

## ABSTRACT

*Bioethanol is an alternative fuel sourced from lignocellulose biomass. In the process of making bioethanol, the pretreatment process is the most important process because in this part the conversion of lignocellulose biomass is carried out. In the process there is a stage of delignification with two systems namely batch and continue. The two systems are distinguished by the main reactor used. One of the methods used is to provide high temperatures on the main reactor jacket. This study focuses on the automation of simulation-based temperature monitoring and control systems in the continue system. Automation of the system is carried out on electrical oil heater (TT 204), 3 way-valve (TT 201) and on/off system at the pump. Analysis of sensor reading data on batch systems will be reviewed for continued systems. The results obtained  $k_p$ ,  $k_i$ ,  $k_d$ , overshoot, rise time and settling time values of 0.083847, respectively; 0,020068; 0,025162; 0,475%; 6.34 s and 40.4 s on TT 204. While the control in TT 201, parameter values  $K_p$ ,  $K_i$ ,  $K_d$ , overshoot, rise time and settling time of 1.4088 each; 1,6978; 0,29225; 0,847%; 5.47 s and 8.03 s. Tests conducted on GX Works 2 and GT designer 3 software were successfully performed for pump on/off systems and the provision of register data values for each temperature control. However, the Process Value (PV) parameter was not successful because the sensor reading value had to be done in real time and not simulation-based. On batch and continue systems have some differences from the hardware used. However, the two systems have the same principle of cooperation.*

*Keywords: Batch and Continue, Bioethanol, Simulation, System Automation.*