SAP E &C HEAT EXCHANGER TEMPERATURE CONTROL TRAINER
(PRODUCT CODE: PCST - 07)

SHELL & TUBE TYPE HEAT EXCHANGER

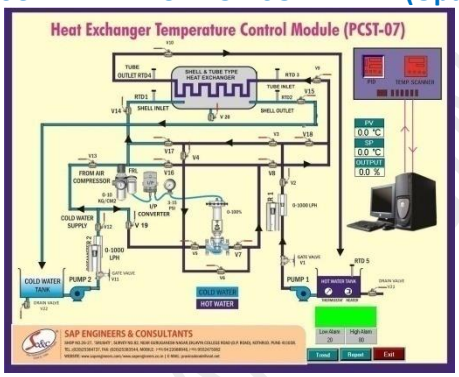
PLATE TYPE HEAT EXCHANGER

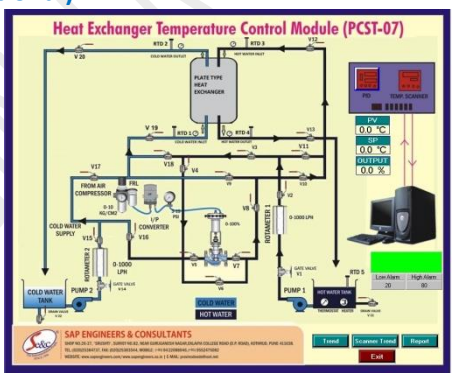
Technical Specification:

No.	Item Name	Technical Specifications
1	**Hot water Tank (HWT)-**	Material: Polypropylene, rustproof, covered on the top Capacity: 80 litres. Dimension: 18" (L) ×12" (W) ×20" (H)
2	**Cold Water Tank (CWT)-**	Material: SS304 - 1.5 mm thick / Polypropylene 5mm thick, Capacity: 50 litres, with top cover, Dimension: 18" (L) ×12" (W) ×14" (H)
3	**Piping-**	½" GI, Class B/SS Piping (Optional), with ½" SS ball valves: 20 nos.
4	**Pump For HWT-**	Type: Centrifugal pump, Capacity: ½ HP, Supply: 1ϕ 230V AC Temperature: 100º C, Discharge: 1200 LPH,
5	**Pump For CWT-**	Type: Centrifugal pump, Capacity: ½ HP, Supply: 1ϕ 230 V AC Temperature: 100º C, Discharge: 1200 LPH
6	**Heater coil-**	Size: Circular in shape, 1''diameter, Mounting: Side mounting on the tank. Connection: 1 ½", Power: 3KW / 4 KW Watts, 1ϕ 230 V AC.
7	**Pneumatic control valve-**	Size: ½", Chacteristics:Equal %, Type: Two ways Globe type (Air to close) CV: 5 US GPM, with diaphragm actuator. Area 10 sq. inch. Flange connection: PCD: 60 mm, ID: 16 mm, OD: 90 mm.
8	**Rotameter-**	2 Nos., Range: 100-1000 LPH, Glass Tube Type/ Acrylic body, Connection: ½", Bob material: SS 304, Mounting: Inlet Bottom Outlet Top. Pressure: 3 Kg/cm^2, Temperature: 100º C
9	**Thermostat/ Temperature-(Temperature controller)**	Type: Bi-metallic type, Length: 8", Mounting: Side mounting thermo well insertion Type, Temperature Range: 0-150º C
10	**Four Point Temperature Indicator/ Transmitter -**	Input: RTD pt- 100 type, Range: 0-200º C, Display: 3 ½ digit LCD Display× 4 nos. Size: 96mm×144mm×188 mm, Mounting: Panel mounting, Retransmission Output: 0-2 VDC×4 nos.
11	**Heat Exchanger-Shell & Tube type / Plate type**	Type: Shell & Tube type / Plate type, 12", Shell (Drum) Length: 30", Shell (Drum) Wall thickness: 8 mm, Tube material: copper, Tube Wall thickness: 1.5 mm, Length of Cu tube for heat transfer: 31 ft Temperature Range: 100º C, End Connection: ½" BSP.

12	**Temperature Sensors-**	4 nos. Type: Pt-100 (RTD) type, Length: 2", Tube Diameter: 6 mm, Connection: ½" BSP threading SS socket welded.
13	**Skid / Frame-**	Dimension: 70"×20"×48", Cube Size: 40×40×18 gauge, MS painted frame mounted on castor wheels for Smooth movable operation
14	**E/P Converter -**	Input: 4-20mA, Output: 3-15 psi. Connection: ¼" NPT / BSP.
15	**A.F.R. / F.R.L. Unit-**	0-10 Kg/cm^2 with pressure gauge, Connection: ¼" NPT / BSP.
16	**Miniature Level Switch-**	Mounting: Side mounting, NO/NC type selectable, 24 V DC operated, Switching Current: 0.5A
17	**Electronic PID Controller-**	PID controller is single loop PID Serial PC Interface (ASCII Protocol) USB / Ethernet / RS 485 / RS 232, Cut Out Size: 92mm×92 mm×144mm, Input: RTD, Output: 4-20 mA, Range: 0-400º C. Display: Dual for PV & SP, Bar graph display for Output & deviation, Hi-Low alarm annunciation.
18	**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 0.5 sq. mm multistand 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).
19	**SCADA Application Software (Optional)-**	SCADA S/W, experimentation, PID control setting (P, PI, PD and PID mode), Auto/Manual Tunning of PID, Data Storage, Off Line analysis, Online Data Acquisition, Simulation and Printing of data in Graphical and tabular form. Interactive User Interface (GUI).
20	**Computer (Optional)-**	PC with color monitor: 18.5'', Intel Core i3/i5, 500 GB HDD, 4GB RAM, Keyboard & Mouse, DVD Writer, With supporting OS and Communication port.
21	**Air Compressor (Optional)-**	Tank capacity: 20/24 Litres, Discharge: 2 CFM Motor: 1 H.P./2 H.P, 1ϕ, 230 V AC Operated, Working pressure: 5-6 kg/cm^2

SCADA APPLICATION SOFTWARE (Optional):





System Components-

- Shell & Tube type OR Plate Type heat exchanger.
- Water heating system.
- Hot & cold water storage tanks.
- Hot & cold-water circulation system.
- Flow monitoring on Rotameter.
- RTD temperature sensors for inlet & outlet temperature of tubes & Shell. (4 Nos.)
- Temp. Transmitter with 4-20mA o/p for both inlet & outlet/Temperature sensors compatible with four point temperature Indicator.
- Pump for HWT / CWT.

- Pneumatically operated control valve & electro pneumatic converter for regulation of hot water through shell for control of cold water outlet temperature
- PID controller with USB / Ethernet / RS 485 / RS- 232 port connectivity.

Range of experiments:

- Study of Shell & Tube type/Plate type Heat Exchanger.
- Study of Feed Back Temperature Control Loop.
- Study of SCADA Application Software/ Computerized Control of Heat Exchanger Temperature Control System.

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 Application software connectivity for analysis of temperature control loop using Tube and Shell/Plate type heat exchanger (Optional)

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

Weight: Approx. 95kg.

Services Required:

- Water Supply and Drainage Arrangement.
- Clean, compressed, dry air supply at 2.1 Kg/cm².
- Electric Supply 1ϕ 230 V AC, 16A, 50 Hz.
- 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
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, India
Telephone : (020) 2538 4737
Mobile : +91 94220 88946, +91 9552475082
Fax : (020) 2538 3544
Email : sales@sapengineers.com
Website : www.sapengineers.com / www.sapengineers.co.in