

SHELL & TUBE HEAT EXCHANGER (EE-1573)

Shell and Tube Heat Exchanger are popular in industries because they occupy less space and offer reasonable temperature drop. The apparatus consists of fabricated SS shell, inside which tubes with baffles on outer side are fitted. It is two-pass heat exchanger so that hot water passes to one end of shell through the tubes and returns to another end through remaining tubes. The cold water is admitted at the one end of shell, which passes over the hot-water tubes. 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.

EXPERIMENTS:

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



UTILITIES REQUIRED:

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

TECHNICAL DETAILS:

-) System :Water to Water
-) Shell : Material Stainless steel, Dia. 220 mm, Length 500 mm (Approx.), 25% cut baffles at 100 mm distance 4 Nos.
-) Tube : ID 13mm, OD 16mm, Length 500 mm (24 Nos.)
-) Water Flow Measurement: Measuring cylinder & Stop Watch with 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 made of Polypropylene to circulate Hot Water.
Maximum working temperature is 85°C.
-) Heaters : 2 kW Nichrome wire heater
-) Temperature Sensors : RTD PT-100 type 5 Nos.
-) Control panel : Digital Temperature Controller: 0-199.9°C (For Hot Water Tank), Digital Temperature Indicator: 0-199.9°C, with multichannel switch, On/Off switch, Mains Indicator etc
A good quality painted rigid MS Structure is provided to support all the parts.