High Temperatures Measurement in Industrial Equipment

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Abstract— This paper proposes a concise presentation of the main possibilities of temperature measurement in order to identify the methods and devices that can be used in high temperature domain. Ovens designed to heat treatment are achieving a constant evolution. News appears mainly in the monitoring and automatic control system of heat treatment processes that are taking place. Depending on the oven, the process will be conducted based on feedback reactions coming from the oven to the monitoring and control system. This system provides information about the specific conditions within the oven. The most important parameter to be monitored is the temperature, whether it relates to the temperature of the parts, air, or resistive heating elements. The measurement of these temperatures, within the frame of electrical ovens for heat treatments, is often accompanied by the use of the measurements results to control the dynamics of the technological cycles inside the oven. It is necessary the conditioning of the measured signals, in order to use them in the calculation and command blocks. In the paper there are highlighted the advantages of using thermocouples to measure high temperatures, as a result of the analysis for different ways of measurement with transducers. It is presented a measurement system based on signal conditioning for signals provided in numerical format through CI MAX31855.