

# Heat Transfer Training Systems

Educational Training Equipment for the 21st Century

Bulletin 687-5A

## H-6875 Steam to Water Heat Exchanger

### Purpose

The Hampden **Model H-6875** Steam to Water Heat Exchanger has been developed to permit student study of the characteristics of shell and tube type heat exchangers. The student has the opportunity to determine the effects of water flow rates and temperature for the overall heat transfer coefficient.

### Description

The Hampden **Model H-6875** Steam to Water Heat Exchanger is table top mounted 36" high, 36" wide, by 8" deep or 20" deep including feet. Its major components include a steam chamber consisting of a 4" diameter 18" Corning Pyrex® heavy wall conical system with associated cast iron flange adapters, TFE type T gaskets and 1/4 hard brass plates. The steam chamber also incorporates a three-tier stainless steel baffle assembly, two 1500 watt heaters with plug assembly, three type T thermocouples, four u-tube condensers, quick-disconnect water lines, pressure relief valve, gauge interface and three interface inserts for single, double or four pass operation.

The control panel consists of one 1 gallon/minute flowmeter with control valve, one 1 gallon/minute flowmeter, one pressure gauge, one digital temperature indicator with type T selector switch, differential manometer with manifold, fill and drain valves, ground fault circuit breaker with pilot light, circulating water pump, microprocessor-based temperature controller with dual digital displays, type T thermocouple input and solid state relay, three valves, and deaerator. The system incorporates a thermal protection

system which shuts down the trainer if the thermocouple is broken or if the temperature exceeds the system maximum temperature setpoint.

The demonstrator is constructed of a 14-gauge furniture stock steel enclosure finished in instrument tan texture. The control panel shall be 11-gauge furniture stock steel finished in instrument white enamel. Provided is a cord rack for the power cord, water input and exit quick disconnect ports. Two legs are provided with levelers so the unit can be table top mounted.

Nomenclature is silkscreened in black KEM enamel.

This unit is provided with a complete Operating Instruction Manual and Experiment Manual.



**Model H-6875** Steam to Water heat Exchanger  
Dimensions: 36"H x 36"W x 20"D, Shipping Weight: 300 lbs.

### Experiment Capabilities

- Effect of coolant flow velocity and the number of tube passes on pressure drop.
- Effect of flow velocity and the number of tube passes on the overall heat transfer coefficient.
- Heat exchanger effectiveness due to the increasing number of tube passes at constant flow rates.
- Nucleate boiling demonstration.
- Filmwise condensation demonstration.
- Saturation pressure/temperature relationship for H<sub>2</sub>O at low pressure.

### Services Required

#### Water Source:

1 gal/min maximum

#### Electrical:

120V AC-1 $\phi$ -60Hz

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

**Hampden**  
ENGINEERING CORPORATION