

QUAID -E- AWAM UNIVERSITY OF ENGINEERING SCIENCE & TECHNOLOGY
NAWABSHAH

Department of Electronic Engineering

Subject: Instrumentation and Measurements 2nd term, 2nd Year 08ES Batch

Roll No _____ Date _____

4

To become familiar with

- **TEMPERATURE TRANSDUCER (THERMISTOR)**

APPARATUS:

- Instrumentation Transducer Trainer SIP380A
- Master Builder with Power supply
- Digital multimeter

TRANSDUCER:

It is a device used to convert one form of energy into another form, there are many types of transducers, one of them is Thermistor (Temperature transducer) used for temperature Measurement

THERMISTOR:

A thermistor is a type of resistor used to measure temperature changes, relying on the change in its resistance with changing temperature. Thermistor is a portmanteau of the words thermal and resistor. If we assume that the relationship between resistance and temperature is linear (i.e. we make a first-order approximation), then we can say that:

$$\Delta R = k\Delta T$$

where

ΔR = change in resistance

ΔT = change in temperature

k = first-order temperature coefficient of resistance

Thermistor can be classified into two types depending on the sign of k . If k is positive, the resistance increases with increasing temperature, and the device is called a positive temperature coefficient (**PTC**) Thermistor, If k is negative, the resistance decreases with increasing temperature, and the device is called a negative temperature coefficient (**NTC**) thermistor.

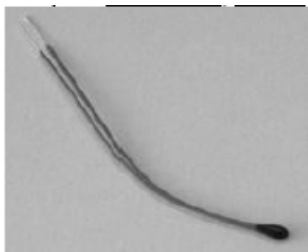
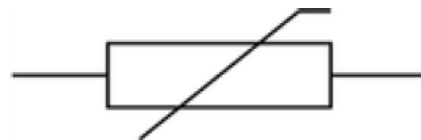


Fig) Thermister



Schematic symbol

PROCEDURE:

- a) Set the Instrumentation Transducer kit with Master Builder and Select the Section G for thermister on the right bottom of Trainer
- b) Initially all the Dip switches should be OFF.
- c) Measure room temperature with glass thermometer.
- d) Measure the Resistance at room temperature on point 45 and 48
- e) Now connect the ammeter in series with points 46 and 47.
- f) Switch on the main power supply of master builder and adjust the voltage from master builder according to the practical and then turn on the dip switch 2g to turn ON the power in Thermister section.
- g) Measure the current Scale at room temp as shown in fig 2
- h) Now turn ON the dip switch 1g to turn ON the Heater available in section G.
- i) Set the thermister near the Heater and Measure the Resistance

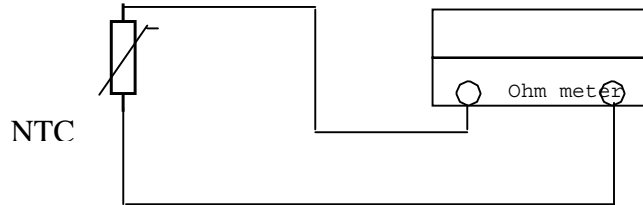


Fig 1.thermister connected to ohmmeter

Observations:

Thermister Model: _____		
<u>S.No</u>	<u>Temperature</u>	<u>Resistance</u>
1.		
2.		
3.		
4.		

REVIEW QUESTIONS:

Q # 01. Name the types of temperature transducers?

Q # 02. What is the function of thermister(NTC)?

Q # 03. What is the result on ohmmeter when heater gets close to Thermister(NTC) in fig 1?

Conclusion
