

PILODIST®

laboratory & process technology

PILODIST® VLE 110



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VAPOUR-LIQUID-EQUILIBRUM Apparatus VLE 110

The vapour-liquid phase equilibria of mixtures with two or more components are an essential basis for the determination of the required number of theoretical separation stages and other distillation conditions. The model VLE 110 is designed for operation under vacuum (option A) or at overpressure up to 3 bar absolute (option B) with a charge volume of approx. 35 mL and temperatures of up to 250°C.

An electrical immersion heater, made of quartz-sand material is located in the central bottom part of the glass apparatus effecting evaporation. The reflux circulation streams are intensely stirred in a mixing chamber which ensures a quick adjustment of the equilibrium. Sample take-off of both phases (liquid and vapour) can be realized either by automatically controlled valve plungers via solenoid valves or can alternatively be taken from the circulation streams via a gas-tight syringe which is also part of the delivery. An additional sampling port offers the possibility to take gaseous samples of the vapour phase which is a special advantage for mixtures with miscibility gaps.

The system is delivered with a micro processor based control device for precise and reliable work.

Latest redesign 2015 with immersion heater for evaporation chamber

Technical Data:

Operation Temperature:	250° C
Operation Pressure:	-ATM, -vacuum 1000 – 1,0 mbar -overpressure up to max. 3000 mbar abs.
Charge Quantity per measurement:	approx. 100 ml
Mains Supply:	230 V, 50/60 Hz
Dimensions (w x h x d):	0.65 x 0.97 x 0.55 m

The apparatus consists of:

- 1 mounting frame for all unit parts, including all holders
- 1 universal glass apparatus, complete with silvered vacuum mantle, cooler, evaporation and mixing chamber and vacuum-tight screwing for sample take-off by means of the syringe
- 2 valve plungers for liquid and vapour phase
- 2 solenoid coils for activation of sample take-off valves
- 1 electrical immersion heater, made of quartz-sand material, for evaporation chamber
- 1 electrical stirrer drive for mixing chamber
- 10 final receivers with screw caps
- 1 filling funnel with teflon cock
- 1 temperature sensor Pt-100, diameter 6 mm, heating chamber, complete with connection cable and plug
- 1 temperature sensor Pt-100, diameter 6 mm, vapour phase, complete with connection cable and plug
- 1 Phase-equilibrium control device DCD-VLE 110
with modern micro-electronics, offers high operating comfort, safety and reliability.
The control device offers the following functions:
 - display of the set value and actual value
 - input of the parameters via operation software
 - control of the rotating temperature
 - control of the heating mantle and line heating
 - operation of the take-off valve - manually -
 - control of the vacuum (option vacuum equipment)
 - control of the pressure (option pressure equipment)
- 1 Laptop with operation software

Option A:

Accessories for operation under vacuum, consisting of:

- 1 measuring probe 1000 – 1,0 mbar, made of stainless steel, independent of the kind of gas
- 1 vacuum pump, 2 m³/h at 50 Hz
- 1 vacuum throttle- and solenoid valve
- 1 gas-tight syringe for sample take-off, 1 ml
- 1 feed burette, 250 ml, graduated
- 1 vacuum cold trap

Option B:

Accessories for operation under pressure up to 3 bar absolute, consisting of:

- 1 measuring probe 3000 mbar, made of stainless steel, independent of the kind of gas
- 1 pressure throttle- and solenoid valve
- 1 overpressure safety valve
- 1 switch over ball valve

Option C:

Accessories for operation of waxy products consisting of:

- 1 heating tape for lines
- 1 heating mantle with integrated temperature sensor Pt-100

Option D:

Sheathing of the complete system:

The complete system to be mounted on an open table with 4 wheels and complete cover of the system (except controllers) in polycarbonate with 2 front doors, adapter to ventilation