# De-Icing Temperature Control system :- (7)

Objective :-

- to investigates one of many new methods which may be suitable for deicing the lifting surfaces of commerical aircraft. the approach utilizes the hot engine exhaust gas to melt ice. since the exhaust is too hot to apply constantly to the aircraft surfaces, a system which controls flow is investigated in the experiment.

- The wing was modeled using a small piece of sheet metal roughly 15mm wide by 30mm long.

- A Thermocouple was mounted to the sheet metal 'wing' to monitor temperature.

- An electric hair dryer was used to model the hot engine exhaust airstream and aimed at the wing in the vicinity of the thermocouple.

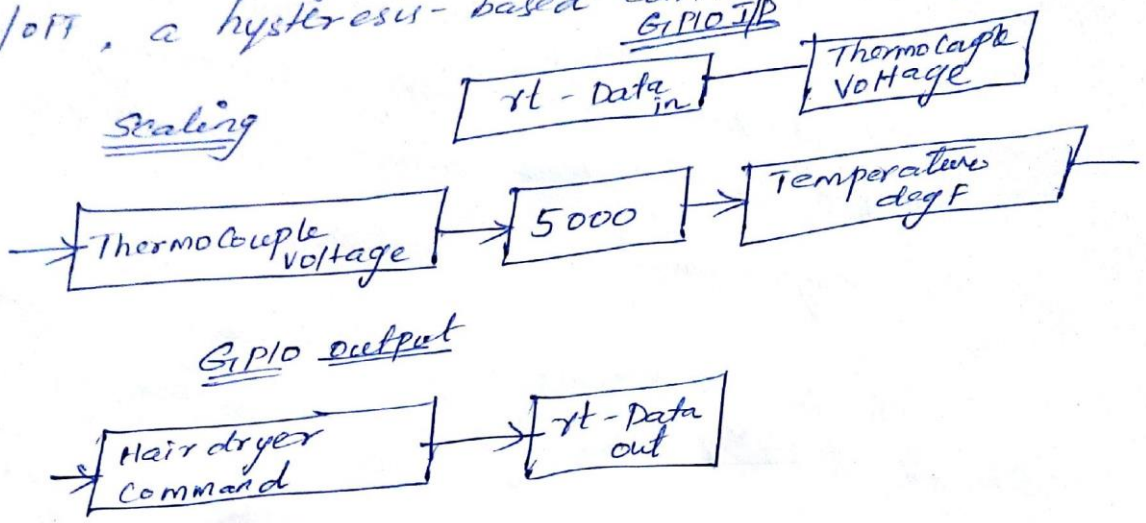
- power to the hair dryer was controlled by an ON/OFF switching circuit.

Ports :-

- DC power supply
- Thermocouple sensor
- 12V electric hair dryer
- wiring & mounting of sheet metal

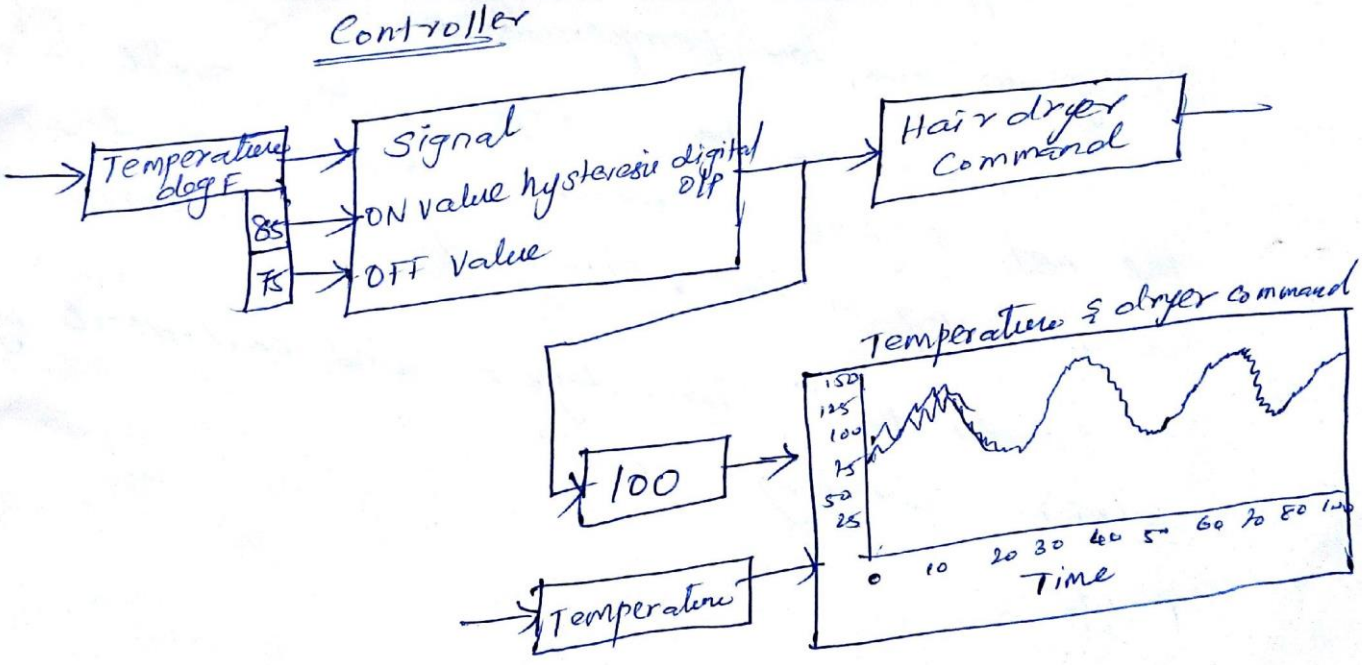
Experiment:-

- The transistor switch needed to turn the hair dryer ON/OFF.
- The voltage from the GPIO card is sent to a transistor sensor that switches 12V DC to the relay.
- since the hair dryer could be in either of two states ON/OFF, a hysteresis-based controller is implemented.





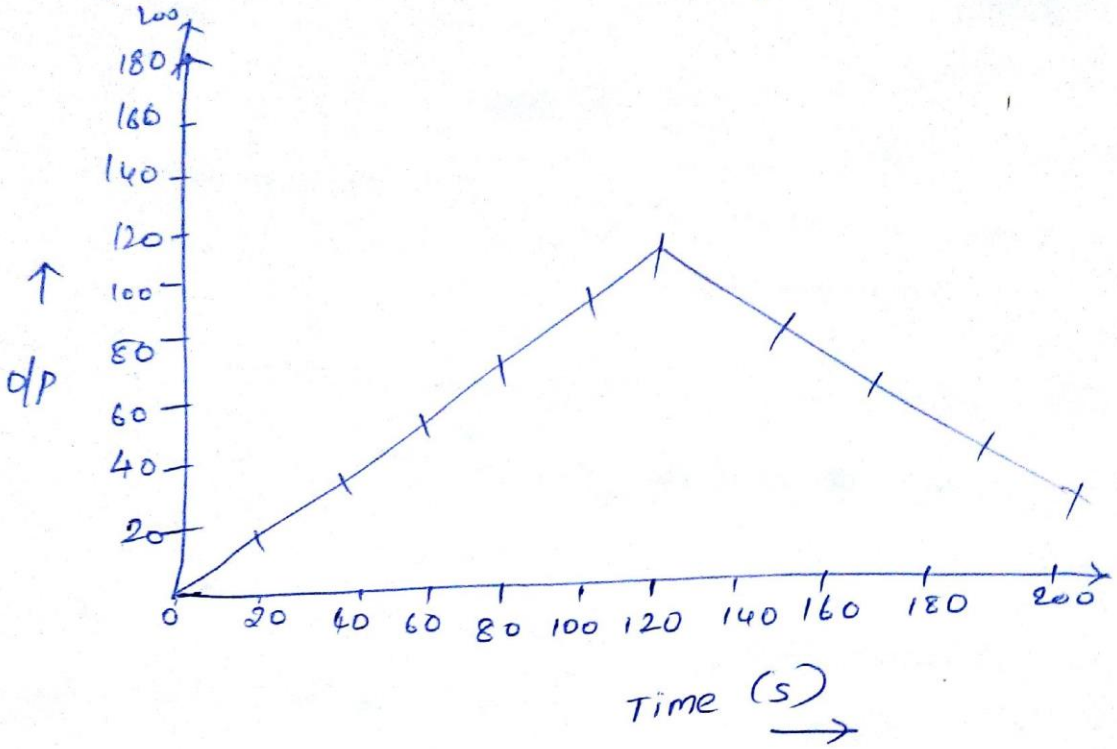





- hysterious controller is applied
- In this, the i/p signal is the wing temperature, the ON value is set to 24°c and the OFF value is set to 29°c.

- The controller incorporate the following logic to turn the digital o/p ON/OFF (1/0).

- The o/p is ON if the (i/p > ON value OR the past o/p is ON) AND the i/p > OFF value, otherwise the o/p is OFF.




- ON value = 85, OFF value = 75, & apply a positive sloped i/p ramp signal to i/p. until the i/p reaches the ON value (85), the o/p stays OFF.

- when the i/p exceeds the ON value the o/p turns ON. The first condition to be executed is I/P > ON value goes to false (0), however the o/p PV signal remains ON because the o/p was initially ON.

- when the i/p falls below the OFF value the o/p finally turns OFF.