

SUMMARY

Wirangga Luvianca, Department of Electrical Engineering, Faculty of Engineering, Brawijaya University, December 2015, Water level Control System Using Digital PID In Water Tank Plant, Supervisor: Erni Yudaningtyas and Rahmadwati.

The controller is the key component of the control system that serves to change the feedback signal and the reference input signal (setpoint) or the error signal into a control signal. Water tank plant 73426 at Control System Laboratory Brawijaya University currently using analog PID controller, the controller is able to control the plant well. Digital PID using microcontroller dominates the industry today. Many of the benefits from microcontroller based are capable of using complex control algorithms, lighter weights and more immune to external noise. For take part of revolution in industrial technology, conducted development digital PID controller for water tank plant 73426.

In this study, the use of PID controller based on PID control capability which has fast response, so that suitable for water tank plant. The process of designing PID control using first method Ziegler – Nichols to provide input in the form of unit step and get the S- shaped response, that S curve can be characterized into two constants, the delay time L and the time constant T, followed by search of PID control parameters through tuning table Ziegler – Nichols PID Controller parameter values obtained by $K_p = 3,46$ $K_i = 0,96$ and $K_d = 3,11$.

The result of digital control design for water tank plant 73426 applied to the 3 set point at height of 7 cm, 8 cm and 9 cm. the controller work well in all set point with an error steady state within a tolerance of 5%. When the disturbance is given, the system can handle it and restore to the steady state quickly.

Keywords : Water level plant (73426), water level control, PID control, HC-SR04 Sensors.