

Roll No _____ Date _____

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To become familiar with

- **TEMPERATURE TRANSDUCER (RTD)**

APPARATUS :

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

RTD:

Resistance temperature detector (RTD) is another temperature sensing transducer which can be used to measure high temperature. Unlike Thermistor which has Negative temperature coefficient, The RTD has positive temperature coefficient . when the temperature of RTD increases its Resistance is also increases. The Heart of RTD is an element which is generally made of wire wound ceramic core. The element is enclosed in a metal sheath probe which provides good heat transfer as well as protection against moisture. The sheath is generally made of stainless steel or some special metal alloy which can withstand high temperature. RTD elements are usually made of Platinum. Some RTDs have been made using copper, iron, nickel or tungsten. The element resistance usually calibrated at zero degree C, will increase as the temperature rises.

$$R_{t2} = R_{t1}(1 + \alpha\Delta T)$$

R_{t2} = is new resistance

R_{t1} is initial Resistance at reference point

α is the temperature coefficient

Δt is the Change in temp (t2-t1)

t2 is required temperature

t1 is the reference temperature

PROCEDURE :

- a) Set the Instrumentation Transducer kit with Master Builder and Select the Section G for RTD 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 of RTD at room temperature on point 49 and 50
- e) Now connect the ammeter in series with points 51 and 52.
- f) Switch on the main power supply of master builder and adjust

- the voltage from master builder according to the requirement and then turn on the dip switch 4g to connect the RTD to the input of Transistor amplifier.
- g) Now turn ON the dip switch 3g to turn ON the power in RTD circuit
 - h) Measure the current Scale at room temp as shown in fig 2
 - i) Now turn ON the dip switch 1g to turn ON the Heater available in section G.
 - j) Place the RTD element next to Heater and continue to measure the temperature

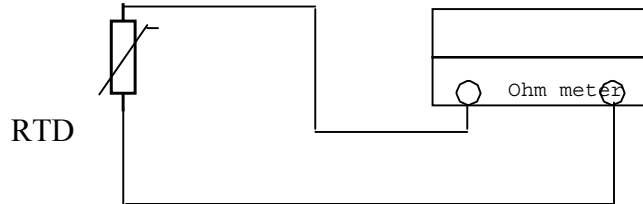


Fig 1.thermister connected to ohmmeter

Observations

RTD Model: _____		
S.No	Temperature	Resistance
1.		
2.		
3.		
4.		

REVIEW QUESTIONS:

Q # 01. What is the function of RTD?

How does the RTD differ from Thermister

Q # 02. Write some applications where rtd is used.

Conclusion
