SUPERVISED CONTINUOUS DISTILLATION

REFERENCE : MP1011CR

Non contractual photo

SERVICE : 230 V / 50 HZ / SINGLE PHASE: 4 KW. COLD WATER 20 ° C / 3 BAR 1 M3 / H. SEWER.
DIMENSIONS : 1,40 M X 0,65 M X 2,00 M

WEIGHT : 120KG

Principle of operation

Distillation allows the separation of a mixture of compounds having different boiling points. The boiling of the mixture makes it possible to obtain vapors of compositions different from the liquid. Re-condensations and multiple re-evaporations progressively enrich the vapor phase to the most volatile product. The packing present in the column multiplies the contact surface and thus the material transfers. A metering pump for introducing the solution at specific points of the column (1/2 and 2/2 of the height) makes this unit operation continuous. The vapors are condensed and then distributed between the distillate (recovered continuously) and the reflux via a solenoid valve regulated on the column temperature. The residue is also recovered continuously from the bottom of the boiler. The temperatures at the bottom and at the top of the column are measured as well as at the points of introduction of the solution in order to establish the temperature profile.

Educational Objectives :

- Study of the hydrodynamics of the column.
- Influence of the operating conditions on the separation of a binary solution
- Thermal balances.
- Material balance.
- Determination of the number of theoretical plates (McCabe and Thiele, Ponchon and Savart).
- Determination of the number of transfer units

Technical specifications :

- Storage can of the polyethylene feed solution.
- Feeder dosing pump.
- Preheating of feed through the tubular heat exchanger of heavy compounds.
- Continuous boiler in borosilicate glass, electric heating, equipped with minimum safety level and maximum temperature safety.
- Vigorous refrigerant.
- Column in borosilicate glass, two elements of 250 mm with packing.
- Two refocusing trays in 316L stainless steel.
- Inclined condenser in 316L stainless steel.
- Proportional solenoid valve for the regulation of the reflux ratio according to the temperature of the column head
- Two refrigerants of the distillate and residue in stainless steel 316L, one in lost water to cool the distillate and the other cooled by the solution of the can of supply
- Two recipes of distillate and borosilicate glass residue.
- Two containers for receiving the distillate and the polyethylene residue; useful volume 5 liters each.
- 316L stainless steel connection pipes.
- Support frame in 304L stainless steel tubes and aluminum nuts.

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Instrumentation :

- Condenser cooling water supply equipped with a float flowmeter with its control valve and a water circulation controller to stop heating due to lack of cooling.
- Column pressure drop measurement by differential pressure measurement
- Control and control cabinet, IP55, equipped with emergency stop, operating buttons and the following interfaces:
- Controllers controlling boiler heating and proportional reflux valve
- Touchscreen display of temperatures and pressure drops.
- Remote control by Autolink software ethernet link between PC and control cabinet