

**SAP E&C VERIFICATION OF P, P+I, P+D, P+I+D CONTROL  
ACTIONS Close Loop Temperature Control System for  
Study of Electronic PID Controller (PCST-09)**



The Temperature control system trainer is the system, which outlines the basics of Temperature Control loop and other aspects related to it.



**KEY WORDS:**

- ❖ Feedback control.
- ❖ PID control.
- ❖ Temperature control.
- ❖ P,P+I, P+I+D CONTROLLER ACTION.

**Technical Specification: -**

- ❖ Temperature Transmitter: - Input: RTD, Output: 4-20 mA,  
(OPTIONAL) Type: 2-wire type, Range: 0-200 ° C,
- ❖ Sensor: - RTD, Diameter: 6 mm,  
Length: 150 mm, 3 Wires, with Temperature Compensation.
- ❖ Thyristorized Phase Angle Control Card: - Input: 4-20 mA,  
Output: 0-230 VAC variable, 10 A Max.  
Dimension: 100 mm ×150 mm
- ❖ Electronic PID Controller: - with Serial PC Interface (ASCII Protocol) RS232,  
Cut Out Size: 92mm×92mm×144mm,  
Input: 4-20 mA, Output; 4-20 mA,  
Display: Dual for PV & SP, Barograph display  
For Output & deviation, Alarm annunciation on  
Front facia.
- ❖ Oven/Temp. Cabinet: - Dimension: 1Ft. (L) X 1 (W) X 1 Ft. (H) with air circulation fan.
- ❖ Electrical Control Panel: - MS Powder coated panel with switches, indicator,  
Terminal Connectors mounted on DIN rail Channel.  
Use of 1sq mm Multistrand wire with  
Proper insulated Lugs, Ferruling & neat wire  
Dressing & clamping  
Dimension: 1.5ft (L) ×1ft (W) ×1ft (H).
- ❖ Computer: - PC with color monitor: 15", PC Pentium Dual Core, with serial  
(Optional) communication ports, 160/300 GB HDD, 512 MB / 1 GB RAM,  
SCADA Application software (Optional) SCADA 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.

For More Details Visit Our Website At: [www.sapengineers.com](http://www.sapengineers.com), E-mail:- [pravinsdeode@vsnl.net](mailto:pravinsdeode@vsnl.net)

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**Features: -**

- ❖ Compact Ergonomic Design.
- ❖ User Friendly, Self Explanatory Systems.
- ❖ Electrical control panel with temperature cabinet.
- ❖ Enhanced Electrical Safety Considerations.
- ❖ Training Manuals, 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).

**Range of Experiments:**

- ❖ Study of single loop proportional, integral and derivative control.
- ❖ Study of operation and calibration of transmitters.
- ❖ Study of stability of Temperature control loop.
- ❖ Configure micro controller based PID to give manual output, change controller mode as 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 flowing air and a heater.
- ❖ Show the operation of a thyristor to control the energy input to an electrical heater.
- ❖ Demonstrate the proportional control of temperature, with offset, overshoot, instability and 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 Closed Loop Temperature control system (For study of Electronic PID controller)

**Temperature Cabinet Dimension: -** 1Ft. (L) X 1 (W) X 1 Ft. (H)

**System Control Panel Dimensions: -** 1.5Ft. (L) x 1Ft. (W) x 1Ft. (H)

- ❖ **Services Required:** Electric supply 230 V AC, 50 Hz.

**Note:** All descriptive matter and illustrations are intended to give only a general idea of the equipment. Detailed specifications may be altered at the company's discretion without notice.

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