



Features

- Separating a CO₂/air mixture by absorption in counter-flow
- Glass column with packed bed
- Safe operation due to use of water as the solvent and non-hazardous gases
- Regeneration of solvent by vacuum
- Gas analysis with hand-held measuring unit

Tesca Gas Absorption Unit is used to remove one or more gaseous components from a gas flow using a solvent.

First of all, a CO₂ and air gas mixture is produced. It is possible to adjust the mixing ratio using valves. The flow rates of the gas components are displayed.

A compressor delivers the gas mixture into the lower section of the absorption column. In the column, part of the CO₂ is separated in the counter-flow with the solvent. Water is used as the solvent. The CO₂ is absorbed by the downward flowing water. To separate the absorbed CO₂, the charged water is then fed from the lower section of the absorption column into a desorption column. As the pressure is reduced and the temperature is increased, the solubility of the CO₂ falls. A heater heats the water. A water jet pump generates negative pressure in the desorption column and causes the CO₂ gas to be emitted from the water. A pump then delivers the regenerated solvent back into the absorption column.

The water temperature can be controlled. Flow rate, temperature and pressure are continuously measured. The two-section column is equipped with connections to determine the pressure losses. The pressure loss in the respective sections can be displayed via two U-tube manometers. To evaluate the success of the process, the trainer includes outlets for taking gas and liquid samples. The gas samples can be analysed using the hand-held measuring unit supplied.

Note: Specifications are subject to change.

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Specifications

- Separation of CO₂/air mixture by absorption in counter-flow with water
- Production of gas mixture using CO₂ from compressed gas cylinder and ambient air
- Adjustment of mixing ratio using valves
- Compressor for delivering the gas mixture into the absorption column
- Glass absorption column (packed bed) and desorption column
- Continuous solvent regeneration in circuit with desorption column under vacuum
- 1 pump for desorption column and 1 pump for returning solvent to absorption column
- Water temperature control with heater and refrigeration system

Technical Specifications

Absorption column

- Height: 2x 750mm, internal diameter: 80mm

Desorption column

- Height: 750mm, internal diameter: 80mm

2 pumps (absorption/desorption)

- max. flow rate: 17,5L/min
- max. head: 47m

1 pump (cooling)

- max. flow rate: 29L/min
- max. head: 1,4m

Compressor

- max. positive pressure: 2bar
- max. flow rate: 39L/min

Measuring ranges

- Flow rate:
- Air: 0,2...2,4Nm³/h
- Solvent: 50...600L/h
- CO₂: 0,4...5,4L/min
- Temperature: 1x 0...80°C, 2x 0...60°C
- Pressure: 1x 0...2,5bar, 1x -1...0,6bar
- Differential pressure: 2x 0...250mmWC
- CO₂-content: 0...100vol%

Experimental Capabilities

- Investigation of the absorption process when separating gas mixtures in a packed column
- Determination of pressure losses in the column
- Representation of the absorption process in an operating diagram investigation of the variables influencing the effectiveness of absorption

Required Services

- Electric Supply 230 V AC, Single Phase, Earthed.
- Water supply: 10L/min @ 1bar
- CO₂ Cylinder with pressure regulator
- Vent piping to outside laboratory
- Titration glassware for liquid analysis Separate drain tank for treatment of effluent