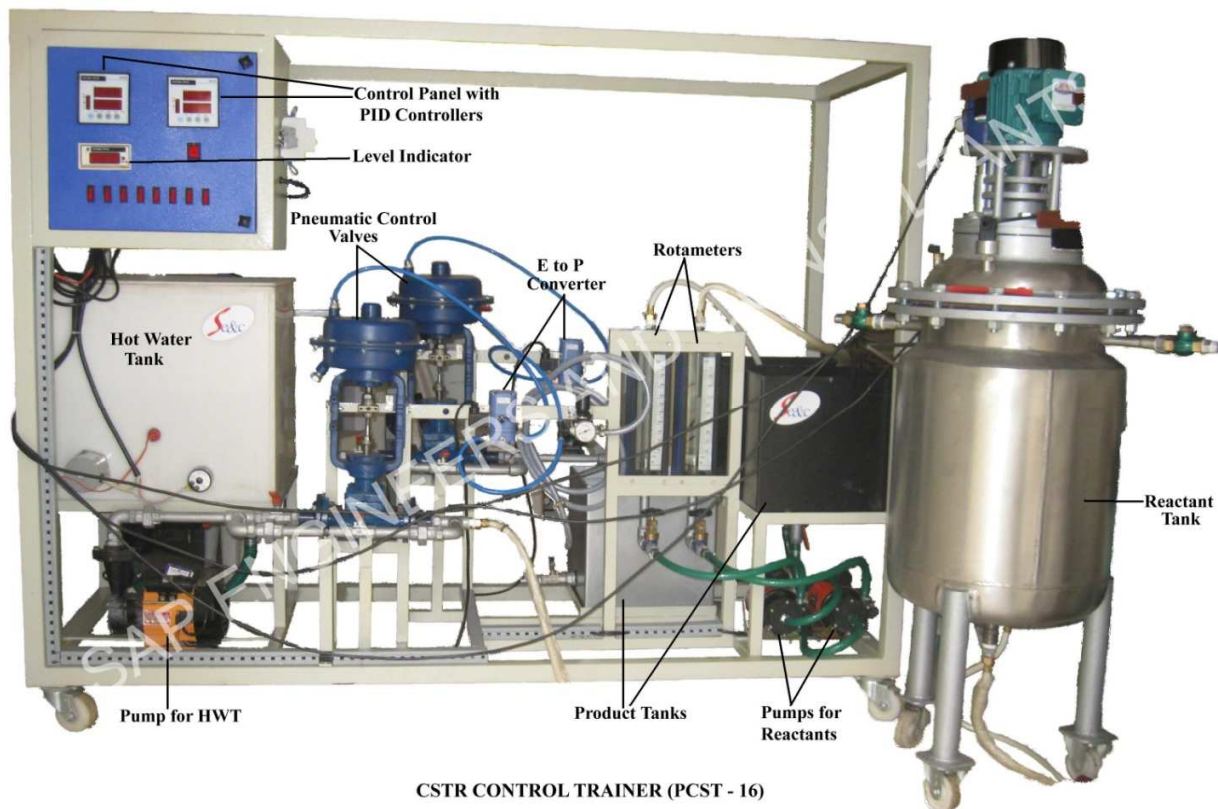


SAP E & C CSTR CONTROL TRAINER
(PRODUCT CODE: PCST – 16)



CSTR CONTROL TRAINER (PCST - 16)

The **CSTR Control System Trainer** is the system, which outlines the basics of Temperature and Pressure Control inside CSTR and other aspects related to it.

KEY WORDS:

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

Technical Specification-

| No. | Item Name | Technical Specifications |
|-----|--------------------------|---|
| 1 | Hot water Tank (HWT)- | Material: polypropylene, rust proof, cover on the top Capacity: 80 liter. Dimension: 18" (L) ×18" (W) ×18" (H) |
| 2 | Reactant Tanks- | 2 Nos., Material: PVC Foam sheet, Capacity: 30 liter. Dimension: 12" (L) ×12" (W) ×12" (H) |
| 3 | Product Tank - | 1 No., Material: PP, Capacity: 30 liter. Dimension: 12" (L) ×12" (W) ×12" (H) |
| 4 | Pump For HWT- | Type: Centrifugal pump, Capacity: ½ HP, Supply: 1φ 230V AC, Temperature: 100° C, Discharge: 1200 LPH, Size: 19mm×19mm. |
| 5 | Piping- | ½" GI, Class B, with ½" SS ball valves: 20 no.s |
| 6 | Pump for reactants- | 2 Nos., Type: Centrifugal pump, Capacity: ½ HP, Supply: 230V AC Temperature: 100° C, Discharge: 1000 LPH, |
| 7 | Temperature Transmitter- | Input: RTD, Output: 4-20 mA, 24 V DC operated, Type: 2-wire type, Range: 0-200°C, |
| 8 | Pressure Transmitter- | Input: 0-2.5 Kg/cm ² / 0-4 Kg/cm ² , Output: 4-20 mA Type: 2-wire Piezoresistive type, Mounting: Top ½" BSP connection |

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| | | |
|----|---|---|
| 9 | Level Transmitter- | Input: 0-500 mm, Output: 4-20 mA, Supply: 24 V DC, 100 mA. Type: 2-wire Capacitance Type, Mounting: Top 2" Screwed Connection |
| 10 | Level Indicator- | 3 ½ Digit Display, Inbuilt 24VDC Supply, Operation on 230V AC, 50Hz |
| 11 | Miniature Level Switch- | Float Type, Mounting: Side mounting, NO/NC type selectable, Switching Current: 0.5A, 1φ 230 VAC operating. |
| 12 | E/P Converter- | 02 Nos., Input: 4-20 mA, Output: 3-15 psi, Connection: ¼" NPT / BSP, Supply: 1.4 Kg/cm ² . |
| 13 | Heater coil- | Size: Circular in shape, 1" diameter, Mounting: Side mounting on the tank. Connection: 1 ½", Power: 4000 Watts, 230 V AC. |
| 14 | Pneumatic control valves | 02 Nos., Size: ½", Characteristics: Equal Percentage, Type: Two ways Globe type (Air to close), Cv: 5 US GPM & 2 US GPM, with diaphragm actuator. Area 18 sq. inch. Flange connection: PCD: 60 mm, ID: 16 mm, OD: 90 mm. |
| 15 | Rotameter- | 2 Nos., Range: 100-1000 LPH, Glass Tube Type/ Acrylic body, Connection: ½", Bob material: SS 304, Mounting: Inlet Bottom Outlet Top, Temperature: 100° C |
| 16 | Thermostat- | Type: Bi-metallic type, Length: 8", Temperature Range: 0-150° C (Temperature controller) Mounting: Side mounting thermo well insertion Type, |
| 17 | Electrical Control Panel- | MS Powder coated panel with switches, indicator, Test Points, controller on front fascia, UK 2.5 Terminal Connectors mounted on DIN rail Channel. Use of 1sq mm multistrand wire with Proper insulated Lugs, Ferruling & neat wire dressing & clamping Wires & power cables are seated through 1"x1" PVC cable tray. Dimension: 1ft (L) x1ft (W) x1ft (H). |
| 18 | Electronic PID Controller: - | 02 Nos., with Serial PC Interface (ASCII Protocol) USB / Ethernet / RS 485 / RS232, Cut Out Size: 92mmx92mmx144mm, Input: 4-20 mA, Output; 4-20 mA, Display: Dual for PV & SP, Bar graph display for Output & deviation, Alarm annunciation on Front fascia. |
| 19 | Computer- (Optional) | PC with color monitor: 17", PC Pentium Dual Core, with serial communication ports, 160/300 GB HDD, 1 GB / 2 GB RAM, CD Drive. |
| 20 | 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) includes. |

Reactor-

| | |
|---------------------|-------------------------------|
| Shell Position- | Vertical |
| Inside Diameter- | 300mm |
| Straight Height- | 600mm |
| Top Head- | Dished, Bolted |
| Bottom Head- | Dished, welded |
| Shell Gross Volume- | 40ltrs |
| Design Temperature- | 200°C |
| Designed pressure- | 5kg/cm ² |
| Thickness- | 4mm |
| MOC- | SA-240Gr.304 |
| Mixer model- | AX-C-0.18 |
| Motor- | Crompton make, 0.18kW/1350RPM |
| Mixer speed- | Direct driven |
| Impeller- | 1X pitched blade |
| Shaft length- | 500mm |

Range of experiments:

- ❖ Feedback Temperature Control Loop.
- ❖ Feedback Pressure Control Loop
- ❖ Study of SCADA Application Software/ Computerized Control of CSTR.

Features: -

- ❖ Compact Ergonomic Design.
- ❖ User Friendly, Self Explanatory Systems.
- ❖ Leak proof Safety Measures, sturdy piping.
- ❖ Enhanced Electrical Safety Considerations.
- ❖ Training Manuals & mimic Charts for Operation Ease.
- ❖ System Frame with Caster Wheel Arrangement for ease in movement.
- ❖ M.S. powder coated cubical plant with standard Instrument Mountings.
- ❖ Inbuilt Safety Measures to avoid improper usage.
- ❖ Computer Interface (Optional).
- ❖ SCADA software connectivity for analysis of temperature and pressure control loop.

System Components-

- ❖ CSTR with stirrer.
- ❖ Water heating system.
- ❖ Hot water & reactants storage tanks.
- ❖ Hot water & reactants circulation system.
- ❖ Flow monitoring on Rotameter.
- ❖ Level indicator.
- ❖ Capacitive Level transducer
- ❖ RTD based Temp. Transmitter with 4-20 mA o/p for reactor temperature.
- ❖ Pump (3 Nos.) for hot water and reactants.
- ❖ Pneumatically operated control valves & electro pneumatic converter for regulation of hot water through jacket for control of temperature inside reactor.
- ❖ PID controller (2 Nos.) with RS- 232 port connectivity.

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System Dimension: 6 Ft. (L) X 2.5 Ft. (W) X 5.5 Ft. (H)

Services Required:

- ❖ Electric supply 1 ϕ 230VAC, 50Hz.
- ❖ Water Supply and Drainage Arrangement.
- ❖ Clean, dry Compressed air supply at 2.1 Kg/cm².

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 any notice.

Manufactured/Marketed By

SAP ENGINEERS & CONSULTANTS

Regd. Off. : Shop No. 26-27,'Srushti', Survey No.82, Near Guru Ganesh Nagar,
Eklavya College Road (D.P.Road), Kothrud, Pune - 411 038

Telephone : (020) 2538 4737

Mobile : 94220 88946, 95524 75082

Fax : (020) 2538 3544

Email : pravinsdeode@vsnl.net, sapengineerspune@gmail.com

Website : www.sapengineers.com / www.sapengineers.co.in

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