

ABSTRACT

The implementation of the artificial respiration system is proven to be able to help human life, especially in the health sector. One of the artificial respiration devices in the medical world is a ventilator. The need for ventilators has increased, especially during the COVID-19 pandemic. However, the availability of ventilators is not commensurate with the increasing demand. Ventilators function to help or replace normal respiratory function in people who have respiratory problems.

One of the most important organs in the human respiratory system is the lungs. The lungs can expand when there is a transfer of volume of air from the atmosphere to the lungs. On the other hand, the lungs can collapse when there is a displacement of the volume of air from the lungs to the atmosphere. In people who have respiratory problems, the flow of air in and out is not as expected by the patient's body. Because of this, the volume of air flowing into the lungs must be controlled. In this final project, the ventilator made can help or replace normal respiratory function in people who have respiratory problems based on volume transfer. This can be engineered by providing a certain volume of air so that air enters the lungs. Instead draw a volume of air so that air out of the lungs. The provision of a certain volume of air is obtained from the airflow drive. Flow drive speed to control how fast the airflow reaches the desired target. Based on this, one of the control methods that can be used is Fuzzy Logic.

At the end of this study, the ventilator made can control the volume at 3 desired values. The use of fuzzy logic is able to make ventilators with volume settings of 470 mL, 500 mL and 550 mL with an accuracy rate of 95-99%.

Keyword: ventilator, air volume control, fuzzy logic