

HT-115

SHELL & TUBE HEAT EXCHANGER



Shell and Tube Heat Exchanger are popular in process industries because they occupy less space and offer reasonable temperature drop. The apparatus consists of fabricated shell, inside which tubes with baffles on outer side are fitted. The present set up is a 1-2 heat exchangers, with cold water flows through shell. Valves are provided to control the flow rates of hot and cold water. Flow rates of hot and cold water are measured using Rotameters. A magnetic drive pump is used to circulate the hot water from a re-cycled type water tank, which is fitted with heaters and Digital Temperature Controller.

SCOPE OF EXPERIMENTATIONS:

- The main object of the experimental setup is to study the following at various flow rates:
 - (i) LMTD
 - (ii) Heat transfer rate
 - (iii) Overall Heat Transfer Co-efficient.

UTILITIES REQUIRED:

- Water supply 20 lit/min (approx.) and drain.
- Electricity Supply : 1 Phase, 220 V AC, 4 kW.
- Floor area of 1.5 m x 0.75 m.

TECHNICAL DETAILS:

- System : Water to Water. (1 – 2 shell & tube type)
- Shell : Material Stainless steel. Insulated with ceramic wool and clad with aluminum foil.
Dia. 220 mm, Length 500 mm (Approx.)
25% cut baffles at 100 mm distance 4 Nos.
- Tube : OD 16mm approx., Length 500mm (24 Nos.)
- Water Flow Measurement : Rotameters (2Nos.) one each for cold & hot fluid.
- Hot Water Tank : Made of Stainless steel
Insulated with ceramic fibre wool.
- Hot Water Circulation : Magnetic Pump
- Heaters : Nichrome wire heater (2 Nos.)
- Control panel comprising of:
 - Digital Temperature Controller : 0-199.9°C, (For Hot Water Tank)
 - Digital Temperature Indicator : 0-199.9°C, with multi-channel switch
 - Temperature sensors : RTD PT-100 type.
 - With Standard make On/Off switch, Mains Indicator etc.
- A good quality painted rigid MS Structure is provided to support all the parts.