



Overview

The Process Control Trainer is a comprehensive laboratory training system designed to demonstrate fundamental and advanced principles of process control, including flow, level, pressure, and temperature control. The system integrates sensors, actuators, controllers, and real-time data acquisition components within a robust modular frame for academic and industrial training applications.

Technical Specifications

Mechanical Construction

- **Frame Structure:** Rigid aluminum column frame with modular panel arrangement.
- **Mounting:** Ergonomic layout for easy component access and clear process visualization.
- **Piping Layout:** Integrated with a clearly labeled **Piping and Instrumentation Diagram (P&ID)** for operational understanding.

Process Components

- **Water Pump:** 1 Unit – Industrial-grade centrifugal pump for process fluid circulation.
- **Water Filter:** 1 Unit – Ensures clean water supply within the process loop.
- **Manual Valves:** 6 Units – For manual regulation and isolation of process flow paths.
- **Motorized Proportioning Valve:** 1 Unit – For precise automatic control of flow.
- **Heat Exchanger:** 1 Unit – Facilitates heat transfer for temperature control experiments.
- **Heater:** 2 Units – Immersion-type heaters for process fluid heating.
- **Process Tank:** 1 Unit – Transparent process tank with inlet/outlet connections.
- **Sump Tank:** 1 Unit – Serves as the reservoir for recirculating process fluid.

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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Instrumentation

- **Water Flow Sensor:** 1 Unit – For real-time flow rate measurement.
- **Water Pressure Sensor:** 1 Unit – Monitors system pressure during operation.
- **Temperature Sensors:** 3 Units – High-accuracy RTD/thermocouple sensors for process temperature monitoring.
- **Thermostat:** 1 Unit – Provides temperature protection and control.
- **Float Switch:** 1 Unit – For liquid level monitoring and control.
- **Water Level Sensor:** 1 Unit – Continuous level measurement and feedback control.

Control & Electronics

- **Instrument and Control Panel:** 1 Unit – Houses power distribution, signal conditioning, and control circuitry.
- **Power Supply:** Built-in integrated regulated power supply for system operation.
- **Controllers:**
 - ON/OFF Level and Temperature Controller
 - Feedforward Controller for advanced control studies

Software & Documentation

- **Experiment Manual:** Detailed laboratory experiment guide in English.
- **User Manual:** Comprehensive setup, operation, and troubleshooting manual in English.

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