NORMAG LABOR- und PROZESSTECHNIK

NORMAG teaching unit - continuous and batch rectification

- **NORMAG design for high reproducibility and efficiency**
- **More modular, compact design, convenient for training laboratory and technical centres**
- **Quick and easy conversion between continuous and batch mode is possible**
- **Customer-specific design and training**
- **Applications in training:**
  - **understanding rectification processes**
  - **controlling rectification processes**
  - **specific training for rectification processes**
  - **scale-up**
  - **start-up and shutdown**
  - **optional PLS system operation**

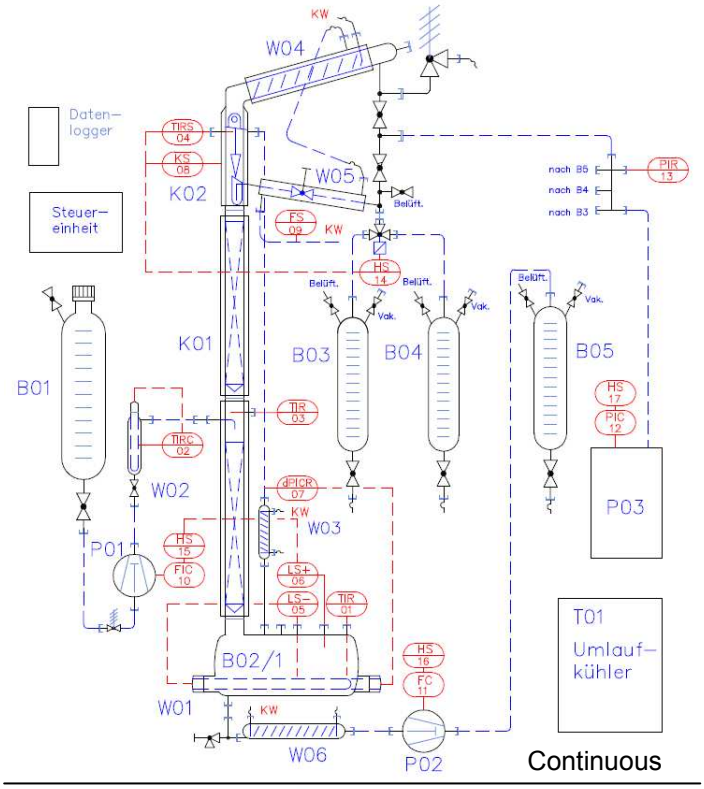
Rectification is the most widely used separation process in the chemical and pharmaceutical industry and is therefore also a central point for education and training.

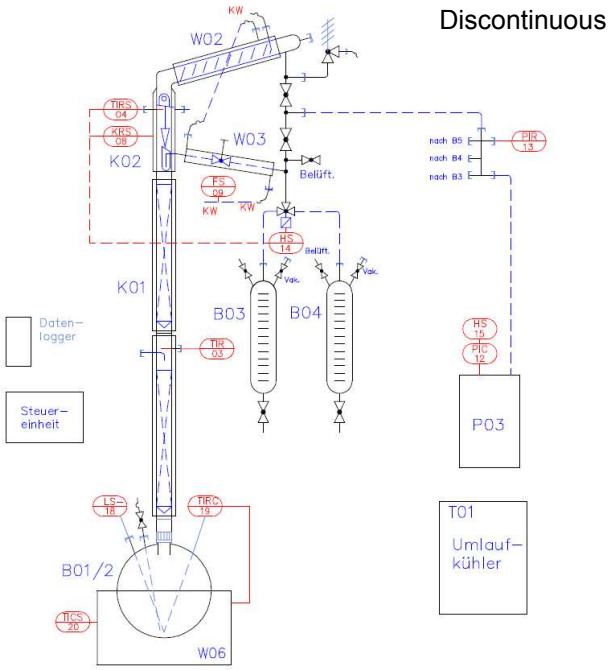
NORMAG has designed a modern rectification apparatus specially for these purposes, which enables efficient and compact experiments to be performed in both batch and continuous modes. The plant is adapted to the specific needs of the training. This means, for example, that a wide range of common column types can be used, all of which are optimised and characterized by **NORMAG** in process technology terms. Customer-specific data acquisition and plant control via the PLS are also possible.

The special design ensures comprehensive, hands-on training, from a basic understanding of rectification work to configuration and operation of the PLS.

Auf dem Steine 4 · D-98693 Ilmenau · www.normag-glas.com
Tel.: +49 (0) 3677 2079 0 · Fax: +49 (0) 3677 2079 20 · info@normag-glas.de

NORMAG teaching unit - continuous and batch rectification





Process description:

The two images show the plant in both the possible configurations . The design makes it possible to change to the other operating mode within the shortest possible time. Only a few plant components need to be replaced. Depending on the operating mode, the mixture is separated and evaporated in container B01/2 or B02/1. Steam and condensate encounter each other in column K01 in the countercurrent. Various packing or packages can be installed in column K01 to increase separation efficiency. The steam is fully condensed in condenser W04 and flows back into the top of column K02, where it is split by a pendulum hopper between column K01 and distillate receivers B03 and B04.
In continuous operating mode, the sump can be removed and cooled with B06 and routed into receiver B05. The special **NORMAG** design permits distillation operation using a very low vacuum over a wide feed area.

Typical applications:

- Feasibility studies
- Training

Options:

- Vacuum pump stand
- Process control system with PC

Technical specifications:

Dimensions:	2300 x 1600 x 550 mm (W x D x H).
limitations	20 - 200 °C
Volume	2 – 20 litres
Pressure range	-1 / +0.5 barg
Energy supply:	
Electrical power	230V / 50Hz
Vacuum (optional)	up to 2 mbar

Auf dem Steine 4 · D-98693 Ilmenau · www.normag-glas.com
Tel.: +49 (0) 3677 2079 0 · Fax: +49 (0) 3677 2079 20 · info@normag-glas.de