The Air Temperature Control Trainer is the system, which outlines the basics of Closed Loop Air Temperature Control and various aspects related to it.

KEY WORDS:

- Feedback AIR TEMPERATURE Control.
- ON-OFF & PID control.
- OPEN/CLOSE loop response.
- MANUAL/AUTO tuning of controller
- SCADA Based AIR TEMPERATURE Control
- P, P+I, P+I+D Controller Action.
- TRANSIENT response analysis study.
- USB / RS232 / RS 485/ Ethernet/ Modbus Communication.
- Ability to hook up with DCS (Distributed Control System Trainer)

TECHNICAL SPECIFICATION

Temperature Sensor/ Transmitter	Sensor Input: RTD / Thermocouple, Output: 4-20mA (For Transmitter only), Diameter: 6 mm, Sensor Length: 150 mm, DC Supply 24V, 50mA Range: 0- 100°C
Thyresterized phase angle control card	Input: 4-20mA, Panel mounted, Output: 0-230 V AC, 6A max.
Electronic PID Controller	With Serial PC Interface (ASCII Protocol) USB / Ethernet / RS 485 / RS232, Cut Out Size: 92mm×92mm×144mm, Input: RTD/4-20 mA Input type, Output; 4-20 mA, Display: Dual for PV & SP, Bar graph display. For Output & deviation, Alarm annunciation on Front fascia.
Oven/ Temp Cabinet	Dimension: 1.25 Ft. (L) X 1.25 (W) X 2 Ft. (H), insulation:1" thick glass wool thermostatic temperature control, With Thermostat And Air Circulation fan
Electrical Control Panel	MS Powder coated panel with switches, indicator, test points, Controller on front facia, UK 2.5 Terminal Connectors mounted on DIN rail channel, use of 0.5sq mm multistoried wire with proper insulated Lugs, Ferruling, neat wire dressing & clamping. Wires and power cables are seated through 1"×1" PVC cable tray
52201 Computer (Optional)	PC with color monitor: 18.5'', Intel Core i3, 500 GB HDD, 4GB RAM, Keyboard & Mouse, DVD Writer, With supporting OS and Communication port.
52202 SCADA Application Software (Optional)	SCADA Application S/W, PID control setting (P, PI, PD and PID mode), Auto/Manual Tuning of PID, Data Storage, Off Line analysis, online Data Acquisition, Simulation and Printing of data in Graphical and Tabular form. Interactive Graphical User Interface (GUI) included.

Range of experiments-

- Study of single loop proportional, integral and derivative control.
- Study of operation and calibration of sensors/transmitter.
- Study of OPEN LOOP/CLOSE LOOP TUNNING & AUTO TUNNING of controller.
- Study of STEP response & Transient response of controller (process curve).
- Study of stability of single loop Temperature control.
- Configure micro controller based PID to give manual output, change controller modes (Manual or Auto), give ON-OFF, proportional, integral, derivative PI and PID Control, change local set point, configure and run a set point ramp, configure measured values to either percentage or temperature.
- Demonstrate the use of RTD (or a transmitter) for the measurement of temperature of AIR. Show the operation of a thyristor to control the energy input of an electrical heater.

Note: Specifications are subject to change.
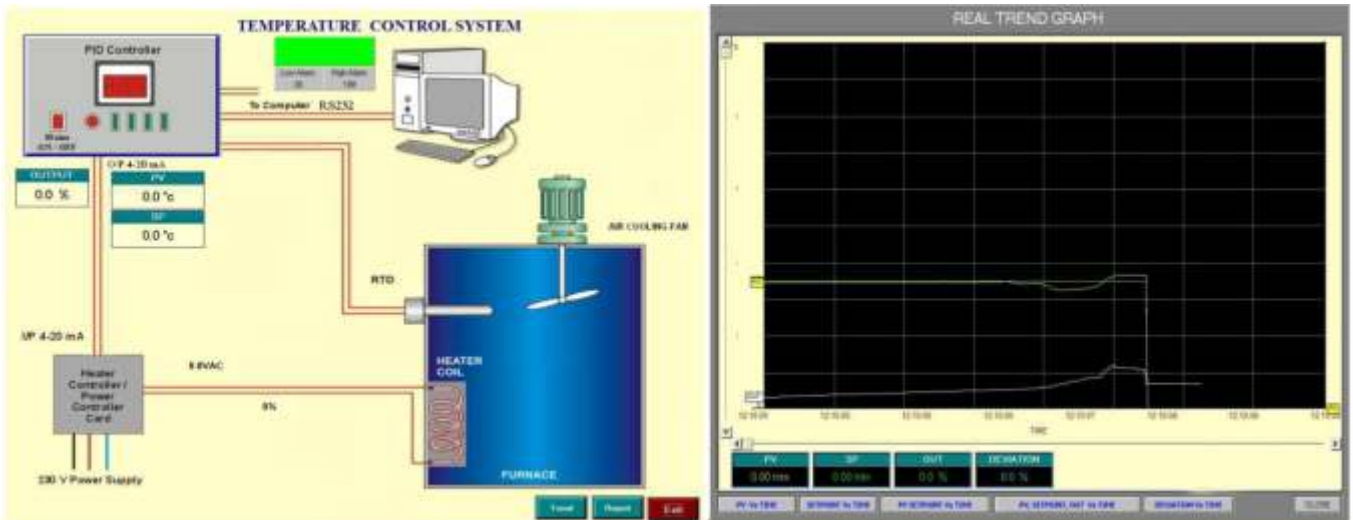
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- Demonstrate the proportional control of temperature, with offset, overshoot, Instability optimum value of proportional band or gain.
- Demonstrate the effect of integral control and the optimization of the integral (reset) time for temperature control.
- Optimize the parameters for PID control of temperature; demonstrate the use of automatic tuning.
- Study of SCADA Application Software/ Computerized Control of AIR Temperature Control System

Features-

- Compact Ergonomic Design.
- User Friendly, Self Explanatory Systems.
- Electrical control panel.
- Enhanced Electrical Safety Considerations.
- Training Manual, mimic Charts for Operation Ease.
- Inbuilt Safety Measures to avoid improper usage.
- Computer Interface & SCADA software connectivity for analysis of Temperature Control System Trainer (Optional).
- System Dimension: 2.5 Ft. (L) X 1.5 Ft. (W) X 2
- Weight: Approx. 30Kg
- Services Required: 1) Electric supply 1φ 230 V AC, 50 Hz.

      2) Laptop/Desktop Computer (for SCADA)

52202 SCADA APPLICATION SOFTWARE (Optional):

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