ABSTRACT

Water temperature control is needed in some factory and in some ways like the water temperature suitable for some types of fish, the water temperature for coffee, the temperature of the bath that fit, even making the milk so that the protein is not broken, and so on. Electric water heaters in General can only heat water, without temperature control. The author will try to make the heater that can control the temperature of the water with a time duration can be set so that it can be interspersed with work on other activities.

In this final project will be designed systems that can regulate temperature, with temperature setpoint 80 ° C which can set the duration of the pemanasannya. Control system used is the merging of the Fuzzy Logic Proportional and Integral Controller. Previous studies have tried to use Fuzzy Logic or control Proportional Integral. The response from the previous system there is still a drawback, a system that slow response and can not control the duration of heating, for it to be tested using two such control. In this final task microcontroller used as the basic controller is the Arduino Uno. By using the DS18B20 temperature sensor as. The *Keypad* to set the time and will ditampilakan on Liquid Chrystal Display.

Once implemented the Fuzzy Logic and Proportional Integral Controller can achieve the desired setpoint by travel time appropriate input and can keep the temperature is fixed at 80°C. The average value of system error for each input is 1.13 minutes.

Keywords : *Fuzzy Logic Control, Proportional Integral Control*