H-6850-10

Double-pipe Heat Exchanger (oil/water)

Purpose

The Hampden **Model H-6850-10** Double-Pipe Heat Exchanger has been developed to enable students to investigate in detail the heat-transfer characteristics of a double-pipe heat exchanger. The working fluids of this unit are water and oil.

Description

This unit consists of a double-pipe heat exchanger with oil flowing in the inner tube and water flowing in the outer tube. The system can be operated in either the parallel-flow or counter-flow modes by the appropriate valving of the water. The oil can be heated by an immersion heater which comes with a thermostat to control the inlet oil temperature. The water source can be any nearby water outlet. The double-pipe heat exchanger is fully insulated so that the system is a closed one, i.e., there are no heat sources or sinks other than those built into the system. The fluid temperature is measured by type T thermocouples and is displayed on a digital temperature meter which comes with a selector switch to choose which thermocouple is being monitored. This digital temperature meter has an accuracy of ±2°C and a resolution of 1°C. The flow rates of the water and oil are indicated by separate rotameters which can measure up to 5 gpm of oil or up to 4 gpm of water. The flow through each side of the heat exchanger is regulated by two (2) needle valves.

The double-pipe heat exchanger comes complete with all the necessary equipment to perform the various experiments. Quick disconnect inlet/outlet ports are supplied for the connection of a water line, together with four (4) ball valves to arrange the flow in either the parallel-flow or counterflow mode of operation. This unit uses non-ferrous tubing of ½" inner diameter and 1" inner diameter for the double-pipe heat exchanger. The oil flow is laminar in nature while the water can be regulated to be either laminar or turbulent in nature. The trainer is equipped with an oil pump - ½ hp, 5 gpm; an oil reservoir; an oil heater, which is thermostatically controlled; and a separate oil thermocouple and oil pressure gauge. Also, the unit is supplied with a sufficient quantity of oil to fill the system.

This unit is permanently mounted on a code-gauge furniture stock steel finished in grey hammertone enamel with a 1-1/4" laminated wood top covered with Formica. The bench is mobile with 2 swivel and 2 locking swivel casters. The unit can be operated up to 180°F.

Also supplied with this unit is an instruction manual. This manual covers the experimental techniques used and gives the user a background in heat-transfer theory needed to calculate the conduction heat-transfer coefficient, convection heat-transfer coefficient, overall heat-transfer coefficient, overall thermal efficiency of the heat exchanger, energy balance of system, and develop temperature diagrams. The manual also develops the logarithmic temperature difference method and the effectiveness method for the determination of the efficiency of the system for either parallel flow or counterflow operation.

Services Required

Power: 120VAC, 1Ø, 60 Hz
Water: 5 gpm @ 60 psi

All Hampden units are available for operation at any voltage or frequency

Hampden® ENGINEERING CORPORATION

072403

P.O. Box 563, East Longmeadow, MA 01028 • Tel 413-525-3981 • Fax 413-525-4741 • E-mail sales@hampden.com **800-253-2133**