

## ABSTRACT

Incinerator is a waste processing machine using high temperature combustion method which is produced by distributing pressurized gas as a result of heating the water tube in the combustion chamber. The operation of an incinerator engine requires a stable and constant water supply because it will have an impact on combustion temperatures where high temperatures are needed to produce complete combustion. Therefore, the use of incinerators for operators needs to be monitored at the fuel water supply level, the level of compounds in combustion smoke and the temperature in the combustion chamber. The safety impact of operating the machine if it is from a close distance will be dangerous for the operator who operates it.

With these problems in mind, we have developed a remote monitoring and control system for incinerator machines with specifications that have been adjusted to the needs of incinerator machine operators. This system will allow the use of incinerators to be monitored with variable combustion temperatures, fuel water levels, and Content of  $CO$ ,  $CO_2$ ,  $NH_4$  and  $H_2S$  in the smoke from the combustion of the incinerator engine. After conducting research on the development of monitoring and remote control systems on incinerator machines, the results of the test data are obtained:

- The ultrasonic sensor works according to specifications to maintain a stable fuel supply with a solenoid actuator that distributes fuel when the water level is  $<40\%$ , the solenoid will turn on and pump water until the monitored water level is  $>85\%$ , the solenoid will stop distributing water.
- Testing of the MQ - 135, MQ - 7, and MQ - 136 sensors proved that  $CO_2$  pollution levels were monitored,  $CO_2$ ,  $NH_4$  and  $H_2S$  with the results of an average value of  $CO$  2,669 mg/m<sup>3</sup>,  $CO_2$  907.925mg/m<sup>3</sup>,  $H_2S$  13,981mg/m<sup>3</sup>,  $NH_4$  504,4 mg/m<sup>3</sup>
- Testing of the type K thermocouple sensor works according to specifications to monitor the temperature in the combustion chamber when the incinerator burns waste. And it was found that burning waste by an incinerator can produce combustion temperatures in the range of  $400^{\circ}C - 1200^{\circ}C$ .

Therefore, the system we have developed makes the use of the incinerator engine that has been implemented by our system more efficient and effective in terms of optimal combustion and safety for the operator who is responsible for operating the incinerator machine.

Keywords: Incinerator, engine, monitored, water level, temperature, content of chemical