Order Code - 52239
Heat Exchanger Temperature Control Trainer

SHELL & TUBE TYPE HEAT EXCHANGER

PLATE TYPE HEAT EXCHANGER

TECHNICAL SPECIFICATION

Hot water Tank (HWT)	Material: Polypropylene, rustproof, covered on the top Capacity: 80 litres. Dimension: 18" (L) X12" (W) X20" (H)
Cold Water Tank (CWT)	Material: SS304 - 1.5 mm thick / Polypropylene 5mm thick, Capacity: 50 litres, with top cover, Dimension: 18" (L) X12" (W) X14" (H)
Piping	½" GI, Class B, with ½" SS ball valves: 20 nos.
Pump For HWT	Type: Centrifugal pump, Capacity: ½ HP, Supply: 1f 230V AC Temperature: 100°C, Discharge: 1200 LPH,
Pump For CWT	Type: Centrifugal pump, Capacity: ½ HP, Supply: 1f 230 V AC Temperature: 100° C, Discharge: 1200 LPH
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.
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.
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/cm2, Temperature: 100'I C
Thermostat/ Temperature (Temperature controller)	Type: Bi-metallic type, Length: 8", Mounting: Side mounting thermo well insertion Type, Temperature Range: 0-150'I C
Four Point Temperature Indicator/ Transmitter	Input: RTD pt- 100 type, Range: 0-200'I C, Display: 3 ½ digit LCD Display× 4 nos. Size: 96mmX144mmX188 mm, Mounting: Panel mounting, Retransmission Output: 0-2 VDC×4 nos.
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: 100'I C, End Connection: ½" BSP.
Temperature Sensors	4 nos. Type: Pt-100 (RTD) type, Length: 2", Tube Diameter: 6 mm, Connection: ½" BSP threading SS socket welded.

Note: Specifications are subject to change.

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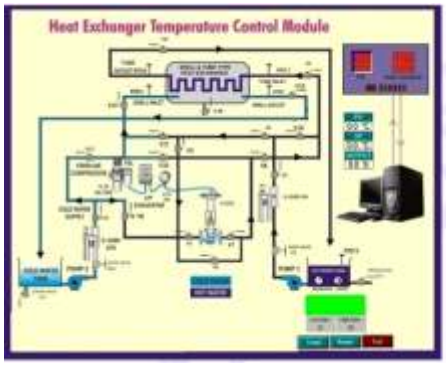
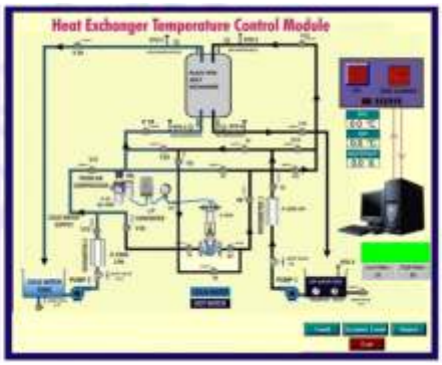
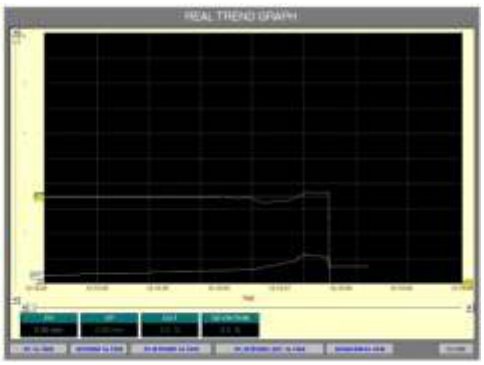
Skid / Frame	Dimension: 70"×20"×48", Cube Size: 40×40×18 gauge, MS painted frame mounted on castor wheels for Smooth movable operation
E/P Converter	In put: 4-20mA, Output: 3-15 psi. Connection: ¼" NPT / BSP.
A.F.R. / F.R.L. Unit	0-10 Kg/cm^2 with pressure gauge, Connection: ¼" NPT / BSP.
Miniature Level Switch	Mounting: Side mounting, NO/NC type selectable, 24 V DC operated, Switching Current: 0.5A
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: 0-400°C. Display: Dual for PV & SP, Bar graph display for Output & deviation, Hi-Low alarm annunciation.
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).
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 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).
52203 Air Compressor (Optional)	Tank capacity: 25 Litres, Discharge: 2 CFM Motor: 1 H.P. 230 V AC Operated, Working pressure: 5-6 kg/cm^2

52202 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.

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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)

Services Required:

- Water Supply and Drainage Arrangement.
- Clean, compressed, dry air supply at 2.1 Kg/cm².
- Electric Supply 1f 230 V AC 50 Hz.
- Laptop/Desktop computer (FOR SCADA)

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