circuit, there will be two junction where they meet each other. If one of these junctions is heated, then a current flows in the circuit which can be detected by galvanometer. The amount of the current produced depends on the difference in temperatures between two junctions. It is also known as Seebeck effect.

Copper Constantan, Iron Constantan, Chromel alumel, platinum - rhodium and

Chromel - Constantan.



Heating the measuring junction produces a voltage greater than voltage across reference junction. The difference between two voltages is measured and voltmeter reading is converted to its corresponding temperatures.

Advantages :→ ① They have rugged construction.

② They are inexpensive.

③ They are simpler.

④ There is no need of a bridge circuit.

⑤ Accuracy high.

⑥ Good reproducibility.

⑦ Calibration checking is easily made.

⑧ Their output is adaptable.

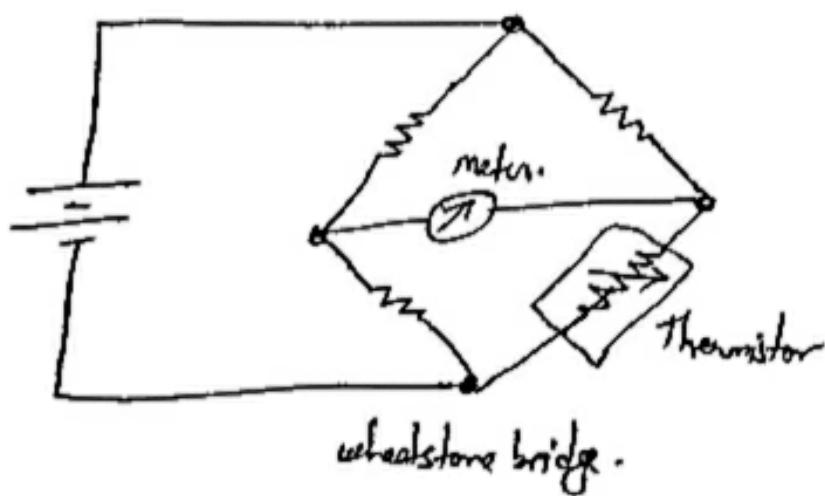
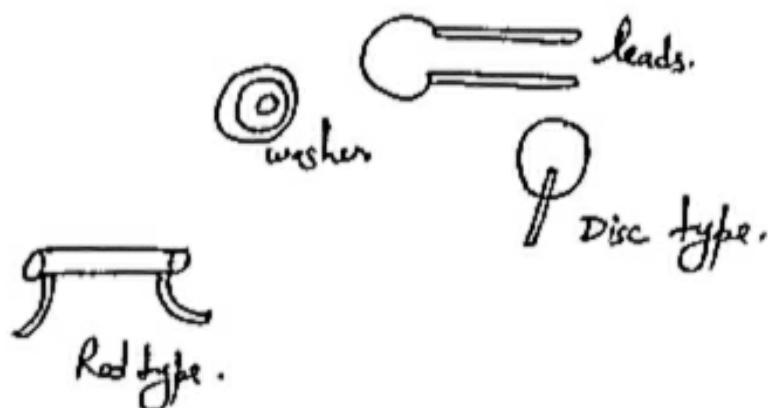
Disadvantages :→

① Temperature and voltage relation is non-linear.

② They require much amplifiers.

Thermistors

Thermistors are semiconductors made from a specific mixture of pure oxides of nickel, manganese, copper, cobalt, Iron, magnesium, titanium,



To measure temperatures with a thermistor, it is placed in the environment whose temperature is to be measured. As the temperature increases the resistance of thermistor decreases and vice-versa. Generally, the thermistor is placed as one leg of a wheat stone bridge circuit. At balance condition, when there is no change in temperature the galvanometer indicates zero. As the temperature increase or decrease the resistance also decrease or increase due to which bridge circuit is unbalanced. Thus an electric current flows through the galvanometer.

which indicates the temperature.

Advantages \Rightarrow ① They have small size and fast response.

- ② Their cost is low.
- ③ Stability high.
- ④ They are adaptable.

Disadvantage \Rightarrow ① They are limited in applications.

- ② They are unsuitable for wide temperature.
- ③ Temperature vs resistance curve is non-linear.