

ABSTRAK

RANCANG BANGUN SISTEM KENDALI AIR PADA TEMPAT PENAMPUNGAN BERBASIS *PROGRAMMABLE LOGIC* *CONTROLLER* (PLC)

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Permasalahan banjir akibat air berlebih memerlukan sistem kendali berbasis *Programmable Logic Controller* (PLC) yang mampu mengelola proses pengisian dan pengosongan air secara otomatis. Penelitian ini merancang dan menguji sistem kontrol penampungan air dengan dua pompa DC, serta mengukur parameter tegangan, arus, daya, dan debit air. Hasil menunjukkan bahwa Pompa DC 1 beroperasi pada 23,9 V, 1,98 A, dan 45,8 W, sedangkan Pompa DC 2 bekerja pada 23,9 V, 1,79 A, dan 42,7 W, dengan debit konstan 270 L/jam untuk keduanya, baik saat bekerja bersamaan maupun bergantian. Pada mode pengosongan otomatis, debit rata-rata tercatat 582 L/h. Sebaliknya, pada mode manual, debit mencapai 635 L/h pada volume 12 L, namun menurun hingga 221 L/h saat volume tinggal 1 L. Hal ini menunjukkan bahwa kontrol otomatis menghasilkan performa pompa yang lebih efisien dan stabil karena debit air tidak dipengaruhi oleh perubahan volume.

Kata Kunci : *Programmable Logic Controller* (PLC), Debit, Air, Pompa

ABSTRACT

DESIGN AND CONSTRUCTION OF A WATER CONTROL SYSTEM IN A RESERVOIR BASED ON A PROGRAMABLE LOGIC CONTROLLER (PLC)

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Flooding problems due to excess water require a Programmable Logic Controller (PLC)-based control system capable of managing the water filling and emptying process automatically. This study designed and tested a water reservoir control system with two DC pumps, and measured the parameters of voltage, current, power, and water discharge. The results show that DC Pump 1 operates at 23.9 V, 1.98 A, and 45.8 W, while DC Pump 2 operates at 23.9 V, 1.79 A, and 42.7 W, with a constant discharge of 270 L/h for both, both when working simultaneously and alternately. In automatic emptying mode, the average discharge was recorded at 582 L/h. Conversely, in manual mode, the discharge reached 635 L/h at a volume of 12 L, but decreased to 221 L/h when the volume was 1 L. This indicates that automatic control produces more efficient and stable pump performance because the water discharge is not affected by changes in volume.

Keywords: Programmable Logic Controller (PLC), Water, Flow, Pump