



STANDARD OPERATING PROCEDURE

Name of the Lab./facility	Mechatronics
Purpose	To provide training for students and research scholars on various process control techniques by considering different parameters like flow, pressure, temperature and level using both experimental process control stations and real time parameters.
Scope	Experimental training on different process control technologies used to determine the operation and characteristics of various process control schemes such as flow process control, pressure process control, temperature process control and level process control. Experimental training on various process control stations to obtain P, PI and PID controller parameters and the real time operating characteristics of these controllers. Provision of Real time process control stations for experimental and research purposes
Responsibility	Faculty i/c of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE FOR CLOSED LOOP RESPONSE OF PRESSURE PROCESS CONTROL

- Before proceeding with the experiment, ensure the availability of air.
- Ensure the compressor is in ON mode
- The required set up and the connections to various parts of the station are to be followed as mentioned in the lab Manual.
- Interface the PC with process and data acquisition card.
- Maintain gauge (G1) pressure at 20 psi by using air regulator.
- Position the fluid valve HV1 slightly in open position.
- Before switching on the unit, the given connections should be verified by lab instructor.
- Switch ON the unit & data acquisition card with PC.

- Invoke process control software.
- Select "pressure <<control<<ON-OFF".
- Enter the parameters and drive the response of various controllers.
- Save response and conclude the behavior of pressure process
- After completing the experiment, ensure all the connections are discarded

PRECAUTIONS TO BE FOLLOWED

- The Hand valve HV1 should be opened slightly
- Maintain the input and output air regulator pressure values as mentioned in the manual
- PC and data acquisition card interfacing should be done properly.

RECORD TO BE MAINTAINED

- Laboratory Manual which contains the experiments that can be performed with the equipment
- Maintenance Record


Prepared by


Approved by


Principal



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Purpose	To provide training for students and research scholars on various process control techniques by considering different parameters like flow, pressure, temperature and level using both experimental process control stations and real time parameters.
Scope	Experimental training on different process control technologies used to determine the operation and characteristics of various process control schemes such as flow process control, pressure process control, temperature process control and level process control. Experimental training on various process control actions to obtain P, PI and PID controller parameters and the real time operating characteristics of these controllers. Provision of Real time process control stations for experimental and research purposes
Responsibility	Faculty i/c of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE FOR CLOSED LOOP RESPONSE OF PRESSURE PROCESS CONTROL

- The required set up and the connections to various parts of the station are to be followed as mentioned in the lab Manual.
- Interface the PC with process and data acquisition card.
- Before switching on the unit, the given connections should be verified by lab instructor.
- Switch ON the unit & data acquisition card with PC.
- Invoke process control software.
- Select "DC Motor Speed Control".
- Enter the parameters and drive the response for PID control.

- Save response and conclude the behavior of pressure process
- After completing the experiment, ensure all the connections are discarded

PRECAUTIONS TO BE FOLLOWED

- PC and data acquisition card interfacing should be done properly.
- Speed of the motor should be increased more than 1200rpm.

RECORD TO BE MAINTAINED

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Approved by


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VINAYAKA MISSION'S RESEARCH FOUNDATION
AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR



MECHATRONICS LABORATORY

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Scope	Experimental training on different process control technologies used to determine the operation and characteristics of various process control schemes such as flow process control, pressure process control, temperature process control and level process control. Experimental training on various process control stations to obtain P, PI and PID controller parameters and the real time operating characteristics of these controllers. Provision of Real time process control stations for experimental and research purposes
Responsibility	Faculty i/c of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE FOR CLOSED LOOP RESPONSE OF LEVEL PROCESS CONTROL

- Before proceeding with the experiment, ensure the adequate amount of water availability in the reservoir tank of flow process station.
- Ensure the compressor is in ON mode
- The required set up and the connections to various parts of the station are to be followed as mentioned in the lab Manual.
- Air pressure regulator input should be more than 25 psi and maintain the air regulator output pressure (G1) to 20 psi by varying the air regulator knob, which supplies constant pneumatic input to the electro-pneumatic converter.
- Keep the hand valve HV1, HV2 partially open.

- Invoke “level process “, software in PC.
- Select “control >>ON-OFF”
- Select “settings>>parameters” and enter values for each parameter.
- Before switching on the unit, the given connections should be verified by lab instructor.
- Switch ON the pump and to run the pump is desired speed by using variable speed control knob.
- Study the response of ON-OFF, control action for various value of set points
- Switch OFF the pump
- Save the response and conclude the behavior of various controllers
- After completing the experiment, ensure all the connections are discarded

PRECAUTIONS TO BE FOLLOWED

- Pump should not be switched off during the experiment
- The Hand valves HV1 and HV2 should be opened partially
- Maintain the input and output air regulator pressure values as mentioned in the manual

RECORD TO BE MAINTAINED

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MECHATRONICS LABORATORY

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Scope	Experimental training on different process control technologies used to determine the operation and characteristics of various process control schemes such as flow process control, pressure process control, temperature process control and level process control. Experimental training on various process control actions to obtain P, PI and PID controller parameters and the real time operating characteristics of these controllers. Provision of Real time process control stations for experimental and research purposes
Responsibility	Faculty i/c of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE FOR CLOSED LOOP RESPONSE OF PRESSURE PROCESS CONTROL

- Ensure the compressor is in ON mode
- Before proceeding with the experiment, ensure the availability of air pressure.
- The required set up and the connections to various parts of the station are to be followed as mentioned in the lab Manual.
- Interface the PC with process and data acquisition card.
- Maintain gauge (G1) pressure at 20 psi by using air regulator.
- Position the fluid valve HV1 slightly in open position.
- Before switching on the unit, the given connections should be verified by lab instructor.
- Switch ON the unit & data acquisition card with PC.

- Invoke process control software.
- Select “pressure <<control<<ON-OFF”.
- Enter the parameters and drive the response of various controllers.
- Save response and conclude the behavior of pressure process
- After completing the experiment, ensure all the connections are discarded

PRECAUTIONS TO BE FOLLOWED

- The Hand valve HV1 should be opened slightly
- Maintain the input and output air regulator pressure values as mentioned in the manual
- PC and data acquisition card interfacing should be done properly.

RECORD TO BE MAINTAINED

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VINAYAKA MISSION'S RESEARCH FOUNDATION
AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR



MECHATRONICS LABORATORY

STANDARD OPERATING PROCEDURE

Name of the Lab./facility	Mechatronics Lab
Purpose	To provide training for students and research scholars on various process control applications using Programmable Logic Controller.
Scope	Experimental training on Programmable Logic Controller and various applications used to determine the operation and characteristics of various process control actions. Experimental training on various process control systems such as DC motor speed control ,Traffic light control ,Electro Pneumatic system ,different types of sensor etc.. Provision of Real time process control applications for experimental and research purposes
Responsibility	Faculty i/c of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE FOR PROGRAMMABLE LOGIC CONTROLLER

- Before processing with the experiment , ensure the availability of water in the Reservoir tank
- The required set up and the connections to various sensors and actuators are to be followed as mentioned in the lab Manual.
- Interface the PC with process application and PLC.
- Load the Versapro Software to the PLC
- Open the Software
- Switch ON the PLC Trainer and Bottle filling system
- Connect PLC and Bottle Filling System Kit
- Open the new folder and draw the Ladder Logic program
- Connect the PLC to PC
- Select the correct hardware Configuration

- Store the program to PLC.
- Run the Program
- Verify the performance of the Bottle Filling System
- After completing the experiment, ensure all the connections are discarded

PRECAUTIONS TO BE FOLLOWED

- Check the availability of water in the reservoir tank
- Check the availability of bottles in position

RECORD TO BE MAINTAINED

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Prepared by

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Approved by

R. D. S.
Principal



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Responsibility	Faculty i/c of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE FOR CLOSED LOOP RESPONSE OF TEMPERATURE PROCESS CONTROL

- Before proceeding with the experiment, ensure the adequate amount of water availability in the tank of flow process station.
- Ensure the compressor is in ON mode
- The required set up and the connections to various parts of the station are to be followed as mentioned in the lab Manual.
- Interface the PC with process and data acquisition card.
- Connect the pump plug and heater plug to the respective sockets provided at the back panel.
- Connect the sensor terminals and level switch terminals to that respective connectors provided at the back panel.

- Keep the switch 'S2' in the left position.
- Patch R1, R2,A1,A2,B1,B2 using patch chords.
- Before switching on the unit, the given connections should be verified by lab instructor.
- Switch ON the pump.
- Set rotameter at some minimum flow rate
- Select. "Temp<<control<<ON-OFF".
- Switch ON the heater.
- Enter desired parameter and observe the response by saving the graph.
- After completing the experiment, ensure all the connections are discarded and Switch OFF pump and heater

PRECAUTIONS TO BE FOLLOWED

- Pump and heater should not be switched off during the experiment
- The rotameter should be at minimum flow rate
- Ensure switch 'S2' in the left position
- Data acquisition card and the PC should be interfaced properly

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Principal