

# Thermocouples

## WHAT IS A THERMOCOUPLE?

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A thermocouple or thermocouple thermometer is a junction between two different metals that produces a voltage related to a temperature difference. Thermocouples are a widely used type of temperature sensor and can also be used to convert heat into electric power.

## ADVANTAGES

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- Cheap.
- Interchangeable
- Measure wide range of temperatures. Up to 2600°C.
- Can be made from a range of different metals.

## DISADVANTAGES

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- Not very accurate – system errors of less than one Kelvin (K) can be difficult to achieve
- complex with potential sources of error.
- susceptibility to corrosion and fragility

## HOW IT WORKS

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In a thermocouple circuit the current continues to flow as long as the two junctions are at different temperatures. So if the circuit is made with wire of the same material there is no current flow.

The magnitude and direction of the current depends on the temperature difference between the junctions and the properties of the metals used in the circuit. So if both ends are at the same temperature there is no voltage difference.



