

实验室及中试规模
薄膜与分子(短程)蒸馏设备



KDL 5 系列实验室蒸馏设备

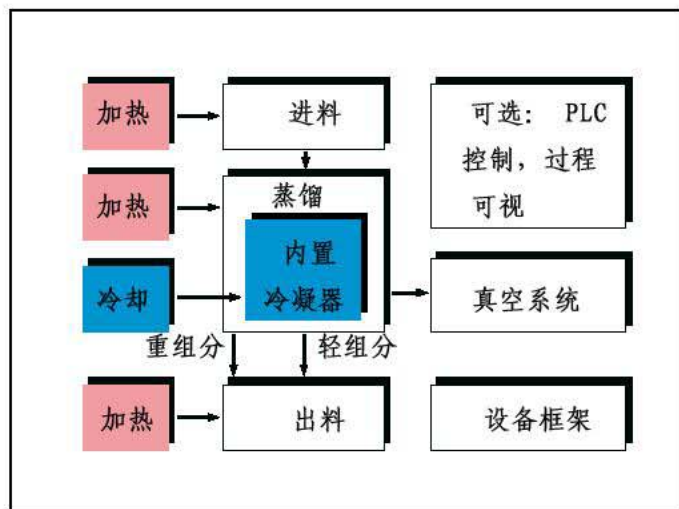
模块化实验室设备，灵活应用于各种蒸馏工作，单级或多级

模块化的KDL5系列蒸馏设备可以进行灵活的选配；世界上已有几百套此规格的设备对不同物料进行着蒸馏实验。设备模块已在实践中证实有效，并且技术不断提高。对于任何一个项目，认真地选择相应的模块配置可确保此套实验装置的可靠性和操作的便捷。

所有KDL5设备的主要部件都是硼硅玻璃制造的带有内置冷凝器的短程蒸发器，或是还有外置冷凝器的薄膜蒸发器，蒸发面积均为0.05 m²。蒸发器配有辅助设备以实现连续的蒸馏操作。对于高粘度甚至常温下为固体物质的蒸馏，设备与物料接触的部位都可以选配为可加热型。



两级KDL5实验室分子蒸馏装置带有一级薄膜与一级短程蒸馏装置



模块化的KDL5实验室蒸馏装置可以由薄膜蒸发器与短程蒸发器共同组成的多级蒸馏设备。

上图显示的即为两级设备，在物料进入短程蒸发器前，先由薄膜蒸发器脱除挥发性物质（溶剂等）。

KDL5实验室蒸馏设备的模块化组成

KDL 5实验室蒸馏设备主要技术指标

设备主体	短程蒸馏器 薄膜蒸发器
蒸发面积	0.05 m ²
加热范围:	蒸发器部分, 最高至 350°C 重组分出料, 最高至 250°C 轻组分出料, 最高至 200°C
一般进料量	0.5 - 1.5 kg/h
操作压力	短程蒸馏器 0.001 mbar 薄膜蒸发器 最低 1 mbar
进料系统	计量容器 齿轮泵 计量泵
重组分及轻组分出料系统	玻璃收集瓶 截流计量瓶 样品旋转收集装置 齿轮泵
真空系统	旋片泵 油扩散泵
加热和制冷系统	多种选项, 视温度范围要求和工作效率而定
设备支架	台式支架 可移动轮式支架



KDL 5 - 配有台式支架



KDL 5 - 配有可移动轮式支架

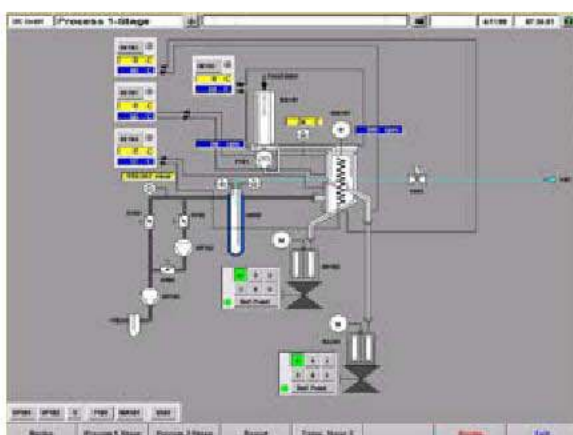
自动蒸馏装置，可设置连续蒸馏收集5组轻重组分样品，最适合矿物油重组分蒸馏工作

有时我们需要进行重复的蒸馏工作，比如绘制蒸馏曲线，就要取得物料在不同蒸馏温度下对应的分离比（馏出物与进料料之间的比例）。蒸馏曲线在矿物油加工业非常重要，分子蒸馏设备也广泛地应用于矿物油加工行业以分离得到高沸点的矿物油重组分。



KDL 5 CADi, 计算机辅助自动蒸馏装置

KDL 5 CADi, 计算机辅助自动蒸馏装置是在实验室进行反复蒸馏工作的理想设备。蒸馏次序由PLC控制，通过计算机控制连续执行最多五套不同的蒸馏工作参数。



KDL 5 CADi, 通过鼠标和显示器控制

自动蒸馏的次序一般是：

- 将样品收集指向“废液收集管”
- 设备加热至第一馏分设定的工作温度
- 将样品收集指向“第一馏分收集管”
- 蒸馏保持设定的时间，得到轻重两种组分
- 将样品收集指向“废液收集管”
- 设备加热至第二馏分设定的工作温度

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自动蒸馏按次序完成后，样品收集装置中即分别得到了5组轻组分样品和5组重组分样品用以进行分析。系统同时记录并可打印出所有的蒸馏工作参数。

Series KDL 5 Laboratory Plants

modular laboratory plants • flexible for all distillation tasks • single or multi-stage

Our modular KDL 5 plants offer unmatched flexibility, with several hundred plants distilling a huge variety of substances all over the world. The modular concept includes a large range of proven components, which are continuously improved. Each project carefully selects the components to ensure a laboratory distillation plant that will run reliably and is easy to operate.

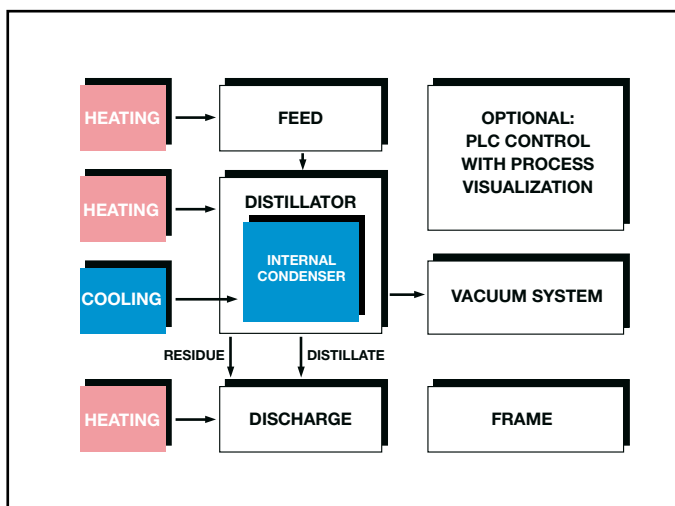
The main component of all KDL 5 plants is the Short Path Distillator with an internal condenser made of borosilicate glass, or

the Thin Film Evaporator with an external condenser. Both types are equipped with an evaporator surface area of 0.05 m².

The secondary components required for continuous operation are compatible to these distillators and evaporators. For the distillation of highly viscous or even solid (at ambient temperature) products, the components which are in direct contact with the products are also available in heatable versions.



Two-stage laboratory plant, series KDL 5, with Thin Film Evaporator and Short Path Distillator



The modular KDL 5 laboratory plants can also be assembled using combinations of Thin Film Evaporators and Short Path Distillators – i. e. for multi-stage plants.

In the two-stage plant shown above, a Thin Film Evaporator strips off the light volatile fraction (solvent) before the main fraction is separated from the heavy boiling residue in the subsequent Short Path Distillator stage.

Components of the KDL 5 modular laboratory plant

Main features of the KDL 5 laboratory plants

Main components	Short Path Distillator Thin Film Evaporator
Evaporation surface area	0.05 m ²
Heating range: Evaporation area	up to 350°C
Residue discharge	up to 250°C
Distillate discharge	up to 200°C
Typical feed rates	0.5 - 1.5 kg/h
Operating pressure	
Short Path Distillator	from 0.001 mbar
Thin Film Evaporator	from 1 mbar
Feed systems	Dosing vessel Gear pump Dosing pump
Discharge systems for distillate and residue	Glass bulb Cut measuring vessel Sample collecting carousel Gear pump
Vacuum systems	Rotary vane pump Oil diffusion pump
Heating devices and heating / cooling devices	Large selection, depending on temperature range and required capacity
Racks	Table rack Mobile floor rack



KDL 5 laboratory plant - Table rack version



KDL 5 laboratory plant - Mobile floor rack version

KDL 5 CADi Laboratory Plant (Computer Aided Distillation)

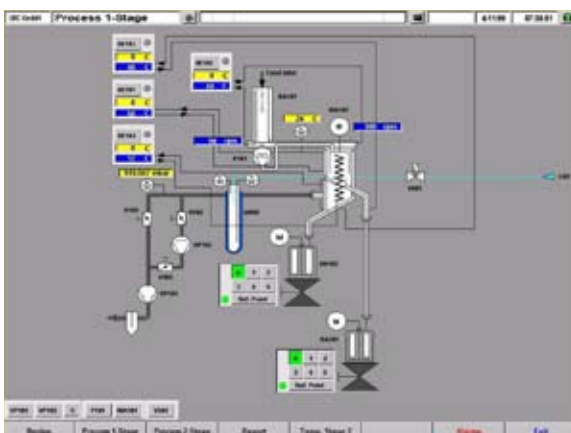
automated distillation series • up to 5 distillate and residue samples • suitable e.g. for distilling mineral oil residues

Routine distillation processes are performed in some areas of process industry, such as determining distillation curves where the cut ratio (the ratio of the distillate quantity to the feed quantity) is shown as a function of the distillation temperature. Distillation curves are important for process management in the mineral oil industry, where Short Path Distillation plants are widely used for the distillation of (high boiling) vacuum residues.



KDL 5 CADi for automated routine distillations

The KDL 5 CADi Short Path Distillation lab plant is ideal for automated distillation processes. A PLC system controls the distillation sequence, with data input and output for up to 5 sets of distillation parameters done by a PC.



KDL 5 CADi system operation via mouse and monitor

The process sequence of the automatic program includes:

- Positioning the sample collecting carousels to “intermediate runs”
- Heating the distillator up to the operating temperature for the first cut
- Positioning the sample collecting carousels to “samples No. 1”
- Collecting distillate and residue in sample cups for a set period of time
- Positioning the sample collecting carousels to “intermediate runs”
- Heating the distillator to the operating temperature for the second cut, etc.

After termination of the automatic sequence, the sample collecting carousels contain 5 distillate samples and 5 residue samples that are used for analytical evaluations. The distillation parameters are recorded by the plant operating system and printed out.

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产品与服务

作为技术合作伙伴，我们为广大客户提供热敏性物质的蒸馏方案；我们所提供的薄膜蒸发和短程蒸馏技术可以实现在低至0.001mbar下进行蒸馏操作。

UIC在真空蒸馏技术方面向客户提供

- 项目可行性调研
- 在UIC技术中心进行实验室和中试规模的蒸馏试验
- 基本工程技术支持
- 为科研、中试、工业生产递付交钥匙工程的设备
- 设备的安装、调试及工工优化
- 设备的检漏、保养和维修
- 配件服务
- 通过我们全世界范围的代理商网络向客户提供咨询和支持工作

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- 德国UIC - 真空设备专家
- 薄膜蒸发与短程蒸馏设备的功能
- 薄膜蒸发与短程蒸馏设备的应用
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