



# Temperature Sensor

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## Introduction:

Temperature sensor is a fire alarm device designed to respond when the converted thermal energy of a fire increase the temperature of a heat sensitive element (thermistor). This device can be used at home, office, school, business places, conference rooms etc. Its application is to alert the presence of more heat in the particular place.

A thermistor is a type of resistor whose resistance varies significantly with temperature.

The electrical power input to the thermistor is just  $PE=IV$  where  $I$  is current and  $V$  is the voltage drop across the thermistor. The relationship between resistance and temperature is linear  $\Delta R=K\Delta T$

Where:  $\Delta R$ , Change in resistance and  $\Delta T$ , Change in temperature

$K$ , First-order temperature coefficient of resistance.



## Method:

Ohm's law states that the voltage ( $v$ ) across a resistor is proportional to the current ( $I$ ) where the constant of proportionality is the resistance ( $R$ ),  $V=IR$

If the components are connected by using a defined circuit it will work as temperature sensor.

Components used

PCB

Battery 9v

Thermistor 54.29k

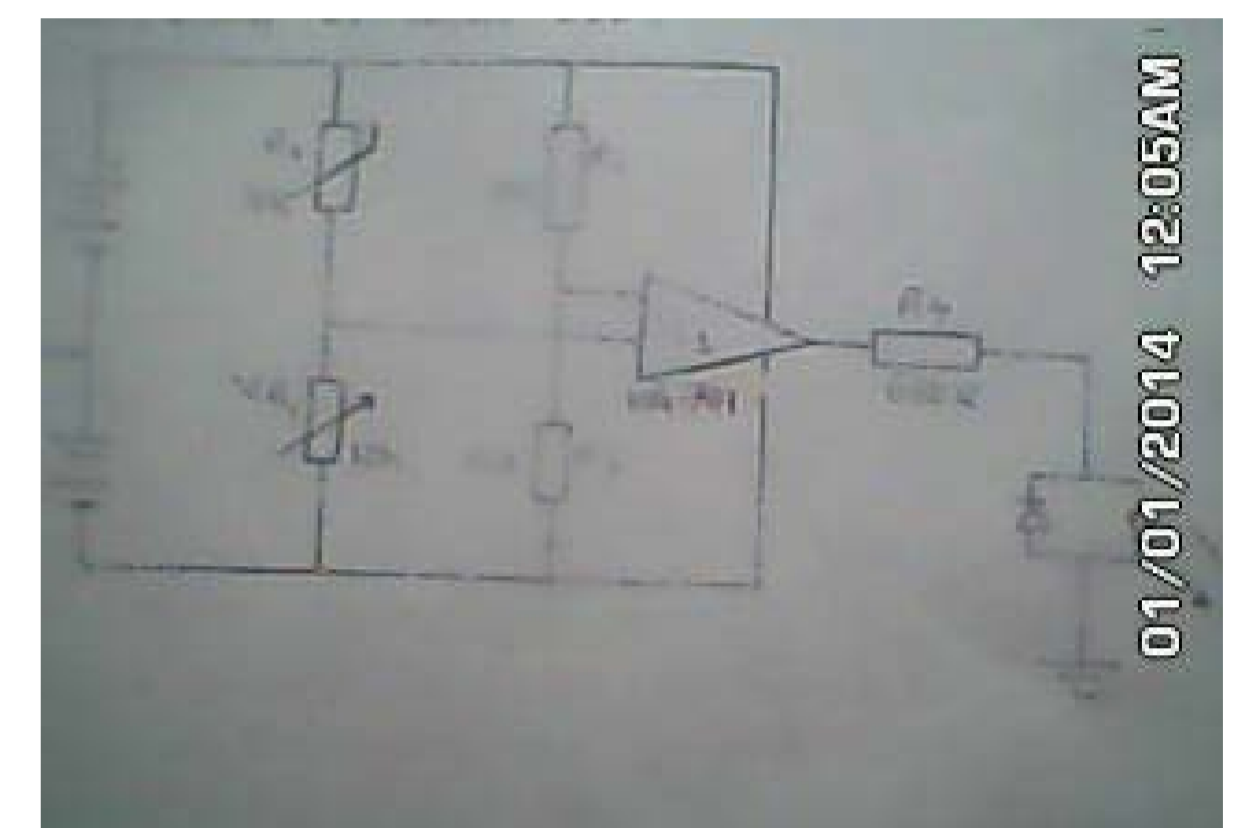
Resistor 680

JRC 4558 Operational amplifier

Resistor 100 k

Potentiometer 10k

Red/Green Bi-colour LED



## Results:

Temperature sensor makes use of an operational amplifier to check the temperature. The colour of LED will change as the temperature changes (green for cold and red for hot).

Temperature sensors measures the amount of heat energy that is generated by an object or system, allowing us to sense or detect any physical change to that temperature where the colour of the LED will change as the temperature changes from green for cold and Red of hot.

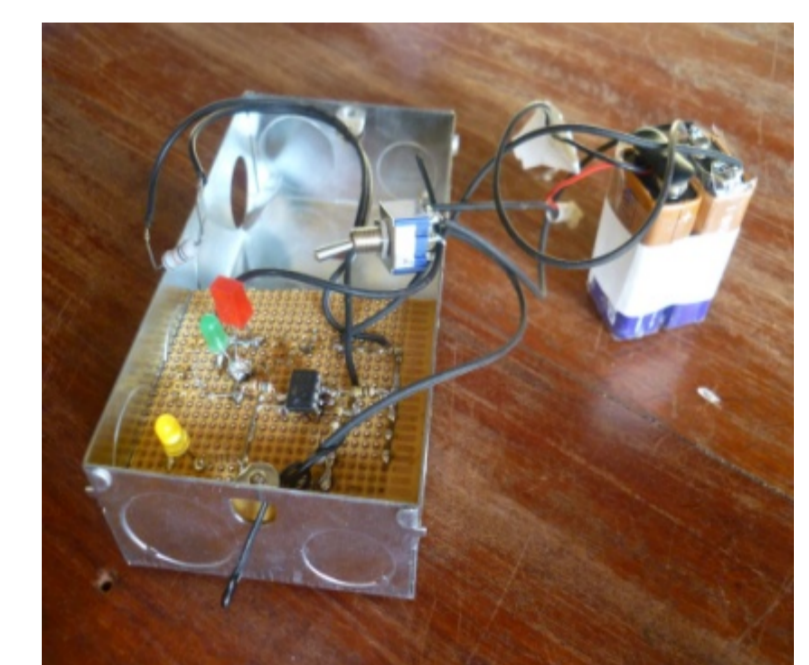
The temperature range of this device is 20c to 50c when the temperature reach 50c it will respond by producing a noise alarm from a buzzer connected in the circuit.

In making this temperature sensor we observed that there are many different types of temperature sensor available and all have different characteristics depending up on their actual application.

There is a contact temperature sensor these require to be in physical contact with the object being sensed. They can be used to defect solids, liquids or gases over a wide range of temperature.

Non –contact temperature sensor use convection and radiation to monitor changes in temperature. They can be used to defect liquids and gases that emit radiant energy as heat rises from an object in the form of infra- red radiation.

We have chosen to use contact temperature sensor because of its availability and easy to apply in a simple circuit.



## Conclusions

Doing a scientifically project is the very hard task if no support/ little support is provided some of he institute and companies which shown interest to support as were CRDB Bank , VETA and NMB Bank

The components used to make the device were collected from used electrical and electronics devices.

## References

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