# SOLAR POWER BASED INDUSTRIAL BOILER CONTROLLER WITH TEMPERATURE DISPLAY

## ABSTRACT

This project is an industrial boiler controller that controls the temperature of the heating element of a device according to its requirement. The system uses solar power as the power supply. Thus, the project saves the electrical power upto the maximum extent.

The sensed and set temperature values are simultaneously displayed on the LCD panel. The circuit is programmed for on/ off control. It is very compact using few components and can be implemented for several applications including air-conditioners, water-heaters, snow-melting equipments, ovens, heat-exchangers, mixers, furnaces, incubators, thermal baths and veterinary operating tables.

The temperature sensor LM35 senses the temperature and converts it into an electrical signal, which is applied to the microcontroller through ADC. The analog signal is converted into digital format by the analog-to-digital converter (ADC). The sensed and set values of the temperature are displayed on the 16x2-line LCD. The set temperature value can be varied from 1C to 255C using an external PCB mount push on switch.

**The main features of the project are:**

1. Usage of solar energy for boiler.
2. Displaying of sensed and set temperature on LCD display.
3. Possible to vary set temperature.
4. Alerts if sensed temperature exceeds set temperature.

**The project provides learning's of following technologies:**

1. Temperature sensor.
2. ADC usage of Microcontroller.
3. LCD interfacing to Microcontroller.
4. Solar panel.
5. Voltage measuring circuit.

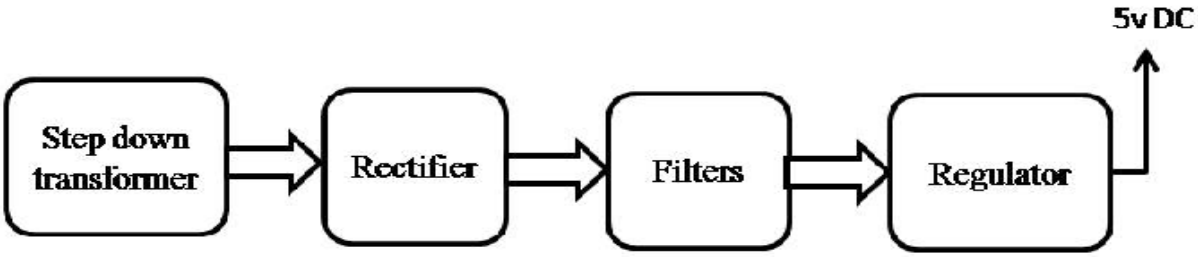
**The major building blocks of the project are:**

1. Regulated Power Supply.
2. PIC Microcontroller.
3. Temperature sensor.
4. Crystal oscillator.
5. LED indicators.
6. Reset.
7. Buzzer.
8. POT
9. LCD display with driver.

**Software's used:**

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

**Regulated Power Supply:**




**Block Diagram**