H-6140

Double Effect Evaporator Demonstrator

Purpose

The Hampden **Model H-6140** Double Effect Evaporator is an industrial type unit which demonstrates the fundamental principles of a multi-effect type evaporator. The unit can also be used to demonstrate the fundamental principles of a single effect evaporator.

Description

Steam is condensed in the first element and is used to evaporate the feed solution. The condensed steam can be discharged to the laboratory drain or used to preheat the feed solution. The vapor output of the first effect is used to heat the second effect. The vapor product of the second effect is sent to a condenser and combined with the liquid product leaving the second effect. The remainder of the output of the second effect is sent to the laboratory sump tank. The unit can be operated as a continuous or as a continuous-batch evaporator. This unit is completely self-contained.

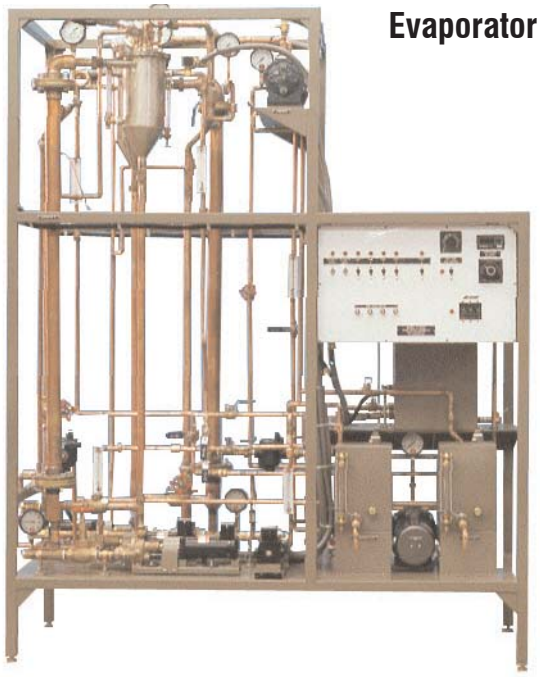
The unit is supplied with a comprehensive instruction manual which includes: (1) operating instructions; (2) equipment data; and (3) theoretical background of the evaporator process.

All components are mounted on a steel frame constructed out of square mechanical tubing. All steel surfaces are finished with oven-baked enamel. The control instrumentation is located on a control panel which is surface mounted to the steel frame. This control panel is finished in a white oven-baked enamel. The control instrumentation is clearly identified by means of a silkscreened legend.

Services Required

Electrical Service:

120/208VAC-3ϕ-5 wire-30Amp



MODEL H-6140 Double Effect Evaporator Demonstrator shown without insulation
Dimensions: 100"H x 72"W x 32"D - Shipping Weight: 1500 lbs.

Experimental Capability

- Perform mass and energy balances on the evaporator.
- Determine the heat transfer rates between the various fluid streams.
- Determine the effect of preheating the feed solution.
- Determine efficiency of the evaporator.
- Determine the effect of operating the evaporator with different feed configurations and number of effects.
- Study evaporator control techniques.
- Determine the effect of pressure and flow on the operation of the evaporator.
- Effect of level on the operation of the evaporator.

Equipment Specification

Evaporator length (each tube)	1400 mm
Evaporator pressure range	300 mm Hg - absolute to 80 kPa gauge
Maximum steam consumption	15 kg/hr
Maximum steam pressure	200 kPa gauge
Maximum evaporation rate	10 kg/hr
Feed solution vessel capacity	60 liters
Feed solution pump	20 l/hr. max
Feed solution flow meter	1 to 20 l/hr
Feed solution preheater coil	2 to 3 kW
Product collection vessel	10 liters
Condensate collection vessel	10 liters
Recirculation pump	50 l/hr max
Recirculating flowmeter	2 to 50 l/hr
Condenser area	0.2 m^2
Cyclone separator	1 for each evaporator

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

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