

## INTISARI

Saat ini sebagian peralatan di laboratorium masih menggunakan pengisian secara manual. Maka dibuatlah conveyor pengisian bejana dilaboratorium secara otomatis. Sebelumnya telah dirancang conveyor menggunakan sistem kontrol on-off tetapi masih terdapat kekurangan pada proses pengisian belum sesuai dengan yang diharapkan. Dirancang conveyor pengisi bejana menggunakan sistem control PID. Dengan menggunakan sistem control PID proses pengisian larutan dalam bejana diperoleh hasil pengisian secara tepat, teliti, dan aman.

Konveyor pengisian bejana semi-otomatis dirancang menggunakan program AUTODESK INVENTOR 2016. Proses pembuatan mesin conveyor melalui beberapa proses menyiapkan bahan, proses pemotongan bahan, proses pengelasan, pemasangan kerangka, pemasangan komponen, dan pembuatan rangkaian kelistrikan. Pada alat ini terpasang beberapa komponen utama antara lain : sensor ultrasonik, Arduino UNO, sensor flowmeter, selenoid valve, belt conveyor, roller, pompa, motor DC, relay, dan gearbox. Semua komponen tersebut akan di pasang dalam rangka yang menggunakan bahan besi siku, canal CNP, dan akrilik dengan tebal 5 mm.

Konveyor pengisi bejana dapat mengangkat beberapa bejana secara berurutan. Setiap bejana mempunyai kapasitas cairan maksimal sebesar 500 ml. Alat pengisi bejana memiliki dimensi panjang 100 cm, lebar 30 cm, dan tinggi 40 cm. Hasil pengujian kerja alat pengisi bejana pada proses pengisian larutan, pada percobaan 1 diperoleh rata-rata 443,33 ml dalam waktu 61,29 detik, percobaan 2 diperoleh rata-rata 443,33 ml dalam waktu 62,4 detik, dan percobaan 3 diperoleh rata-rata 443,33 ml dalam waktu 61,7 detik.

Kata kunci : sistem kontrol PID, Arduino UNO , sensor ultrasonic, sensor flowmeter, Autodesk Inventor 2016,.

### **Abstract**

Currently some of the equipment in the laboratory is still using manual charging. Then a conveyor filling vessel was made in the laboratory automatically. Previously the conveyor was designed to use an on-off control system but there were still shortcomings in the filling process which was not as expected. Designed vessel filler conveyor using PID control system. By using the PID control system the process of filling the solution in a vessel is obtained by filling results precisely, thoroughly, and safely. Semi automatic vessel filling conveyors are designed using the 2016 AUTODESK INVENTOR program. The process of making conveyor machines goes through several processes of preparing materials, cutting processes of materials, welding processes, mounting frames, mounting components, and making electrical circuits. In this tool installed several main components including: ultrasonic sensors, Arduino UNO, flowmeter sensors, solenoid valve, conveyor belts, rollers, pumps, DC motors, relays, and gearboxes. All components will be installed in a framework that uses angled iron, CNP canal, and acrylic with a thickness of 5 mm. The vessel filler conveyor can transport several vessels in sequence. Each vessel has a maximum liquid capacity of 500 ml. Bejan filler has dimensions of length 100 cm, width 30 cm and height 40 cm. The results of testing the work of the vessel filler in the process of filling the solution, in experiment 1 obtained an average of 443.33 ml in 61.29 seconds, experiment 2 obtained an average of 443.33 ml in 62.4 seconds, and experiment 3 was obtained an average of 443.33 ml in 61.7 second.

**Keywords :** PID control system, Arduino UNO, ultrasonic sensor, flowmeter sensor, Autodesk Inventor 2016