

## ABSTRACT

### DESIGN OF AUTOMATIC EGG POULTRY INCUBATOR WITH TWO SOURCES OF LOAD SUPPLY PLN AND SOLAR CELLS

By

Kornelius Pranoto Adi

Eggs hatching is very important to increase poultry production. The number of eggs that can be hatched by the poultry are relatively little. Each type of eggs poultry require different temperature and humidity. Egg incubator is a tool used to hatching the eggs in rather large amount by controlling the temperature at a specific value. But generally, the egg incubator can hatching the only one kind of eggs, not monitored temperature and humidity, can not work when the electricity off and many involve human. In this study designed a system of poultry egg incubator with temperature and humidity control automatically that can be monitored by computer and using solar cells to backup energy source. The keypad is used to set the temperature and humidity in accordance with the needs, so the incubator can be used for all kinds of poultry eggs hatching. Control of temperature and humidity using Atmega 2560 microcontroller with swiching on / off method on the DC lamps as heater and cooling DC fan. Monitoring of temperature and humidity on the computer using LabVIEW software and the incubator using 16x2 LCD. Egg rack rotates automatically every 3 hours at 06:00 at  $-40^{\circ}$  angle and at 09:00 at  $40^{\circ}$  angle with the servo motor as the driving force. The temperature sensor used LM35 and used DHT11 as humidity sensor. In this study used chicken eggs and duck as an object. Chicken and duck eggs require  $38^{\circ}\text{C} - 40^{\circ}\text{C}$  of temperatures, relative humidity of 55% – 65% on duck eggs and 50% - 60% in chicken eggs. System test results obtained by  $39.13^{\circ}\text{C}$  temperature stability and humidity of 59.54% on hatching duck eggs, temperature and humidity of  $39.24^{\circ}\text{C}$  and 51.54% in chicken eggs. Monitoring temperature and humidity incubator can be done in real time using the LabVIEW software and data can be stored in the form of Microsoft Excel. With automatic swiching method, the solar cell can be a source of energy incubator when electricity off.

**Keywords:** Egg Incubator, Control, Temperature, Humidity, Hybrid Systems, Microcontroller