

## ABSTRAK

*Syringe pump tergolong sebagai alat kesehatan yang digunakan untuk memasukkan cairan obat tertentu ke dalam tubuh pasien dengan jangka waktu yang telah ditentukan. Prinsip kerja alat syringe pump itu adalah menyalurkan obat dari spuit ukuran tertentu ke tubuh pasien yang dialirkan secara berkala yang digerakkan langsung oleh motor stepper. Masalah yang sering muncul saat penggunaan syringe pump yaitu terjadinya sumbatan saat proses pompanya terjadi. Hal ini disebabkan oleh beberapa faktor, seperti kemungkinan darah pasien mudah menggumpal, selang yang bisa terjepit, serta pengendapan darah di jarum saat dimasukkan ke pembuluh darah pasien. Melalui tugas akhir ini, tim melakukan perancangan sebuah alat Rancang Bangun Syringe Pump Dilengkapi Sistem Occlusion dan Nearly Empty Dengan Pemilihan Spuit Otomatis. Sebagai solusi dari permasalahan tersebut. Alat ini bisa mendeteksi oklusi dengan menggunakan sensor FSR 402 sebagai deteksi oklusi, arduino uno sebagai mikrokontroler, serta LCD nextion sebagai display. Dari pengukuran parameter oklusi yang telah dilakukan, dengan tekanan 10 Psi dan dengan setting flowrate 10, 20, 30, 40, dan 50 ml/jam, pada spuit ukuran 10 ml didapati error terbesar pada flowrate 20ml/jam yaitu sebesar 1,68%, pada spuit 20 ditemukan error terbesar pada flowrate 50ml/jam sebesar 4,5%, dan pada spuit 50ml didapati error terbesar pada setting flowrate 40ml/jam 3,55%. Dan pada pengukuran flowrate pada spuit 10ml didapat error terbesar pada setting flowrate 30ml/jam yaitu sebesar 1,71%, error terendah pada setting flowrate 10ml/jam sebesar 0,46%, pada spuit 20ml diperoleh error terbesar pada setting flowrate 30ml/jam sebesar 0,47%, error terendah pada setting flowrate 40ml/jam sebesar 0,05%, dan pada spuit 50ml diperoleh error terbesar pada setting flowrate 10ml/jam sebesar 1,73%, error terendah pada setting flowrate 30ml/jam sebesar 0,36%.*

---

**Kata Kunci:** *Syringe pump, FSR-402, oklusi, arduino uno*

## ABSTRACT

*Syringe pump is one of the medical devices that functions to insert liquid drugs into the patient's body for a certain period of time periodically. The working principle of the syringe pump is to distribute drugs from a certain size syringe to the patient's body which is periodically flowed which is driven directly by a stepper motor. A problem that often arises when using a syringe pump is occlusion (blockage) during the pump mechanism. Occlusion is influenced by the nature of the patient's blood, namely easy coagulation (clots), pinched hoses, and blood clots in the needle to the patient's blood vessels. Through this final project, the team designed a Syringe Pump Design Tool Equipped with Occlusion and Nearly Empty Systems with Automatic Syringe Selection. As a solution to this problem. This tool can detect occlusion by using the FSR 402 sensor as occlusion detection, arduino uno as a microcontroller, and nextion LCD as a display. From the measurement of occlusion parameters that have been carried out, with a pressure of 10 Psi and with a flowrate setting of 10, 20, 30, 40, and 50 ml/hour, on a 10 ml syringe it was found that the largest error was found at the flowrate of 20 ml/hour which was 1.68%, in the 20 syringe the largest error was found at the flowrate of 50ml/hour of 4.5%, and in the 50ml syringe the largest error was found at the flowrate setting of 40ml/hour of 3.55%. And in the measurement of flowrate in a 10ml syringe, the largest error was obtained at the 30ml/hour flowrate setting, which was 1.71%, the lowest error was obtained at the 10ml/hour flowrate setting of 0.46%, in the 20ml syringe, the largest error was obtained at the 30ml/hour flowrate setting of 0.47%, the lowest error was obtained at the 40ml/hour flowrate setting of 0.05%, and in the 50ml syringe, the largest error was obtained at the 10ml/hour flowrate setting of 1.73%, The lowest error was at the 30ml/hour flowrate setting of 0.36%.*

---

**Keywords:** *Syringe pump, FSR-402, occlusion, arduino uno*