

H-6145

Rising Film Evaporator

Purpose

The Hampden **Model H-6145** Rising Film Evaporator is an industrial type unit which demonstrates the fundamental principles of a single effect evaporator.

Description

The Hampden Rising Film Evaporator consists of:

- Single effect evaporator
- Cyclone separator
- Condenser
- Feed tank
- Condensate collection tank
- Product collection tank
- Vacuum pump
- Cleaning pump
- Control panel

The liquid to be processed gravity feeds from the feed tank through a flowmeter and manual control valve to the steam heated evaporator. Vapor produced in the evaporator rises and carries a film of concentrated liquid up the tube into the cyclone separator. The cyclone separator separates the vapor and liquid. The liquid goes either back to the evaporator or to the product collection tank. The vapor goes to the water-cooled condenser then to the condensate collection tank.

The entire system can be flushed out with a cleaning solution utilizing the circulating pump and spray nozzles incorporated within the storage tanks.

The control panel incorporates a ground fault interrupting circuit breaker, pump switch, digital temperature indicator, temperature selector switch, vacuum pump switch with outlet receptacle and vacuum gauge.

Specifications

Steel Frame:

Square mechanical tubing with levellers. Unit finished in Instrument Tan

Control Panel Enclosure:

14-gauge furniture stock steel finished in Instrument White

Nomenclature:

3-ply brown/white-core engraving phenolic

Evaporator:

Tube-in-shell 53" (1.36m) high with heat transfer area of 124 in² (0.08m²). The shell is covered with insulation and provided with connections for steam along with steam trap.

Cyclone Separator:

Non-corrosive material

Condenser:

Stainless steel with condenser transfer area of 263 in² (0.17m²). The condenser is covered with insulation and provided with connections for water cooling and vacuum.

Condensate and Product Collection Tank:

Pyrex glass with flanged caps, washdown spray heads, and couplers for sampling, feed and drain valves. 1.3 gallon (5 liter) capacity.

Pyrex Glass Angle Pipe:

Use between evaporator and cyclone

Stainless Steel Pipe:

Used between cyclone and condenser

Feed Tank:

Non-corrosive polypropylene, 10 gallon (37.85 liters)

Flowmeters:

Three

Pressure Gauge:

30 psi (2.04 bar)

Thermocouples:

Type T

Controls:

- Digital temperature indicator
- Temperature selector switch
- Vacuum pump switch
- Pump switch
- Ground fault interrupter circuit breaker

Valves:

- Ball valves
- Needle valves

Circulating Pump:

Wash-down function, 2 GPM (8 LPM) at 20 ft. H₂O

Vacuum Pump

Experiment Capabilities

- Heat Transfer Calculations and Measurement
- Rising Film Evaporator Operations using Liquid Foods
- Effect of Varying Process Parameters, i.e. Temperature, Flow, Vacuum and Recycle Rate
- Liquid Food Concentrates
- Cleaning in Place Procedures

Service Requirements

Electrical:

120V AC 1 ϕ 60Hz

Steam:

40 lbs/hr (18kg/hr)

Water:

3 gal/min (12 l/min)

Waste water drain

Trainer available for operation on any voltage or frequency.

Optional Equipment

Model H-6145-10 Steam Generator

BHP: 1.2

lbs steam/hr: 40

KW: 12

Voltage: 208V 3 ϕ

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

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