



1. top product condenser, 2. manometer (column differential pressure), 3. valves (reflux ratio), 4. cooling water flow meter, 5. sieve plate or packed column, 6. evaporator, 7. switch cabinet with displays and controls, 8. top product tank, 9. phase separation tank, 10. water jet pump

Features:

- Discontinuous rectification
- Comparison of packed and sieve plate column
- Vacuum mode possible
- Plates in sieve plate column removable

Distillation is used to separate liquid mixtures made up of individual liquids that are soluble in one another. Rectification refers to distillation in a counter-flow. Ethanol/water is recommended as the liquid mixture for the Tesca Discontinuous Rectification 32368. The liquid mixture is added to the evaporator (bottom) tank. The mixed vapour produced moves upwards in the column. The mixed vapour contains a higher concentration of the component with the lower boiling point (ethanol). It leaves the top of the column and is condensed using a condenser and a phase separation tank. Part of the condensate is collected in a tank as product while the rest is fed back into the column. Here, on its way downwards, it undergoes further heating and material exchange with the rising mixed vapour. This exchange causes the vapour phase to become richer in ethanol and the liquid phase to become richer in water. The liquid phase moves to the bottom where it is collected.

A sieve plate column and a packed column are available. The packed column is filled with Raschig rings. The reflux ratio is adjusted using valves.

Note: Specifications are subject to change.

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Relevant measured values are recorded by sensors and displayed digitally on the switch cabinet. The evaporator is adjusted using a PID controller. A large, clear process schematic on the switch cabinet makes it easy to assign all the process variables. The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

Specifications

- Discontinuous rectification with packed and sieve plate column
- Interchangeable columns
- Sieve plate column with 8 plates
- Packed column with Raschig rings
- Vacuum mode possible with water jet pump
- Electrically heated evaporator
- Tank for top product
- Condenser and phase separation tank for top product
- All tanks made of high quality glass and stainless steel
- Adjustment of reflux ratio using valves
- 8 Temperature measuring points per column

Technical Specifications

Columns: internal diameter: 50mm, height: 765mm
Water jet pump: final vacuum: approx. 200mbar

- Tanks
 - Top product: approx. 2000mL
 - Phase separation: approx. 500mL
- Evaporator
 - Power output: 0...4kW
 - Tank: approx. 10L
- Heat transfer surface
 - Top product condenser: approx. 0,04m²
- Measuring ranges
 - Temperature: 13 x 0...150°C
 - Reflux ratio: 0...100%
 - Cooling water flow rate: 30...320L/h
 - Column differential pressure: 0...60mbar
 - System pressure gauge: -1...0,6bar

Experiments

- Investigation and comparison of sieve plate and packed columns
 - In discontinuous mode
 - In vacuum mode
 - With different reflux ratios
 - With different numbers of plates
- Determination of concentration profiles
- Determination of temperature profiles
- Pressure loss over the column

Requirement

- 220-240V, 50Hz, 3 phases or 380-440V, 50Hz, 3 phases
- Cold water connection: 500...1000L/h