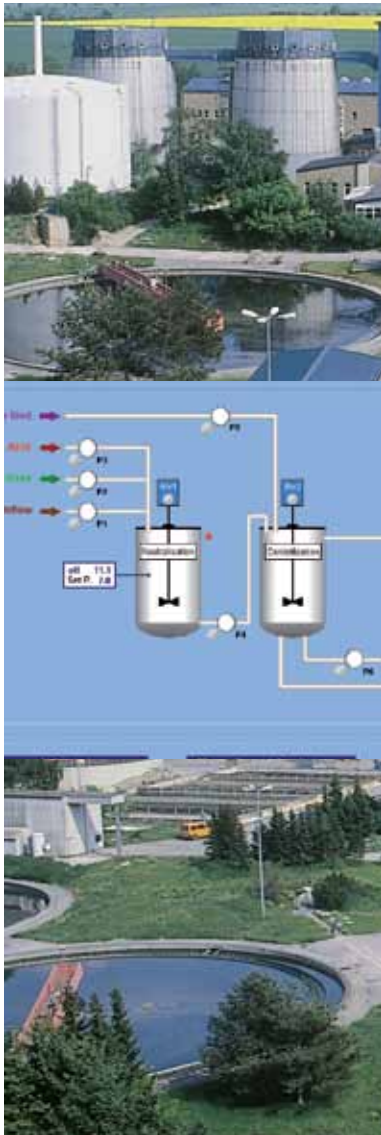


Biodegradability

Lab-scale wastewater treatment plant for water analysis



WASTEWATER

behrotest® lab-scale wastewater treatment plants

Lab-scale purification plants are used for wastewater analysis in activated sludge simulation tests. The design and test method are described in

- the **ISO standard 11733:2004**, "Water quality - Determination of the elimination and biodegradability of organic compounds in an aqueous medium - Activated sludge simulation test".

In Germany, identical lab-scale plants are also a technological requirement for wastewater tests in accordance with

- **DIN DEV 38412 L 24** "Bio-assays (group L): Determination of biodegradability by use of special methods" and

- **DIN DEV 38412 L 26** "Bio-assays (group L): Surfactant biodegradation and elimination test of water

simulation of municipal wastewater treatment plants". And finally, the OECD standard test

- **OECD 303A** "Simulation Test - Aerobic Sewage Treatment: Activated Sludge Units" is carried out with the help of two coupled lab-scale wastewater plants.

These standardised methods are aimed at testing the elimination and/or eliminability of potentially harmful chemical substances through biodegradation. This results in knowledge on wastewater treatment in municipal plants or corporate purification plants under similar circumstances.

All behrotest® lab-scale wastewater treatment plants comply with the requirements of the international standards for biodegradability tests.

The basic version: behrotest® KA 1 lab-scale wastewater treatment plant

The lab-scale wastewater treatment plant KA 1 is the basic version of the behrotest® lab-scale wastewater treatment plants and thus the basis for all model variants.

It consists of:

- Aeration and separator vessel of borosilicate glass 3.3,
- Air lift pump, also made of borosilicate glass 3.3, to return sewage sludge from the settling vessel to the aeration vessel,
- Diaphragm pump,
- Flow meters to introduce air into the aeration vessel and to control the air lift pump,
- Hose pump, 0.2 ... 2 l/h to transport the wastewater,
- Storage tank, 30 l, for wastewater influent
- Collecting tank for effluent, 30 l .

All parts are mounted on a space-saving, practical and sturdy trolley.

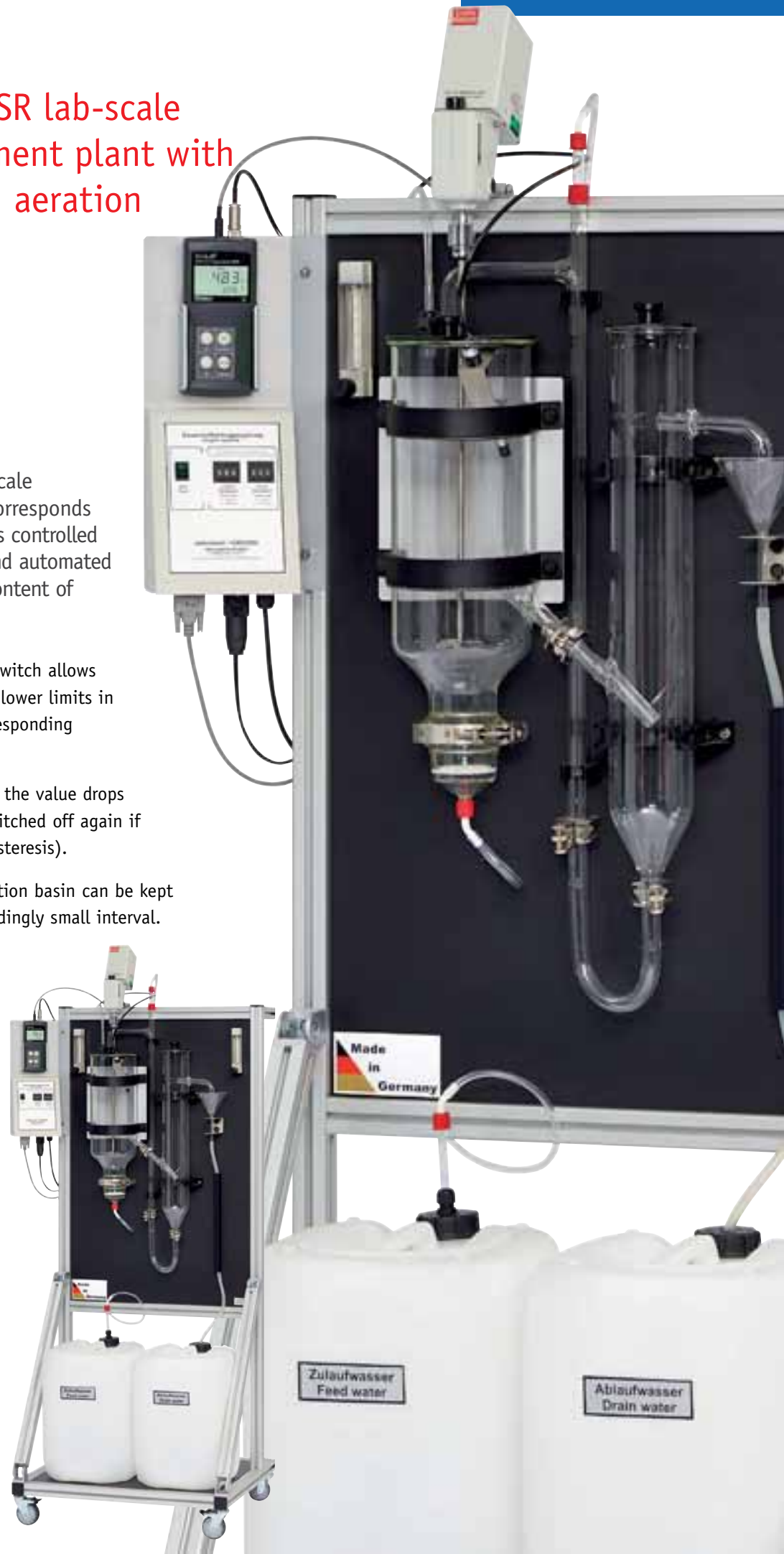
behrotest® KA 1



behrotest® KA 1/SR lab-scale wastewater treatment plant with controlled oxygen aeration

The behrotest® KA 1/SR lab-scale wastewater treatment plant corresponds to the KA 1 model, but also has controlled oxygen aeration for low-cost and automated tests to optimise the oxygen content of wastewater treatment plants.

- The behrotest® GWS 200 limit switch allows a free setting of the upper and lower limits in a range from 0 ... 200 %, corresponding to 0 ... 19.9 mg/l
- The air supply is switched on if the value drops below the lower limit and is switched off again if the upper limit is exceeded (hysteresis).
- The oxygen content in the aeration basin can be kept almost constant by a correspondingly small interval.





behrotest® KLD 4 lab-scale wastewater treatment plant with denitrification stage

The behrotest® KLD 4 lab-scale wastewater treatment plant is identical to the KA 1. However, it has an additional denitrification stage.

The activated sludge is kept largely in the anaerobic range in this preliminary stage. This denitrifies the sludge and certain pollutants in the wastewater can be better degraded.

The behrotest® KLD 4 includes all glass parts of borosilicate glass 3.3, pumps to convey the water and for aeration, flow meters and storage tanks. It also has two stirrers that prevent any unwanted sludge sedimentation in the denitrification stage and aeration vessel together with the aeration.

The operator can set the pump and pause times to return the sludge to the denitrification stage via a control panel. Times between 1 and 99 minutes can be selected. Naturally, all of the pumps in the lab-scale wastewater treatment plant are infinitely variable. This allows the flow rates to be adjusted to the relevant test conditions.

behrotest® KLD 4/SR lab-scale wastewater treatment plant with denitrification stage and controlled oxygen aeration

The behrotest® KLD 4/SR lab-scale wastewater treatment plant corresponds to the behrotest® KLD 4, but also has the same controlled oxygen aeration as the behrotest® KA 1/SR lab-scale wastewater treatment plant.

behrotest® KLD 4 N lab-scale wastewater treatment plant with denitrification stage

The behrotest® KLD 4 N lab-scale wastewater treatment plant is identical to the behrotest® KLD 4, but also has the option of a continuous sludge return.



behrotest® KLD 4/SR



behrotest® KLD 4 N

behrotest® KLD 4 N/SR lab-scale wastewater treatment plant with denitrification stage and controlled oxygen aeration

The behrotest® KLD 4 N/SR lab-scale wastewater treatment plant corresponds to the behrotest® KLD 4 N, but also has the same controlled oxygen aeration as the behrotest® KA 1/SR lab-scale wastewater treatment plant.



behrotest®
KLD 4 N/SR

behrotest® lab-scale wastewater treatment plants to user specifications

behrotest® lab-scale wastewater treatment plants are also used outside standardised routine wastewater analysis applications.

Preliminary neutralisation stage

If fitted with an upstream neutralisation vessel, the pH value of the crude wastewater can be corrected if necessary.

Temperature control

In versions with double-walled vessels the user can specifically investigate the temperature and its effect on biodegradability, for example.

Individual vessel sizes

The user can also order their behrotest® lab-scale wastewater treatment plant with vessel sizes according to their own specifications on request.



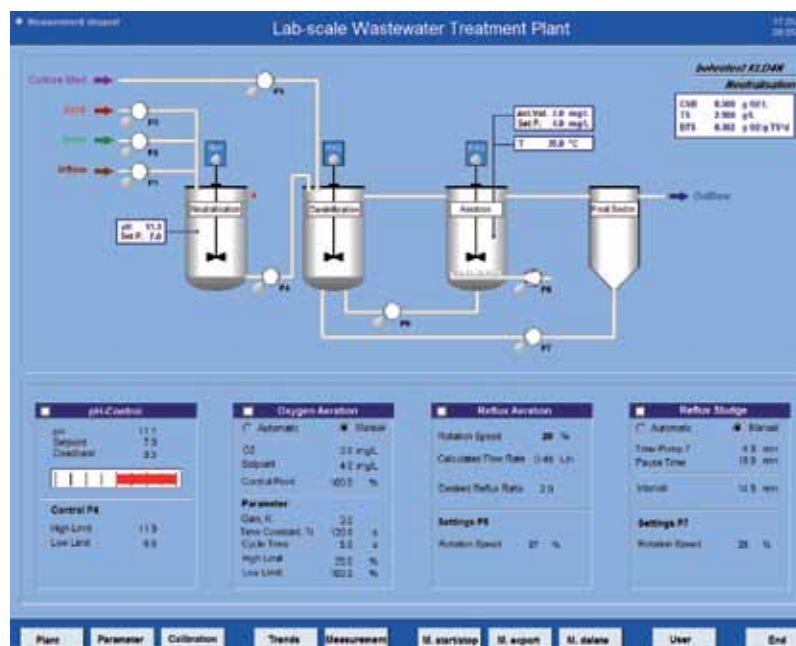
Special design

Automation with a process control system software

behrotest® lab-scale wastewater treatment plants can be fully automated on a PC with a process control system software. The soft PLC performs the control, regulation and interlock functions such as pump start, pH-value control, controlled oxygen input, interval-based sewage sludge return. The setpoints for the return pumps are calculated from the feed flow rates determined by the pump characteristics and the desired reflux ratio.

All of the process data such as pH value, temperature and oxygen concentration are recorded and saved in a measured data archive so that they are available for later graphic and statistical analysis or for export to Excel.

The plant can also be extended to include additional measurement technology such as redox potential at the customer's request.





Technical data

Dimensions and weights

KA 1	
Dimensions in cm (W x D x H)	approx. 70 x 62 x 170
Weight	approx. 40 kg
KA 1/SR	
Dimensions in cm (W x D x H)	approx. 90 x 62 x 186
Weight	approx. 49 kg
KLD 4	
Dimensions in cm (W x D x H)	approx. 120 x 62 x 186
Weight	approx. 56 kg
KLD 4/SR	
Dimensions in cm (W x D x H)	approx. 135 x 62 x 186
Weight	approx. 65 kg
KLD 4 N	
Dimensions in cm (W x D x H)	approx. 120 x 62 x 186
Weight	approx. 58 kg
KLD 4 N/SR	
Dimensions in cm (W x D x H)	approx. 135 x 62 x 186
Weight	approx. 67 kg

Order data

Type	Article description	Art. no.
KA 1	Lab-scale wastewater treatment plant, complete	B00218272
KA 1/SR	Lab-scale wastewater treatment plant, complete, with controlled oxygen aeration	B00218276
KLD 4	Lab-scale wastewater treatment plant, complete, with denitrification stage	B00218274
KLD 4/SR	Lab-scale wastewater treatment plant, complete, with denitrification stage and controlled oxygen aeration	B00218277
KLD 4 N	as KLD 4, with continuous sludge return	B00218278
KLD 4N/SR	as KLD 4/SR, with continuous sludge return	B00218279



behr Labor-Technik GmbH • Spangerstraße 8 • 40599 Düsseldorf/Germany
 Tel.: (+49) (0) 211-7 48 47 17 • Fax: (+49) (0) 211-7 48 47 48
 eMail: info@behr-labor.com • Internet: www.behr-labor.com



Subject to technical changes and errors.