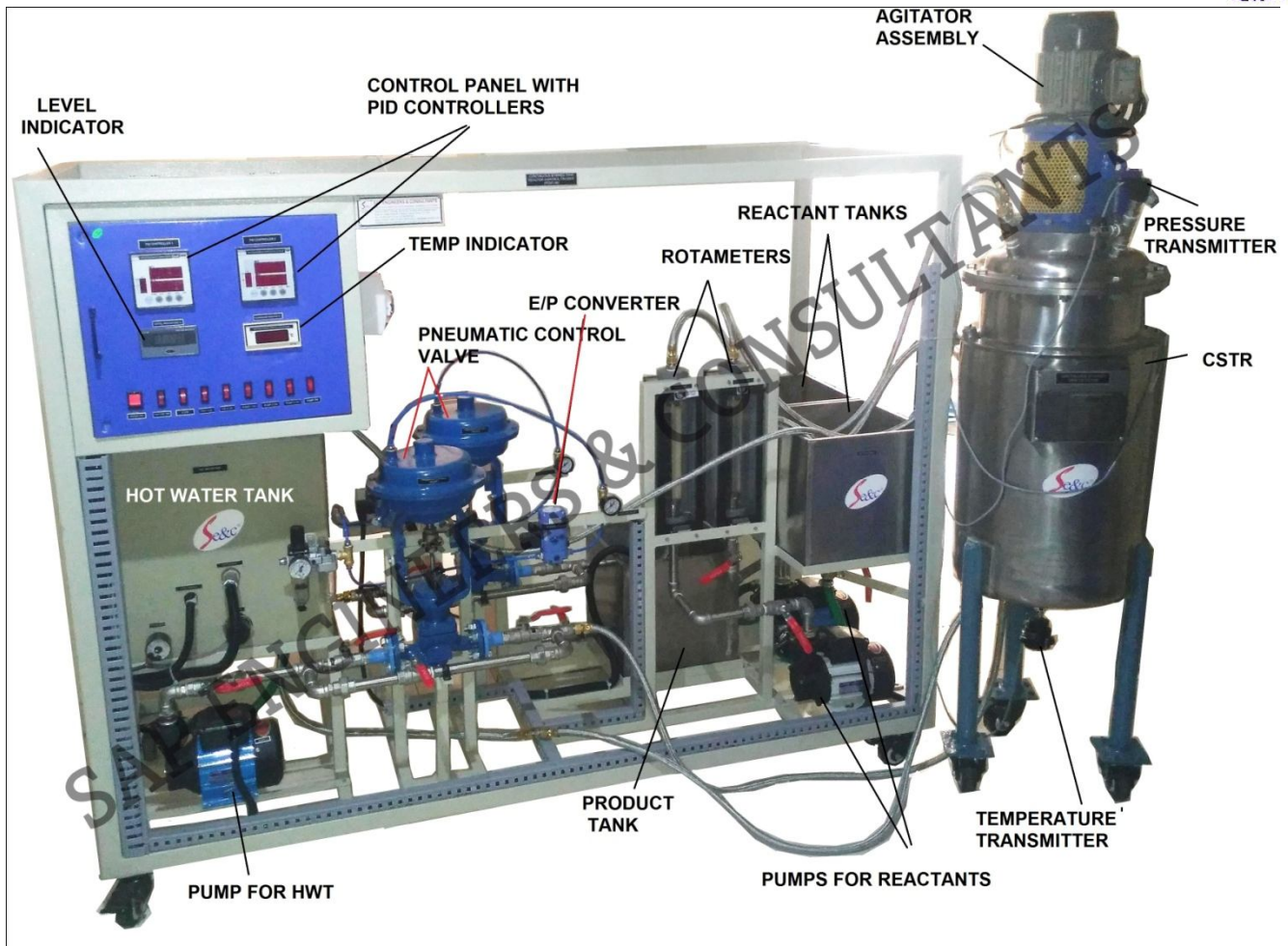


SAP E & C CSTR CONTROL TRAINER
(PRODUCT CODE: PCST-16)



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: 2mm thick PVC Foam sheet/SS, Capacity: 30 liter, with top cover, Dimension: 12" (L) × 12" (W) × 12" (H)
3	Product Tank -	1 No., Material: PP, Capacity: 30 liters, with top cover, 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: 1000 LPH, Size: 19mm×19mm.
5	Piping-	½" GI, Class B, with ½" SS ball valves: 20 nos.
6	Pump for reactants-	2 Nos., Type: Centrifugal pump, Capacity: ½ HP, Supply: 230V AC Temperature: 100° C, Discharge: 1000 LPH,
7	Temperature	Input: RTD, Output: 4-20 mA, 24 V DC operated,

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	Transmitter-	Type: Head mounting, 2-wire type, Range: 0-200°C,
8	Pressure Transmitter-	Input: 0-2.5 / 0-4 Kg/cm ² , Output: 4-20 mA Type: 2-wire Piezo-resistive type, Mounting: Top ½" BSP connection
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	Temperature Indicator	3 ½ Digit Display, input: RTD, Inbuilt 24VDC Supply, Operation on 230V AC, 50Hz, with PT100 sensor: 50mm length, 1/2" bsp connection, 1mtr cable.
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 0.5sq mm multistrand wire with Proper insulated Lugs, Ferruling & neat wire dressing & clamping Wires & power cables are seated through 1"×1" PVC cable tray. Dimension: 1ft (L) × 1ft (W) × 1ft (H).
18	Electronic PID Controller: -	02 Nos., with Serial PC Interface (ASCII Protocol) USB / Ethernet / RS 485 / RS232, Cut Out Size: 92mm×92mm×144mm, 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: 18.5", Intel Core i3, 500 GB HDD, 4GB RAM, Keyboard & Mouse, DVD Writer, With supporting OS and Communication port.
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-

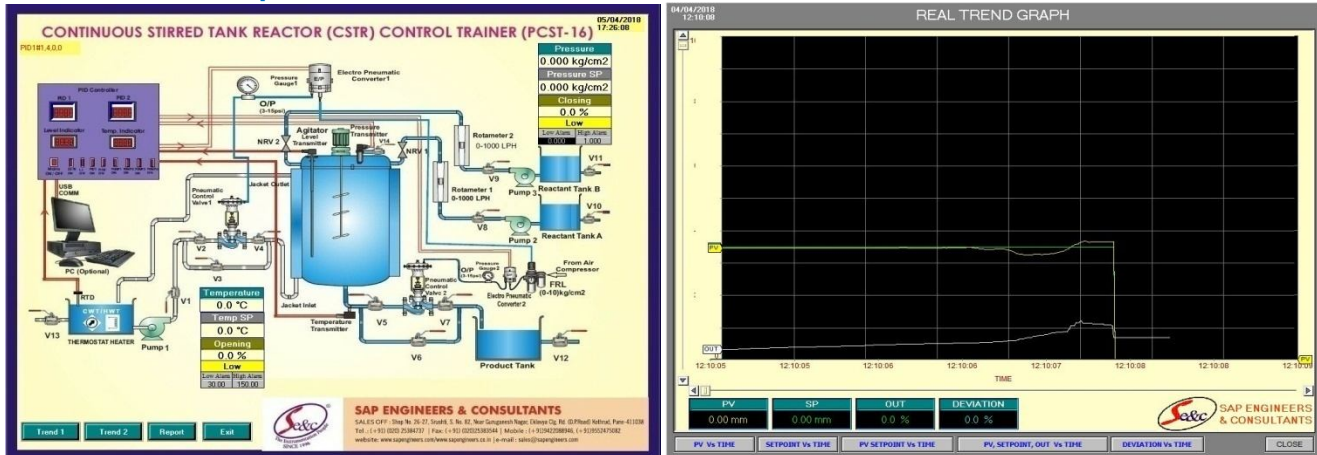
Shell Position-	Vertical
Inside Diameter-	300mm
Straight Height-	600mm
Top Head-	Dished, Bolted
Bottom Head-	Dished, welded
Shell Gross Volume-	40ltrs
Design Temperature-	200°C
Designed pressure-	5kg/cm ²
Thickness-	4mm
MOC-	SA-240Gr.304
Mixer model-	AX-C-0.18
Motor-	Crompton make, 0.18kW/1350RPM
Mixer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

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Impeller-	1X pitched blade
Shaft length-	500mm

SCADA Software (Optional):



Range of experiments:

- ❖ Feedback Temperature Control Loop.
- ❖ Feedback Pressure Control Loop
- ❖ Study of Monitoring & controlling operation of CSTR.
- ❖ Study of SCADA Application Software/ Computerized Control of CSTR (OPTIONAL).

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(optional).

System Components-

- ❖ CSTR with stirrer.
- ❖ Water heating system.
- ❖ Hot water & reactants storage tanks.
- ❖ Hot water & reactants circulation system.
- ❖ Flow monitoring on Rotameter.
- ❖ Temperature & Level indicator.
- ❖ Capacitive Level, Pressure sensor/transmitter module.
- ❖ RTD based Temp. Transmitter with 4-20 mA o/p for reactor temperature.
- ❖ Pump (3 Nos.) for hot water and reactants.
- ❖ Pump (1no.) for draining fluid from product tank.
- ❖ Pneumatically operated control valves & electro pneumatic converter for regulation of hot water through jacket for control of temperature & pressure inside reactor.
- ❖ PID controller (2 Nos.) with RS- 232/485/ETHERNET/USB port connectivity.

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System Dimensions: A] Instrumentation panel/plant: 6 Ft. (L) X 2.5 Ft. (W) X 5 Ft. (H)
Weight: Approx. 175Kgs.

B] CSTR/Reactor: 2Ft.X1.5Ft.X5.5Ft.
Weight: Approx. 100 Kgs

Services Required:

- ❖ Electric supply 1 ϕ 230VAC, 50Hz.
- ❖ Water Supply and Drainage Arrangement.
- ❖ Clean, dry Compressed air supply at 2.1 Kg/cm².
- ❖ Laptop/Desktop Computer (FOR SCADA)

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

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