

## Design choices

### • Power Supply.

We will be using normal 230V (AC) Benchtop supply.

We ~~used~~ will be using Full Wave Rectifier Module & Linear Regulator module to maintain a constant regulated 5V. DC. supply.

We choose LM 7805. as Linear Regulator.

High frequency filtering Capacitor are used to filter out the ripple component so as to get constant Magnitude supply as much as possible.

We will be using indications for ~~pro~~ denoting proper working of the Rectifier unit and the regulator unit. (LED's of different colours are used generally.)

### • Sensors

HPP 805A-031

Makes: TE Connectivity

(as per given).

(3 wired sensor probe)

## Comparator Block.

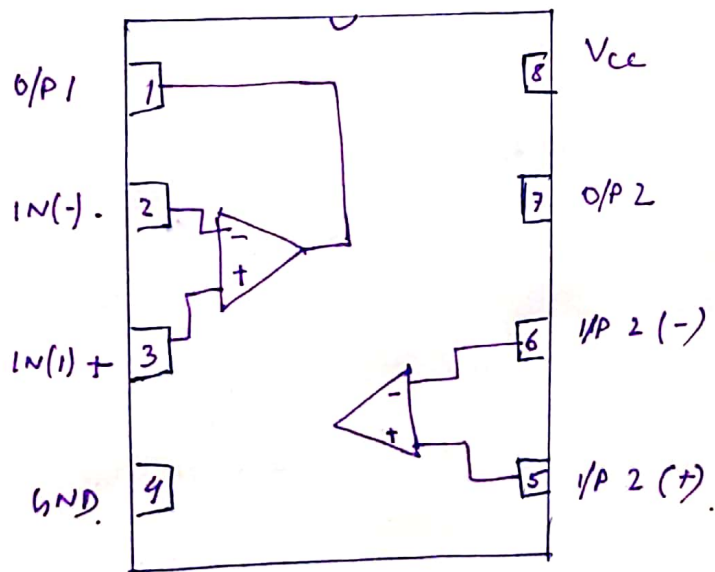
We need to keep the Relative humidity of the room within 30-60%.

We will be using two comparator blocks for the above.

We select (LM-358P) Comparator IC.

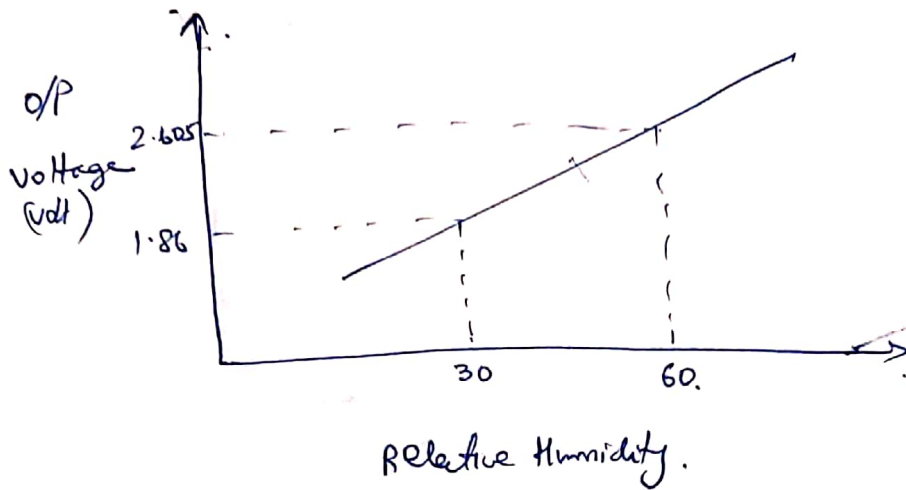
It has is a 8 pin IC.

It has two op amp comparators in built. Select of one single IC having two comparators blocks rather than selecting two different comparator IC will reduce the PCB dimension & circuit complexity.



Pin Config of  
LM 358P.

The humidity sensor. (TE connectivity Make) have a linear signal output of calibration scale.

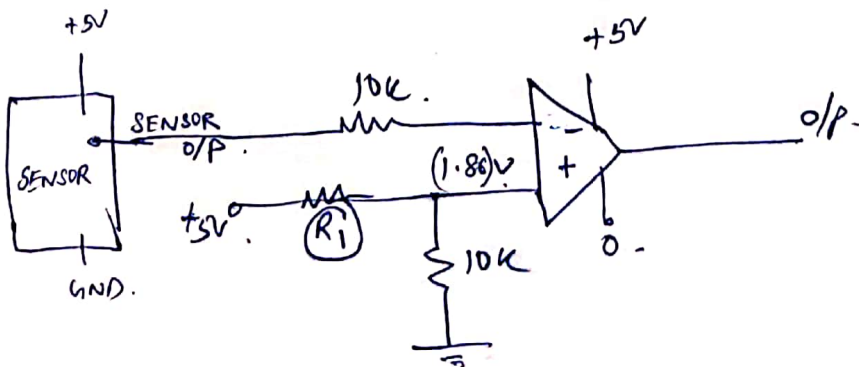


30% RH  $\rightarrow$  1.86 volt  
 60% RH  $\rightarrow$  2.605 volt

So if RH is  $< 30\%$   $\rightarrow$  Buzzes ON  
 if RH is  $> 60\%$   $\rightarrow$  Buzzes ON  
 30 - 60% RH  $\rightarrow$  Buzzes off

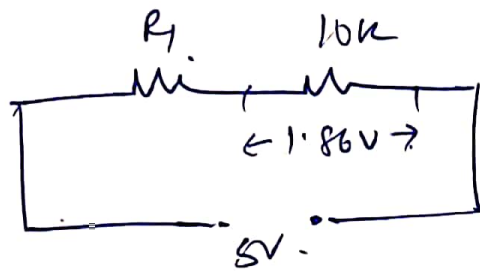
Comparators - Block Circuits

Comparator 1 (for  $< 30\%$  RH)



wee calculating  $R_2$ .

By voltage Div Rule



$$1.86 = 5 \times \frac{10k}{R_1 + 10k}$$

$$\Rightarrow R_1 \approx 1.7k$$

Comparator Block 2 of 4

Comparison Logic

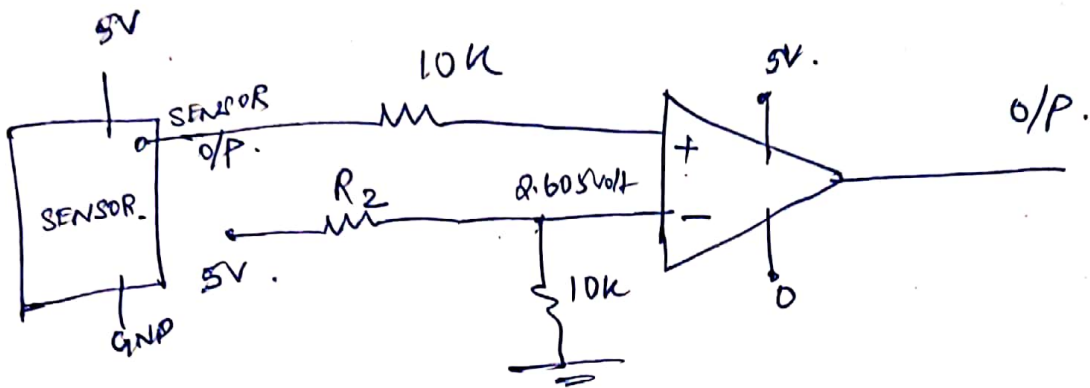
SENSOR o/P voltage  $<$   $1.86V$

$\Rightarrow$  OP Amp o/P =  $+V_{cc}$   
 $= 5V$

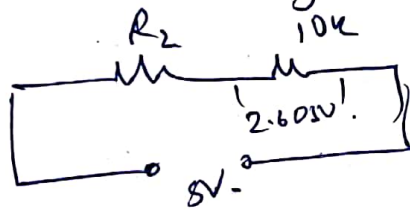
SENSOR o/P voltage  $>$   $1.86V$

$\Rightarrow$  OP amp o/P =  $0$

# Comparator 2 (for >60% RH)



Calculating  $R_2$ ,  
Any Voltage Division Rule.



$$2.605 = 5 \times \frac{10k}{10k + R_2}$$

$$\Rightarrow R_2 = 9k$$

## Comparison logic

Sensor o/p voltage  $> 2.605$  volt (60% RH)  
 $\Rightarrow$  op amp o/p high (5V)

Sensor o/p voltage  $< 2.605$  V (60% RH)  
 $\Rightarrow$  op amp o/p low (0)