ABSTRACT

Nowadays, the energy consumption is still depending on fossil energy, whereas the availability of fossil energy on earth is limited and causes air pollution occured in various area in the world, therefore the alternative energy must be supported in order to replace the fossil energy. The alternative energy reviewed in this final project is biogas, because biogas is economical and environment friendly. However, the application of biogas hasn't manucfactured by right measuring instruments.

In this final project, an instrument is made for measuring biogas volume in biogas reactors. The volumetric gas meter designed by using piezoresistive pressure censor, while the reactor is designed tube shaped using PVC material which have 3 Liter volume maximum capacity, radius 5.25 cm , and 35 cm high. The reactor has been tested by previous researchers, then for accommodating gas from the reactor, a gas storage bag is used that placed in the acrylic container which size is 20 cm long, 10 cm wide and 20 cm high.

Output of the sensor is in the value of the ADC (Analog to Digital Converter) will be processed on an Arduino microcontroller and the volume of gas will be converted into units of milliliters (mL), the data will be recorded on a micro SD (SD card) in real time. The test results stated that volumetric gas meter has an 98,94 % in accuracy, 93,36 % in precision, range from 0 mL to 600 mL, the sensitivity 5mV/11,36 mL and the average measurement uncertainty of ± 8.22 mL.

Keyword : Piezoresistive, Biogas, Instrument, Volume, Arduino.