

## NORMAG continuous liquid-liquid extraction unit

- **NORMAG** design for high efficiency of mixing chambers down to very small column diameters
- small quantities of extraction media necessary
- scale-Up design according to Dr. Pilhofer
- modular design, various dimensions can be offered
- options
  - extraction media regeneration by rectification
  - process control
  - mobile unit
- Applications:
  - laboratory and experimental hall
  - scale-up experiments
  - teaching units

An important separation technology in the chemical and pharmaceutical industry is the liquid-liquid extraction, especially for temperature sensitive and distillative not separatable substances. For the extractive multistage separation are preferable extraction columns used.

**NORMAG** has therefore a high efficient and scale-up suitable design for an agitated extraction column according to Dr. Pilhofer with a free area of appr. 40 % and up to 2000 rpm developed. Due to the special design are vary small column diameters down to 30 mm possible. In addition the system has a high efficiency and requires only small quantities of extraction media.

As illustrated below a very compact unit design together with a downstream rectification is possible. These characteristics of the agitated extraction column are ideal for the use as teaching unit as well as in laboratories and experimental hall.

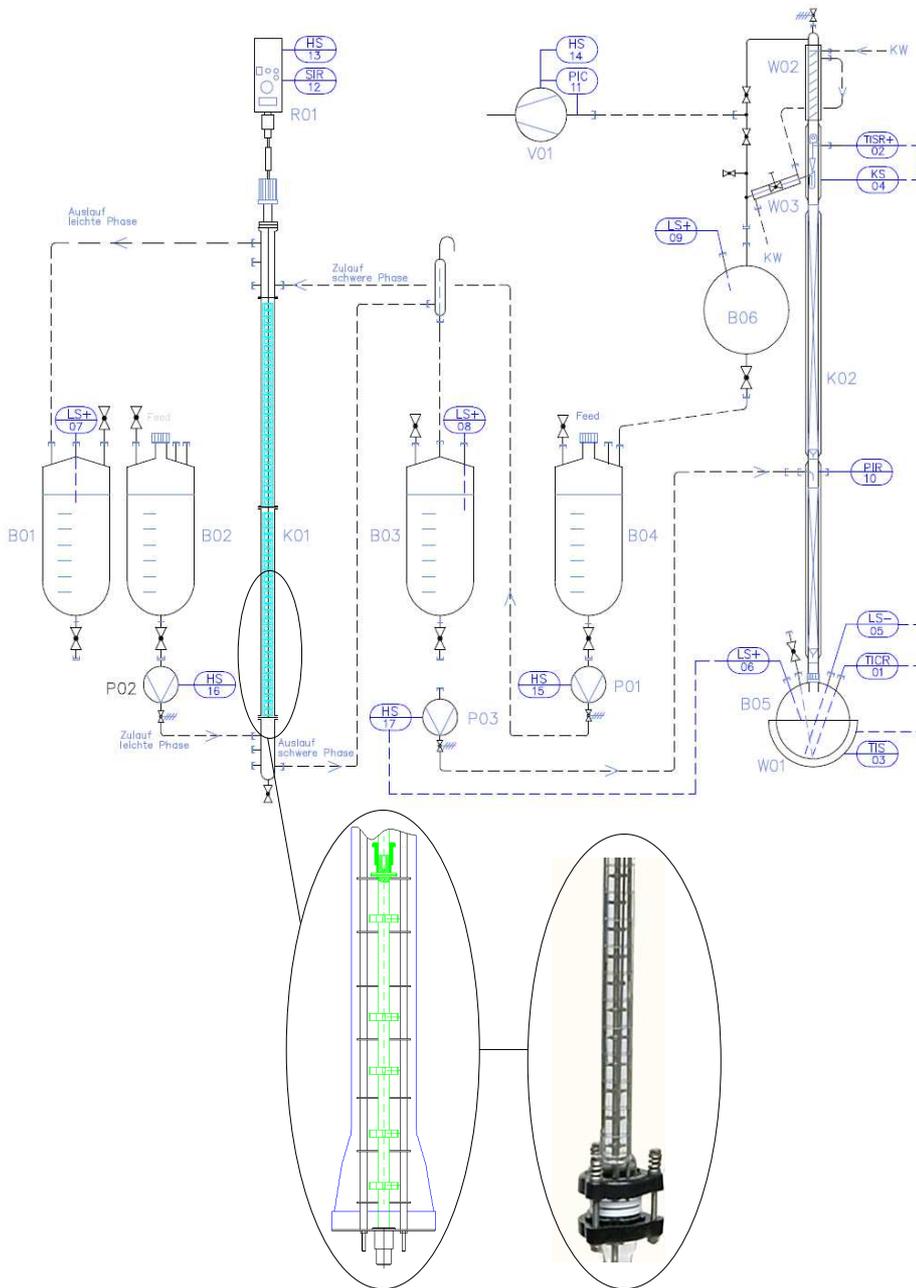


## NORMAG continuous liquid-liquid-extraction unit

### Process description:

The feed mixture will be filled into vessel B02 and pumped via P02 in the sump of the extraction column K01. The heavier extraction media will be added from vessel B04 on top of the column and flows countercurrent to the light phase through the column. The rotating discs of the agitator column disperse one phase in the other intensively. The resulting large phase interface area improves significantly the transfer of the extractant from the feed mixture. The raffinate as light phase will flow from the top of the column into the collector vessel B01, while the loaded extraction media flows via the sump of the column K01 into the collector vessel B03.

The enriched extraction media will be regenerated in the downstream rectification column. Therefore the solution is pumped with P03 in the rectification column K02 with the evaporator W01, condenser W02 and vacuum pump V01. The purified extraction media as the distillate will be collected in the vessels B06 / B04. The higher boiling extraction product will be collected in the distillation sump B05 and can be taken off after finishing the distillation process. For temperature sensitive products is a corresponding concept of the evaporator section an option.



### Technical specification:

dimension:	2.300 x 2.100 x 550 mm (H x B x T)
Vessels	10 – 200 Liter
Temperature range	20 - 200 °C
pressure range	-1 / + 0,5 barg
<b>media:</b>	
power	230/400 V / 50Hz
cooling media	water, glycol