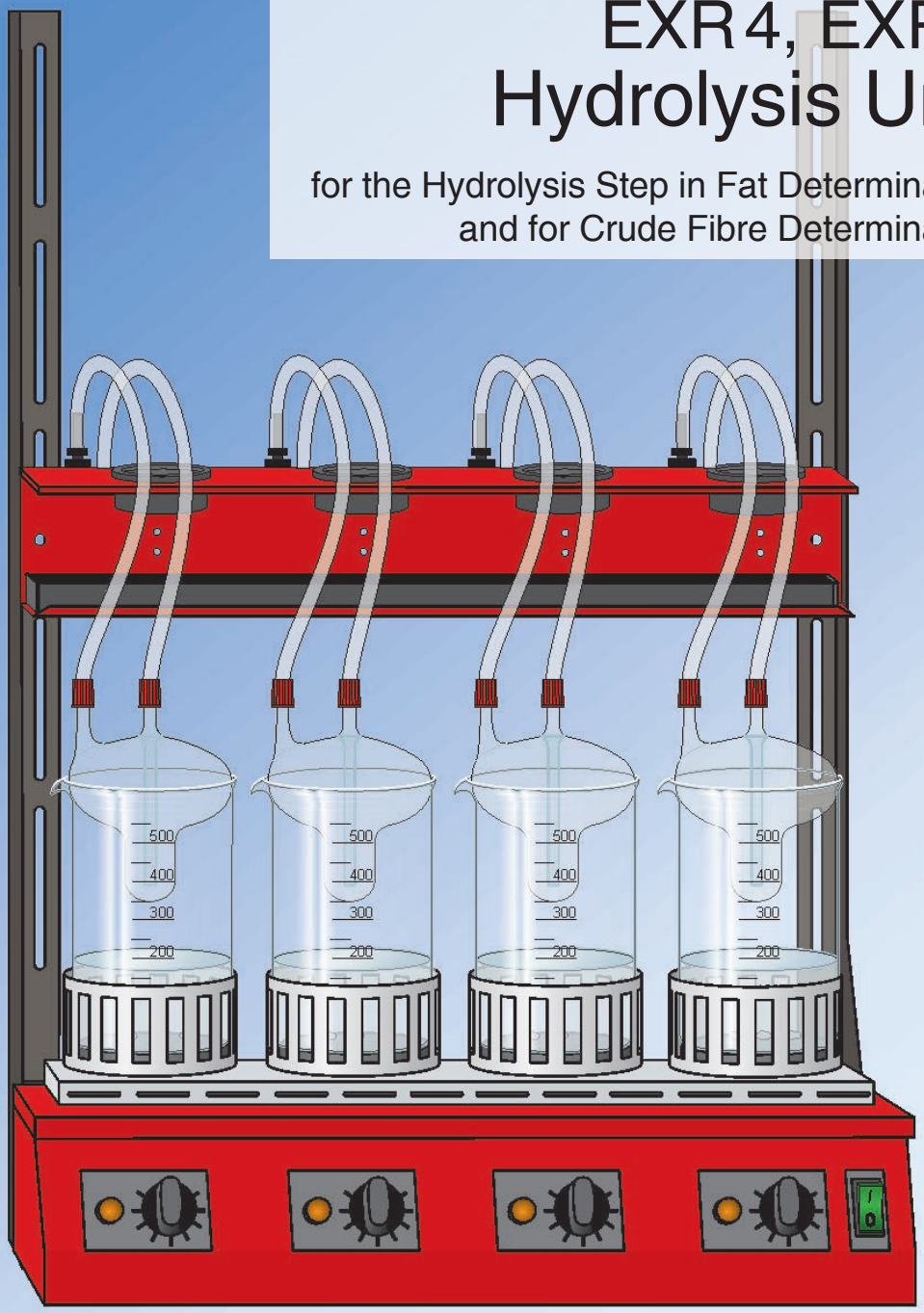
behr
Labor-Technik

EXR 4, EXR 6
Hydrolysis Unit

for the Hydrolysis Step in Fat Determination
and for Crude Fibre Determination



Operating manual

133103

Please read these operating instructions carefully before starting up your new hydrolysis unit!

The operating manual gives clear and simple instructions for use of the apparatus.

In the interests of eliminating risk please observe the safety instructions given in this manual! They are marked with a ⚠ symbol.

Additional useful and important information on the functioning of the apparatus is marked by a stripe in the margin.

We wish you every success in your work with the

EXR 4 / EXR 6
Hydrolysis unit

133103

Safety Advice

Hazardous gas danger!
Always conduct the hydrolysis in a fume hood.

Danger of electric shock! Make sure that no liquids get into the cable connections or the inside of the equipment.

Be careful in working with chemicals! Follow the safety guidance in the pertinent Safety Data Sheets.

Glass can break and cause injury! In working with glass components, observe all appropriate safety precautions.

Danger of burns: the reaction vessels get hot! Do not touch the vessels with bare hands during and immediately after doing a hydrolysis.

Danger of fire or explosion!
The steps of the procedure that work with organic solvents must not be carried out on the serial heater. Do not spill solvents on the hot heating plates.

133103

Contents

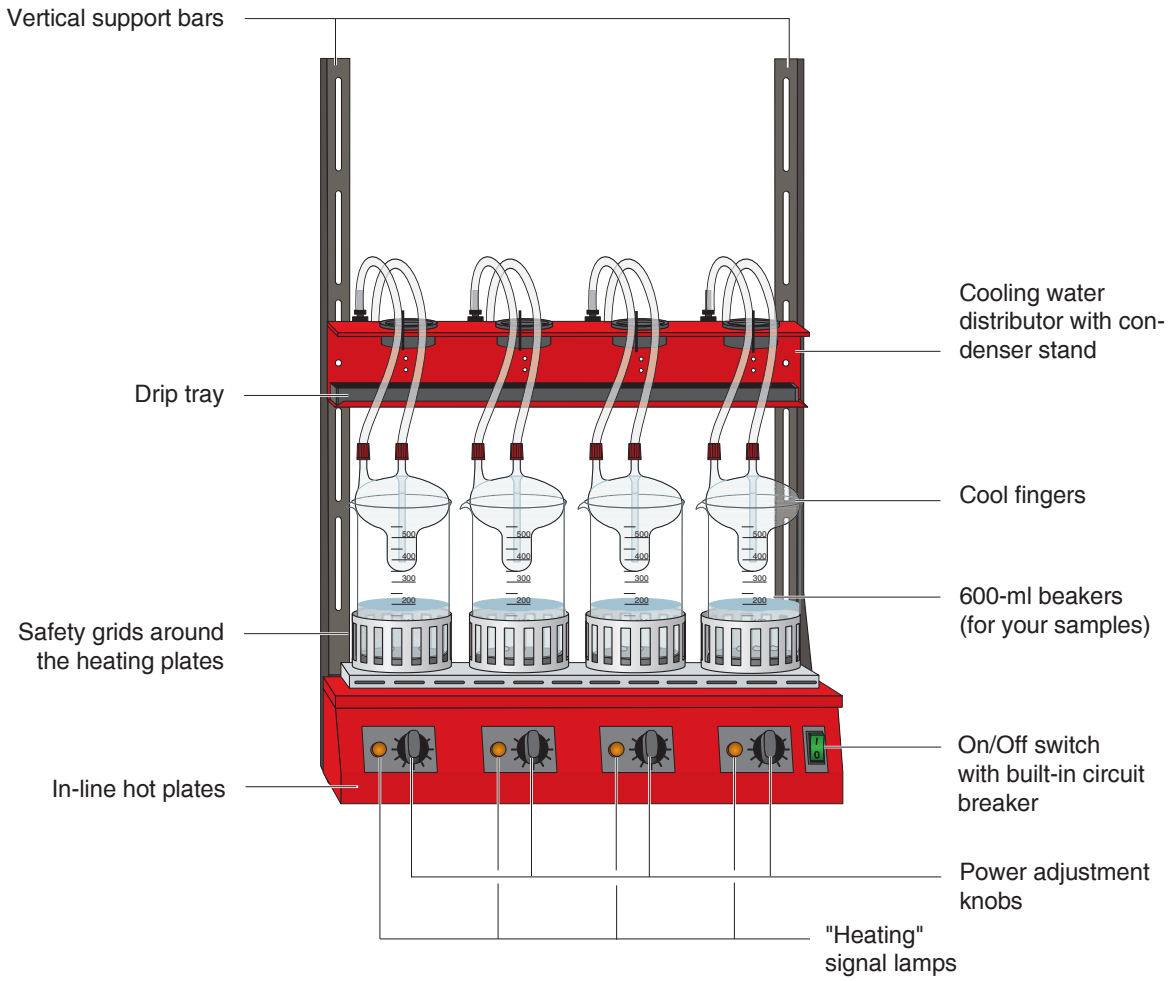
Description

The behr In-Line Hydrolysis Unit is used for heating samples in water-based solution in beakers, especially for

- Crude fibre determination according to ISO 6865 ("Weende procedure")
- the hydrolysis step in total fat determination (ISO 11085)
- Weibull-Stoldt fat hydrolysis.

Depending on the model and configuration, the apparatus consists of four or six individually adjustable heating positions for 600-ml beakers. They are cooled by cool fingers placed on top of the beakers that are supplied with water from a cooling-water distributor bar.

After hydrolysis is finished, the cool fingers are parked in a condenser stand where they wait for the next samples to be started. This makes handling easy, saves room in your lab and makes for a well-arranged working place.



133103

Contents of Delivery

Scope of supply

Immediately on receipt, check the contents of the delivery for absence of damage and completeness.

A claim for damage in transport which is evident on the outside of the packing must be immediately submitted to the carrier (postal, rail or road haulage carrier) – see the shipping label on the package.

If components are damaged, but no damage to the external packing was evident (concealed transport damage), contact the behr customer service immediately (also in the event of other complaints). The address is:

behr Labor-Technik GmbH
Spangerstraße 8
40599 Düsseldorf / Germany
Phone: (+49 211) 7 48 47 17
Telefax: (+49 211) 7 48 47 48
eMail: info@behr-labor.com

133103

Parts list

All behr In-Line Extraction Units consist of a

Basic unit for four or six samples (EXR 4, EXR 6)

1 In-line hot-plate array R 4 (4 hot plates) or R 6 (6 hot plates)
2 Vertical support bars
1 Cooling water distributor with condenser stand (1, 4 or 6 place) and drip tray,
1 Water inflow hose, polyamide, Ø 8 mm
1 Water outflow hose, PVC, Ø 12 mm
1 Disconnecting tool for Speedfit hose connections
1 Connection for ¾“ pipe thread water tap
1 Adapter for ½“ pipe thread water tap
1 Operating manual

Depending on the model and configuration, the following hydrolysis accessories are included:

EXR 4

4 Beakers, 600 ml, tall form
4 Cold fingers for 600-ml beakers
8 Silicone tube 6 x 2 mm, 50 cm

EXR 6

6 Beakers, 600 ml, tall form
6 Cold fingers for 600-ml beakers
12 Silicone tube 6 x 2 mm, 50 cm

Additionally you need, depending on the kind of analyses you are going to do:

Filtration device

Drying oven

Analytical balance

For fat determinations: extraction device

For crude fibre detemination: muffle furnace

Optional

Pumparound cooler UK 12/1000 or UK 12/2000 for cooling water distribution

133103

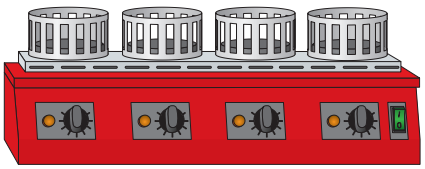
Assembling the behrotest® Hydrolysis Unit

Hazardous gas danger! Always conduct the hydrolysis in a fume hood.

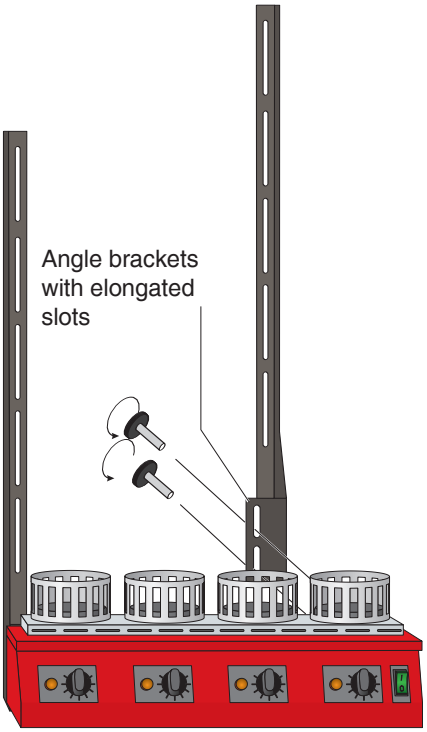
Danger of electric shock! Make sure that no liquids get into the cable connections or the inside of the equipment.

Glass can break and cause injury! In working with glass components, observe all appropriate safety precautions.

Mounting the support bars



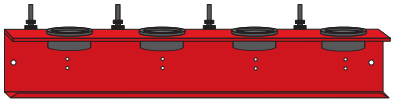
- Place the in-line hot-plate array on a flat level surface.



- Attach both vertical support bars to the side of the in-line hot-plate array using the four knurled screws provided.

Make sure that the lower ends of the support bars, which are to be attached to the hot-plate array, are resting on the bench top. The angle bracket for attaching the support bars has elongated slots for inserting the screws. This allows you to adjust the vertical height of the support bars.

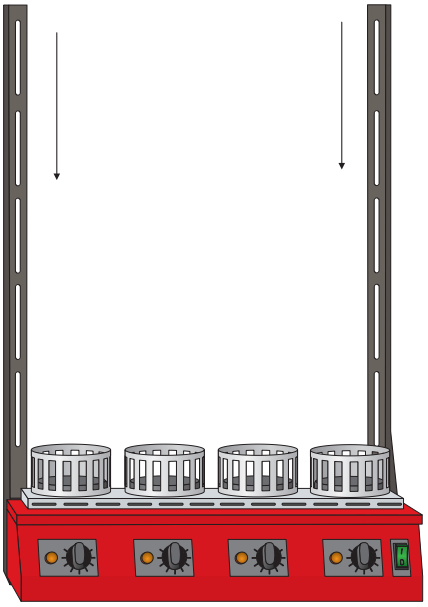
Mounting the condenser stand



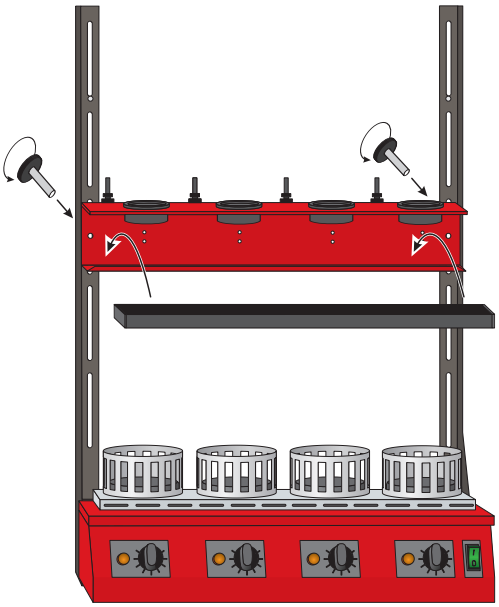
The condenser stand fulfills two functions:

- It contains the cooling water distributor and the tube connectors
- and its borings allow you to store the cool fingers when hydrolysis is finished.

The rack must therefore be mounted such that the cool fingers may easily be transferred from the rack to the beakers and back to the rack, without the cooling-water tubes getting tangled or kinked. The best way to achieve that is mounting the condenser stand in medium height of the support bars.

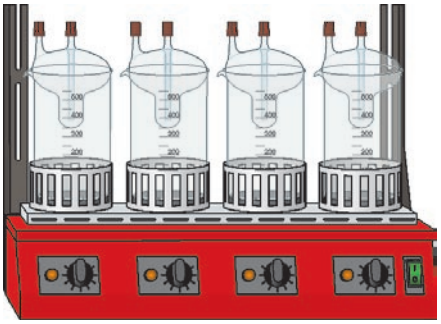


- ➤ Insert the cooling water distributor from above between the internal track formed by the horizontal support bars.
- ➤ Position the screw hole of the condenser stand at the lower ends of the third (middle) elongated slots in the vertical support bars.



- ➤ Fasten the condenser stand in place with the pair of knurled screws provided.
- ➤ Insert the drip tray into the condenser stand.

Inserting the glassware



- ➤ Place the beakers on the heating plates.
- ➤ Place the cool fingers on top of the beakers.

133103

Connecting the water tubing

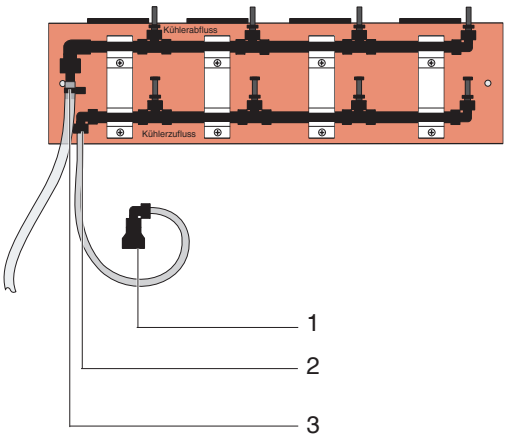
Cooling water distributor

1. Cooling water supply

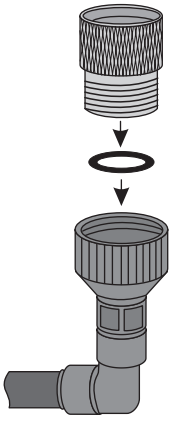
The cooling water supply hose is made of polyamide and is 2 meters long. If necessary, shorten it as required.

> Use only a very sharp blade, such as a scalpel or box cutter to cut polyamide hoses. The cut end must be free of burrs and at a sharp right angle. Avoid deformation of the hose. By following these procedures a leak-free seal will be guaranteed in the push-on fitting.

The connection (2) for the cooling water supply hose is found on the rear of the condenser stand.



- Push one end of the water supply hose as far as it will go into the connection.
- In the same manner, attach the ¾“ water tap connection (1) to the other end of the hose.
- Bring the water supply hose to a laboratory water tap.



Water tap with ¾“ pipe thread
Insert a washer in the connector and screw the fasten the water supply hose to the water tap by screwing the connector onto the ¾“ pipe thread of the water tap.
Water tap with ½“ pipe thread:
Use the ¾“ to ½“ adapter.
Place a washer in the connector and screw the adapter and connector together. Then screw the adapter onto the ½“ pipe thread of the water tap.

2. Cooling water outflow

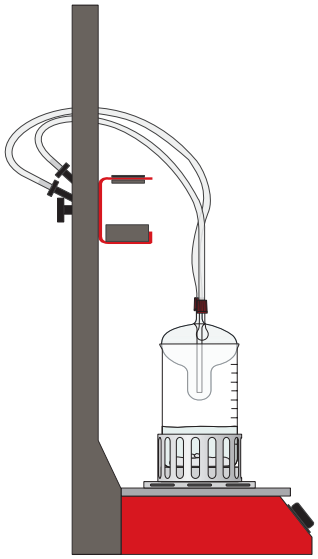
The connection for the cooling water outflow (3, figure on previous page) is likewise located on the rear of the cooling water distributor with condenser stand.

- Insert the black tubing segment of the outflow (drain) hose as far as it will go into the hose receptacle.
- Lay the hose to a sink or other drain.

> Insure that there are no tight curves or kinks in the hose. If necessary, shorten the hose to prevent constrictions of this nature.

133103

3. Connections to the cool fingers

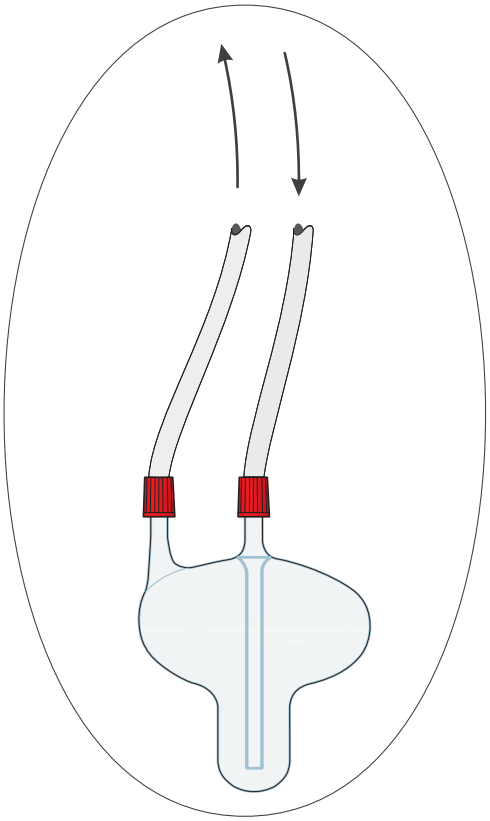


- Cut appropriate lengths of the silicone tubing included in the delivery.

The lengths of the tubing segments should be such as to permit comfortable unhindered operation of the work station. The segments must not be so short that they are under tension, nor should they be so long that they tangle or kink as a result of hanging down too far.

- Attach the silicone tubing segments to the tubing nipples on the cooling water distribution unit identified as „Kühlerabfluss“ (outflow) and „Kühlerzufluss“ (inflow).

- Attach the tubing segments to the condensers.



The nipple in the mid of the cool finger is for water inflow. Connect the tubing segments coming from the lower „Kühlwasserzufluss“ panel of the cooling water distributor to these nipples. Connect the nipples near the side of the condensers in the same manner with the upper „Kühlwasserabfluss“ panel of the cooling water distributor.

How to disconnect the quick push-in connections

If needed, the connections of the polyamide tubing or the tubing nipples can easily be disconnected. Use the special tool provided for this purpose.

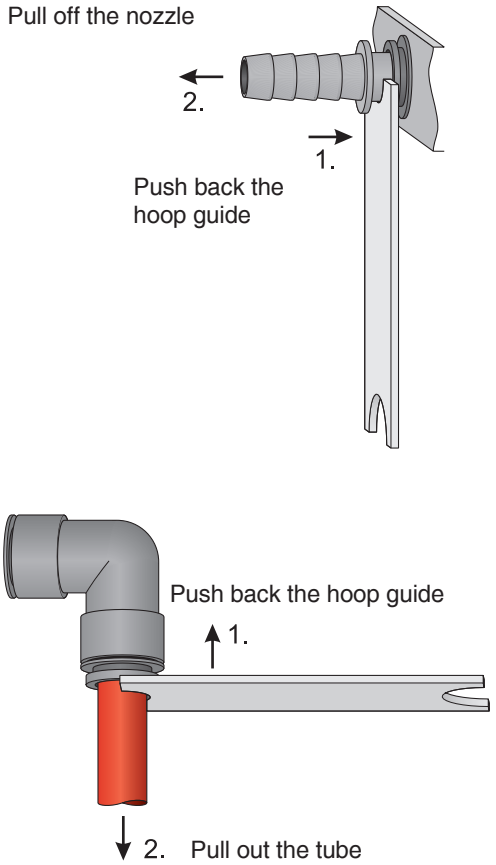
Use the narrow slot of the tool for the nipples and the inflow tube and the wide slot for the outflow tube.

1. Tubing nipple quick push-in connector

- Place the tool in front of the annular rim of the quick connector.
- With the other hand, grasp the tubing nipple.
- Press the annular rim inwards with the tool while simultaneously pulling the tubing nipple forwards and out of the cooling water distributor.

2. Inflow/Outflow Quick Connector

- Place the tool in front of the annular rim of the quick connector of the hose.
- With the other hand, grasp the hose.
- Press the annular rim inwards with the tool while simultaneously pulling the hose forwards and out of the quick connector.



Using a Model UK 12 circulating water cooler

Follow carefully the instructions in the UK 12 User's Manual.

The hose set of the circulating water cooler contains an adapter for connection to the inflow and outflow hoses of the cooling water distributor.

Attach the free end of the inlet hose with an adapter. Insure that you push the end of the hose into the connector as far as it will go. Connect the inlet hose to the water outflow outlet of the circulating water cooler.

Complete the circuit by collecting the outlet hose of the cooling water distributor to the inlet of the circulating water cooler.

133103

Connecting to the mains power line

- First insure that the local mains (electrical) power is of the same voltage as that indicated on the model label of your behrotest® inline apparatus.
- Insure that the power switch on the front of the inline apparatus is set to „0“.
- Insert the plug of the electrical power cable coming from the back of the in-line hot-plate array into a mains power socket.

Leak testing

You can now check the hose and tubing connections for leaks.

- Turn on the water tap and make any necessary changes to the hose and tubing connections.

Operating the Hydrolysis Unit

Hazardous gas danger!
Always conduct the hydrolysis in a fume hood.

Danger of electric shock! Make sure that no liquids get into the cable connections or the inside of the equipment.

Be careful in working with chemicals! Follow the safety guidance in the pertinent Safety Data Sheets.

Glass can break and cause injury! In working with glass components, observe all appropriate safety precautions.

Danger of burns: the reaction vessels get hot! Do not touch the vessels with bare hands during and immediately after doing a hydrolysis.

Danger of fire or explosion!
The steps of the procedure that work with organic solvents must not be carried out on the serial heater. Do not spill solvents on the hot heating plates.

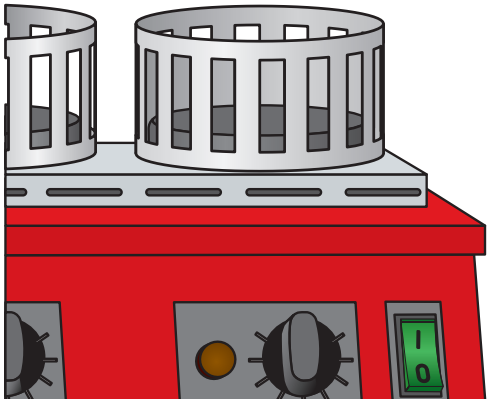
Preparing the samples

- Prepare the samples for hydrolysis and fill them into the beakers.
- Add some boiling stones.
- Place the cool fingers on top of the beakers and open the cooling water supply.

Switching the hot-plate array on

- Switch the main switch on the front of the in-line hot-plate array to "I" position.

The electrical power switch of the hydrolysis unit fulfills two functions. It serves to turn the apparatus on and off and also has an electrical circuit-breaker built in.
This circuit breaker operates in a similar manner as those used in homes. If too much current is drawn, it shuts off.
The operation of this circuit breaker requires that a spring within it be cocked. For this reason, a somewhat stronger pressure is required on the switch to turn it on than is required in a similar switch without circuit breaker.



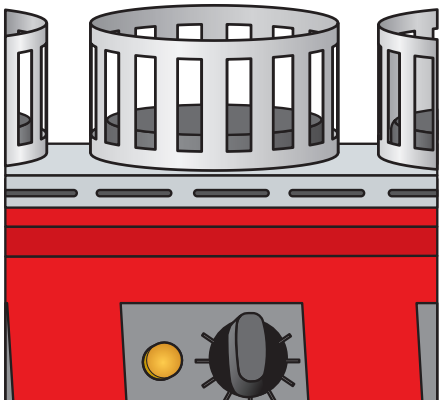
Starting hydrolysis

Caution: reaction vessels get hot and can cause burns! Do not touch the reaction vessels with bare hands during and immediately after hydrolysis.

Adjust the heating power of the individual heating places by means of the power adjustment knobs.

Adjust the power in such a way that the liquids will keep boiling but the steam will not escape but condense on teh cool fingers.

The yellow signal lamp at the left of each adjustment knob will show you if this heating plate is actually heating.



133103

Finishing hydrolysis

Caution: reaction vessels get hot and can cause burns! Do not touch the reaction vessels with bare hands during and immediately after hydrolysis.

- Turn the power adjustment knobs to zero.
- Turn the in-line hot-plate array off by means of the MAIN SWITCH.
- Wait for the contents of the beakers to cool down.
- Turn the cooling water supply off.
- Take the cool fingers off and place them in the condenser stand.
- Now the samples are ready for processing.

Cleaning

The support framework and mountings are robust and acid resistant, but should nonetheless not be cleaned with aggressive cleaning agents.

Take the drip tray out of the condenser stand regularly and clean it.

Customer Service

In the event of a malfunction or defect in your behrotest® hydrolysis unit, please contact our customer service:

behr Labor-Technik GmbH
Spangerstraße 8
D-40599 Düsseldorf
Phone: (+49 211) 7 48 47 17
Telefax: (+49 211) 7 48 47 48
E-mail: info@behr-labor.de

133103

Spare parts

Description	Art. Spec.	Art. No.
Circulating water cooler, 1000 W	UK 12/1000	B 002 17 940
Circulating water cooler, 2000 W	UK 12/2000	B 002 17 942
Beaker 600 ml, tall form	BG6	B 002 31 807
Cool finger	CFI	B 002 32 939
Safety grid for the heating plates		B 004 91 280
Silicone tube 6 x 2 mm		B 002 24 981

Technical data

	EXR 4	EXR 6
Dimensions (W x D x H) in mm	530 x 320 x 740	760 x 320 x 740
Total weight (not including glassware)	15.1 kg	19.8 kg
Nominal voltage hot-plate array	230 / 115 V~	230 / 115 V~
Frequency	50/60 Hz	50/60 Hz
Nominal power consumption hot-plate array	1440 W	1960 W
Current for 230 V	8 A	10 A

133103