



Measurement and
Instrumentation Laboratory
(EE3P005)

EXPERIMENT-7

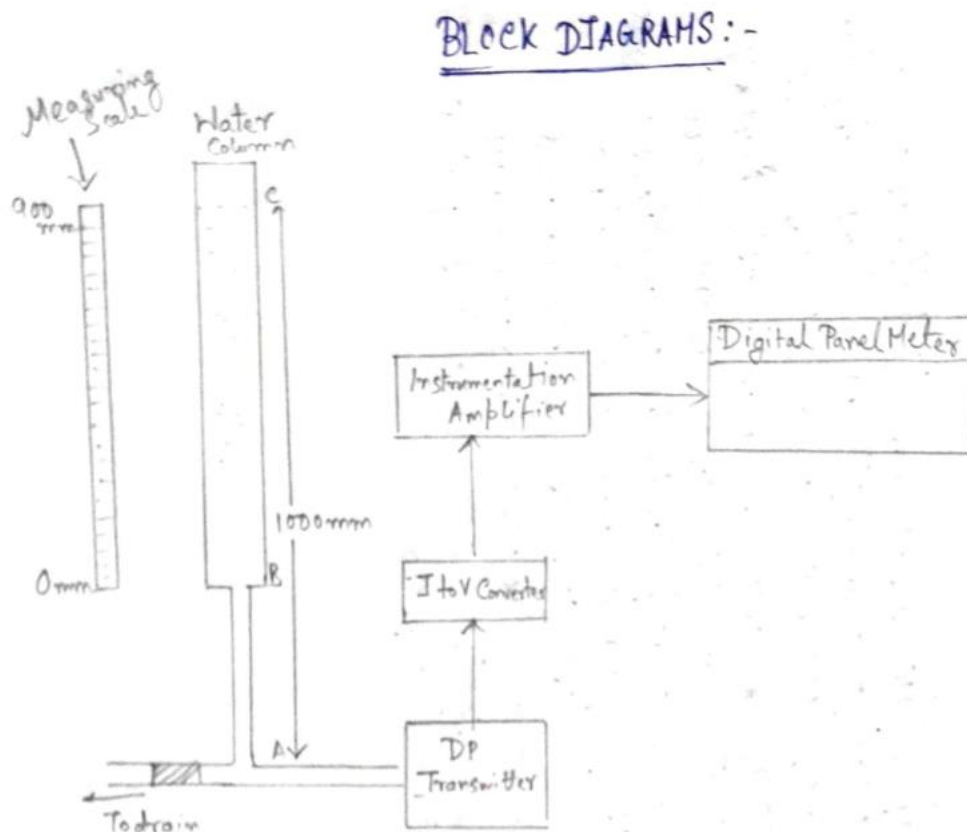
**Water Level Measurement using DP
Transmitter**

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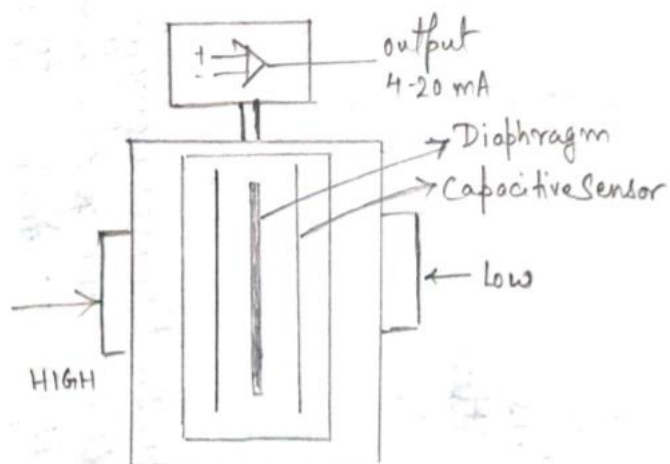
AIM OF THE EXPERIMENT:

To study the water level measurement using DP Transmitter.

CIRCUIT DIAGRAM:



DPT Diagram:-

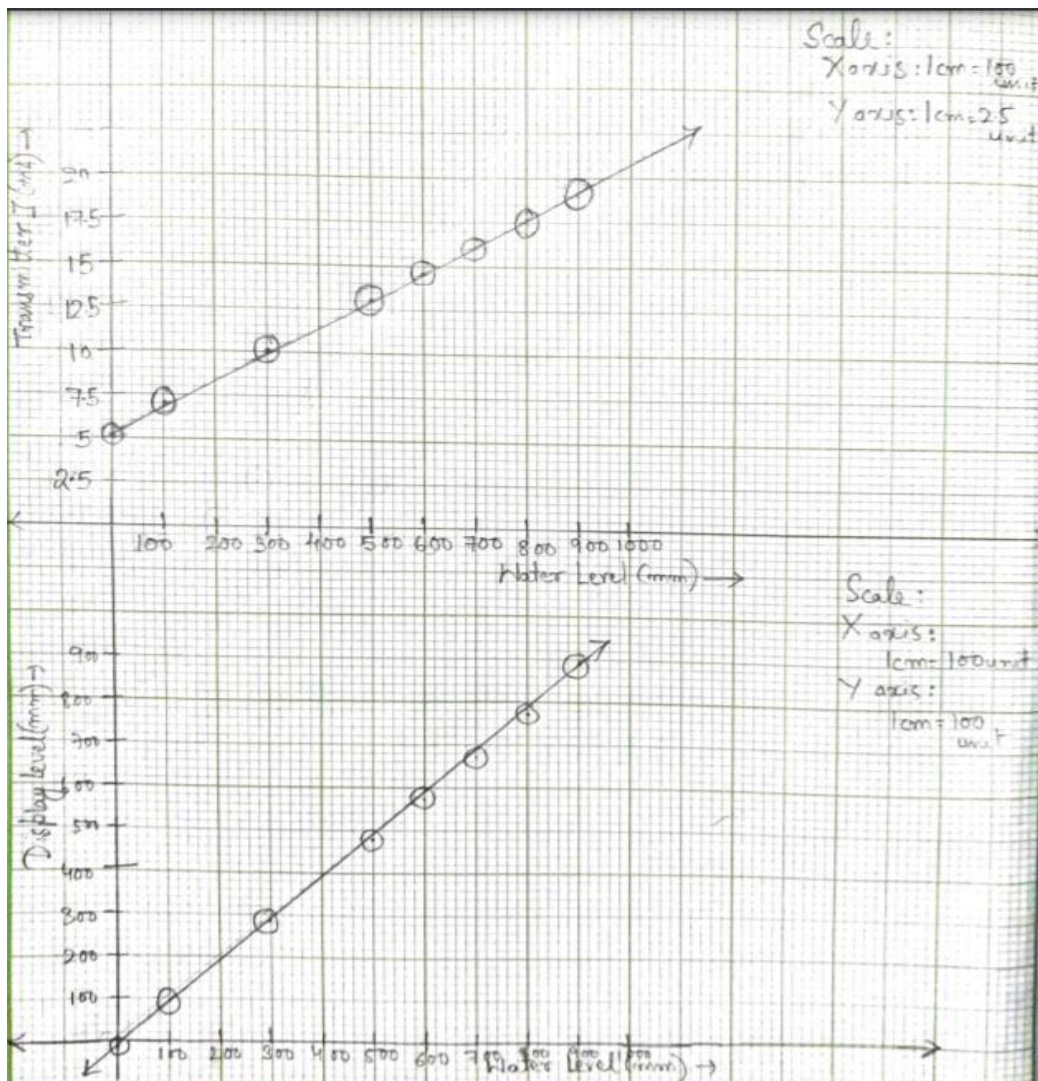


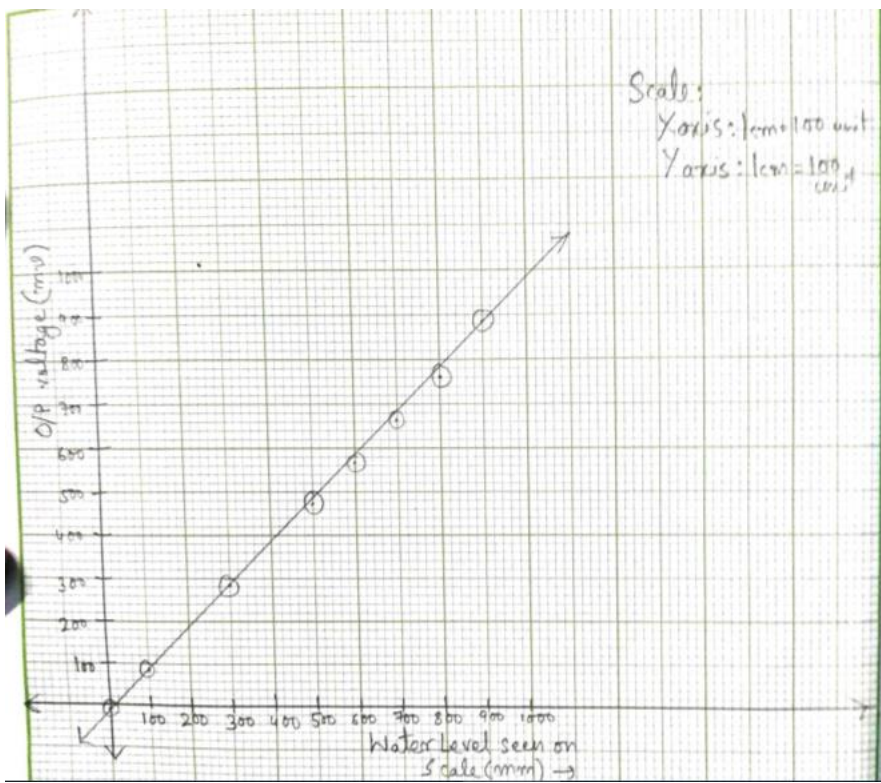
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OBSERVATION:

Water Level seen on Scale (mm)	Differential Pressure	O/P transmitter current (mA)	Display Level (mm)	O/P Voltage (mV)
900	1000	19	895	884
800	900	17.5	769	760
700	800	16	671	664
600	700	14.5	574	568
500	600	13	479	473
300	400	10	286	283
100	200	7	92	91
0	100	5	-04	-5

GRAPH:





CONCLUSIONS

Hence, the experiment video was seen and the theory was understood and the calculations and graphs were made from the data provided

DISCUSSION

1. Briefly describe operation of Differential Pressure Sensor?

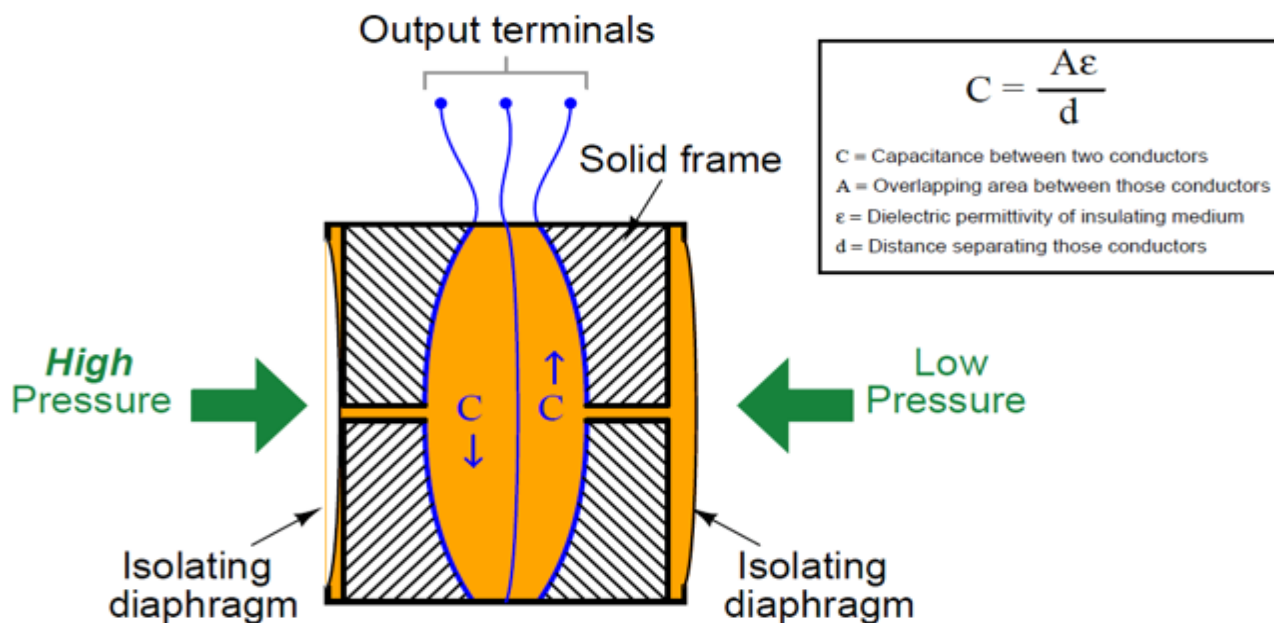
A. Differential pressure transmitter design works on the principle of differential capacitance. In this design, the sensing element is a taut metal diaphragm located equidistant between two stationary metal surfaces, comprising three plates for a complementary pair of capacitors.

An electrically insulating fill fluid (usually a liquid silicone compound) transfers motion from the isolating diaphragms to the sensing diaphragm, and also doubles as an effective dielectric for the two capacitors. Any difference of pressure across the cell causes the diaphragm to flex in the direction of least pressure. The sensing diaphragm is a precision-manufactured spring element, meaning that its displacement is a predictable function of applied force.

So, the diaphragm's secondary function as one plate of two capacitors provides a convenient method for measuring displacement.

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Since capacitance between conductors is inversely proportional to the distance separating them, capacitance on the low-pressure side will increase while capacitance on the high-pressure side will decrease.



2.The output of the Differential Pressure Sensor is current which is later converted to voltage. Why do you think the output from the sensor is current rather than voltage?

A. The change in capacitance can be measured easily using current (since capacitance changes with change in pressure). Hence, Output from the sensor is current rather than voltage.