

Monitoring of The Charcoal Furnace Control System of Coconut Shell Waste Treatment Becoming Charcoal With ATmega 328P Microcontroller

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Abstract – Coconut plants is the one of potential commodities that are classified as strategic hard/annual plantation commodity. Demand of the coconut plants tend to increase each time along with development of science and technology that increase rapidly these days, especially in the computerized technology field that is real with the existing of computer device which is working automatically then will be designed with integrated control using microcontroller.

The testing result on the control system of the charcoal furnace indicates that the system works by the design. Testing control of servo motor to setting up the size of flame on the gas stove set by servo motor to open/close the regulator on LPG gas.

The testing on the charcoal furnace control Thermocouple Type K signal sensor detects temperature on the charcoal furnace during the combustion of the coconut shell then processing by microcontroller and will be displayed on LCD and monitoring on PC with LabView application program.

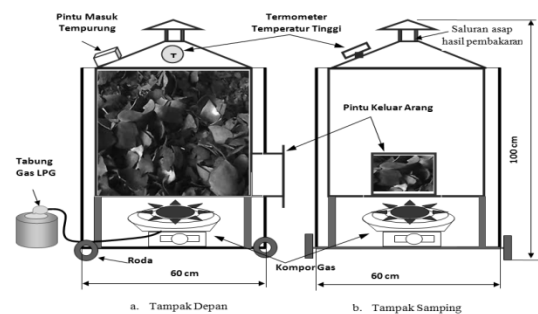
Testing process with the coconut shell that burned in the charcoal furnace for 23 kg produce charcoal for 8.75 kg, meanwhile the room temperature average during the testing process is 30.46°C and the maximum temperature of charcoal furnace is 215°C.

Keywords: Charcoal Furnace, Microcontroller, servo motor, Thermocouple Sensor and PC.

A. Draft Research Model

Design of control system monitoring covers: prototype design of charcoal furnace, software and hardware. Design system will forming a control system of temperature and servomotor. The controlling is done by controlling the size of temperature and regulator on the LPG tube.

The prototype that will be made is the prototype from monitoring control system for charcoal furnace. The prototype that will be made as the picture 1.



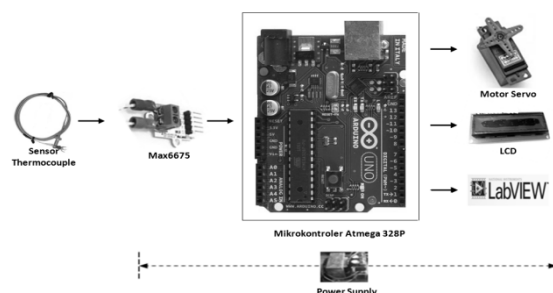
Pic.1: Design prototype of Charcoal Furnace

B. Diagram System Block

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Note:

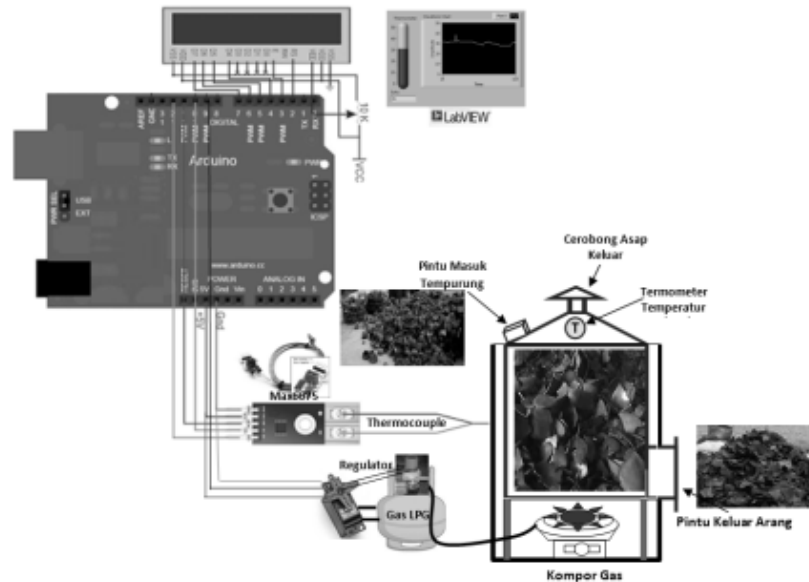
1. The power supply to supply Input / Output equipment and control device of microcontroller Atmega 328P with the voltage 5 Vdc.
2. Thermocouple sensor and driver Max6675 as



Pic. 2: Diagram Block of Greenhouse System

- the microcontroller input to detect temperature in the charcoal furnace.
3. Microcontroller Atmega 328P as control centre of the charcoal furnace control system receive the signal that has given, processed then the output to display LCD, PC Monitoring with LabView.
 4. Servo motor as the flame control of gas stove by adjust regulator on the LPG gas tube.
 5. The LCD as output display of temperature signal.
Laptop / Desktop use for system monitoring with LabView.

C. Control System Draft of Charcoal Furnace with LCD and LabView



Pic.3: Monitoring of Charcoal Furnace Control System

On picture 3, Thermocouple sensor signal Type K will detect the temperature on the Charcoal Furnace when the combustion of coconut shell will be processed by microcontroller then will be displayed on LCD and monitoring on PC with the LabView application program.

The size of flame on the gas stove adjust by servo motor to open/close the regulator on LPG gas.

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