WATER HEATER TEMPERATURE CONTROL USING ARDUINO UNO BASED PROPORTIONAL INTEGRAL DERIVATIVE (PID) CONTROL

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ABSTRACT

Technology in the industrial world is currently experiencing very rapid development. Over time the control system has become an important part of the work process in several industries. In the industrial world, there are many kinds of control system processes, one of which is the temperature control system. Water temperature control system is one of the most important applications. Therefore, an Arduino Uno-based water heater temperature control system is made with the PID method. The use of a heater found in the dispenser as a tool to heat water, then the water is heated as needed using an AC light dimmer that controls the heater, and the DS18B20 temperature sensor reads the temperature. The temperature is kept stable according to the setpoint controlled from 60-100 °C by the PID control system. The test results of the fastest water heating time with parameter values Kp 6,5, Ki 0,08, Kp 0,1 are located at a temperature setpoint of 100 °C, which is 6 minutes. In the 90 °C temperature setpoint test results, it takes 7 minutes to heat water with a temperature stability value of 93,75, so a steady state error value of 3,75 is obtained.

Keywords: *Temperature sensor DS18B20, PID control, Arduino Uno, AC light dimmer.*