



Class :4th stage

Subject: Control Lab.

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Control Laboratory

Experiment No. 2
Study of Air Flow Control

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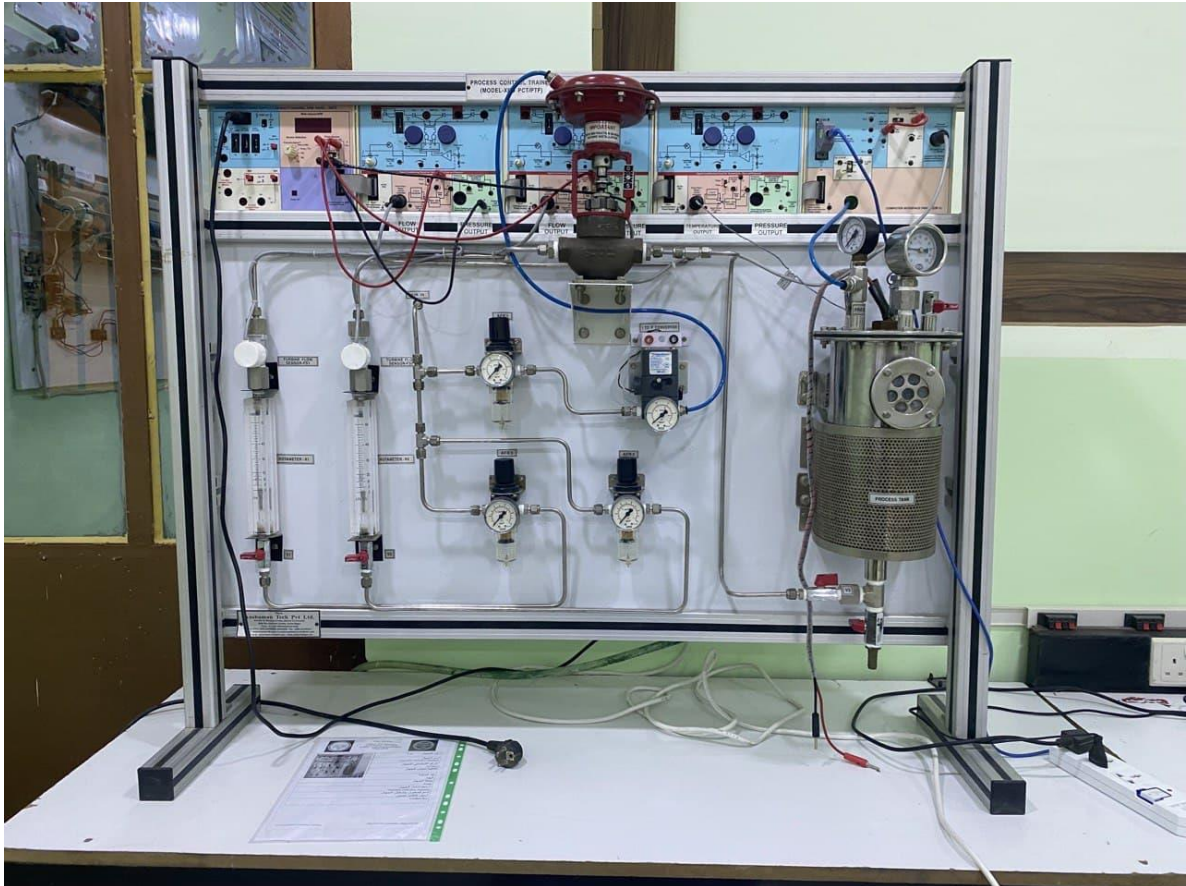
Number of Experiment: 2

Name of Experiment: Study of Air Flow Control

Purpose of Experiment: Learn how to control air flow by using flow sensor.

Equipment of Experiment: Process control trainer device which consist of:

1. Compressor.
2. Tank.
3. Heater.
4. Valves.
5. Rotameter.
6. Pressure gauge.
7. Converter.
8. Digital voltmeter.





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Theory of Experiment:

Every work environment requires an element of control when it comes to potential hazards. Whether you work in an office or a warehouse, there will always be some degree of risk to employees that has to be controlled efficiently.

In some environments, the hazards that pose risk to the employee are far more dangerous. Industries that work with ergonomic, chemical, physical and biological substances all involve the use of potentially harmful substances that can carry devastating consequences if badly managed. The need for the correct flow control equipment in these cases is essential.

Fluid Controls explains why the need for the correct flow control equipment in these cases is essential.

Most industries where the accurate delivery of gas or liquid to a chemical process, require flow control. Using a flow meter, the rate of flow is managed into a process using either a manual or servo-controlled proportional control valve. Flow controllers, which need modulating electronically to enable a closed process loop are installed to speed up and improve the processes whilst lowering the cost.

Applications that benefit from this include the sampling systems in petrochemical plants, gas and chemical control in manufacturing processes and in off-shore oil rigs.

Flow controllers within these environments are used as much to reduce the overall risk at its source, as they are to control the hazardous substance. The flow control equipment in use must be in compliance with stringent regulations and have the ability to operate safely.

Procedure:

1. For input output curve plotting keep V_1 , V_3 and V_5 fully open and V_2 , V_4 fully closed. (note V here means valve)
2. Connect the turbine flow sensor to signal conditioning panel EMT9 using 5-pin DIN male connector.
3. By keeping control valve fully open make the compressor ON.
4. Adjust AFR1 air pressure using knob on AFR1 about 1.4 bars seeing dial on pressure gauge.



- Now increase the flow of AFR2 from 0-50 every step 10 degree using knob on AFR2.
- Note down the output of tag 16 on EMT9 and DPM display. Fill the following table.

Reading No.	Rotameter reading	Voltage
1		
2		
3		
4		
5		

- Draw curve between voltage and rotameter reading.

Discussion:

- Why we have to control fluid flow?
- What is rotameter used for? Explain briefly.
- Explain how to control air flow in control process trainer.