

## Experiment #9

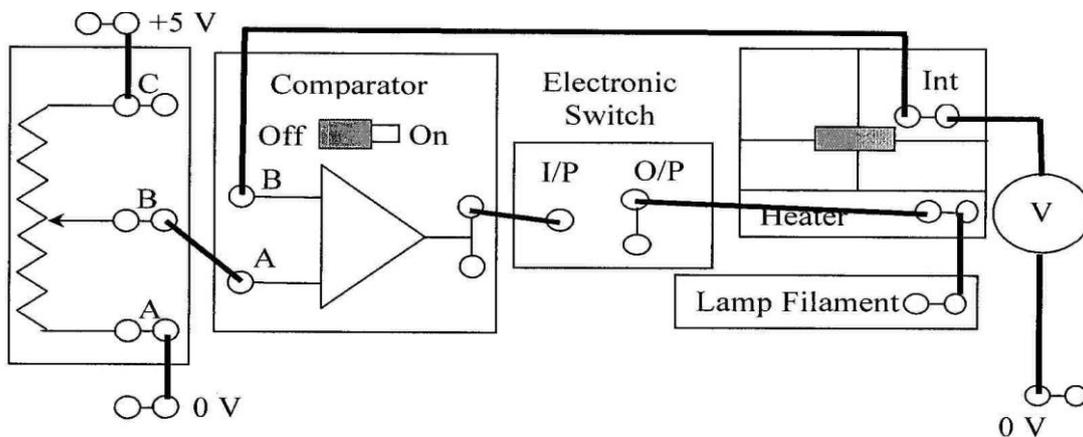
### Characteristics of an ON-OFF Temperature Control System

#### 1. Preliminary Work

- 1.1 Give a brief description of ON-OFF control action
- 1.2 Give names and brief descriptions of three temperature sensing devices used in industry.
- 1.3 Define "differential gap" that occurs in ON-OFF systems.

Do not forget to include a list of your references!

#### 2. Set up the circuit below.



2.1. First, adjust the voltage at input B of the var. Resistor to 3.2 volts while the heater is disconnected from the circuit. This corresponds to 320 K. Connect a multimeter to internal output of the IC temperature sensor. Turn the set off and reconnect the circuit.

2.2. set your timer to 0 seconds. Start the timer as soon as you turn the set on. Record the multimeter reading, position of solenoid, and state of the lamp at every minute. Record the times at which the components change, as well. Continue recording until the multimeter reading completes three cycles.

#### 3. Result and Conclusions

3.1. using the data collected, sketch the temperature versus time on a graph paper. On the sketch, indicate all the critical points and intervals.

3.2. measure the time

Intervals during which the system is on and off. Is it possible and desirable to make these intervals wider or narrower? How ?

3.3. measure the gap between the maximum and minimum temperature values during the cycles. What do we call this gap? Is it possible to increase or decrease this gap? How? Discuss the advantages disadvantages of a too narrow and a too wide differential gap.