

BFF3302 SENSOR AND INSTRUMENTATION SYSTEM

Temperature Transducer

By

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Chapter Description

- Aims
 - Obtain basic knowledge about temperature transducer.
- Expected Outcomes
 - Able to explain and describe about characteristics, working principle, and properties of temperature transducer.
- References
 - B.C.Nakra and K.K. Chaudhry, 2012. Instrumentation measurement and analysis, 3rd ed., Tata-McGraw-Hill.
 - Introduction to signal processing, instrumentation, and control : an integrative approach / Joseph Bentsman Hackensack, NJ : World Scientific Pub., 2016
 - Transducers for instrumentation / M. G. Joshi, New Delhi, India : Infinity, 2017
 - Instrumentation and measurement in electrical engineering / editor : Harinirina Randrianarisoa, New York : Arcler Press, 2017



Exercise/Problem

- A thermocouple with linear calibration: $0^{\circ}\text{C} - 400^{\circ}\text{C}$
- emf at max. temperature (reference junction temperature 0°C) is 20.68 mV.

a) Calculate the correction which must be made to the indicated emf if the cold junction temperature is 25°C .

b) If the indicated emf is 8.92 mV in the thermocouple circuit, determine the temperature of the hot junction.

Exercise/Problem

- Describe the characteristics and working principle of the following transducers:
 - Thermocouple
 - Thermistor
 - Resistance-temperature detector (RTD).

Include graph/diagram in the explanation.