Rotary Evaporator
BM110

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User Guide
User Guide
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IKA RV 8
240
IKA HB 10
584
60

Contents

Declaration of conformity

We declare under our sole responsibility that this product corresponds to the regulations 2014/35/EU, 2006/42/EC, 2014/30/EU and 2011/65/EU and conforms with the standards or standardized documents EN 61010-1, EN 61010-2-051; EN 61326-1 and EN 12100.

Explication of warning symbols

General hazard.

This symbol identifies information **that is of vital importance for protecting your health and safety**. Disregarding this information may lead to health impairment and injuries.

This symbol identifies information **that is of vital importance for the technically correct functioning of the system**.
Disregarding this information may result in damage to the instrument or to system components.

This symbol indicates information **which is important for proper use and ensuring that the operations of the instrument are performed efficiently.**
Failure to observe this information may result in inaccurate results.

Danger - Reference to exposure to a hot surface!

Safety instructions

For your protection

The safety lift operates at power failure and when the device is switched off. It is designed to raise itself with the glassware attached. Therefore, please note that the lift without glass assemblies goes up quickly due to the reduced weight.

- **Read the operating instructions completely before starting up and follow the safety instructions.**
- Keep the operating instructions in a place where they can be accessed by everyone.
- Ensure that only trained staff work with the appliance.
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations. **When working under a vacuum in particular!**
- Wear your personal protective equipment in accordance with the hazard category of the medium to be processed. There may be a risk of:
  - splashing liquids,
  - body parts, hair, clothing and jewellery getting caught,
  - injury as a result of glass breakage.

⚠ DANGER

Inhalation of or contact with media such as poisonous liquids, gases, spray mist, vapours, dusts or biological and microbiological materials can be hazardous to user.

- Set up the device in a spacious area on an even, stable, clean, non-slip, dry and fireproof surface.
- Ensure that there is sufficient space above the device as the glass assembly may exceed the height of the device.
- Prior to each use, always check the device, accessories and especially the glass parts for damage. Do not use damaged components.
- Ensure that the glass assembly is tension-free! Danger of cracking as a result of:
  - stress due to incorrect assembly,
  - external mechanical hazards,
  - local temperature peaks.
- Ensure that the stand does not start to move due to vibrations respectively unbalance.
- Beware of hazards due to:
  - flammable materials,
  - combustible media with a low boiling temperature,
  - glass breakage.

⚠ CAUTION

Only process and heat media that has a flash point higher than the adjusted safe temperature limit of the heating bath that has been set. The safe temperature limit of the heating bath must always be set to at least 25 °C lower than the fire point of the media used.

- Do **not** operate the appliance in explosive atmospheres, with hazardous substances or under water.
- Only process media that will not react dangerously to the extra energy produced through processing. This also applies to any extra energy produced in other ways, e.g. through light irradiation.
- Tasks with the device must only be performed when operation is monitored.
- Operation with excess pressure is not permitted (for cooling water pressure see "Technical Data").
- Do not cover the ventilation slots of the device in order to ensure adequate cooling of the drive.
- There may be electrostatic discharges between the medium and the drive which could pose a direct danger.
- The appliance is not suitable for manual operation (except lift movement).
- Safe operation is only guaranteed with the accessories described in the "Accessories" chapter.
- Refer to the operating instructions for the HB 10 heating bath.
- Refer to the operating instructions for the accessories, e.g. vacuum pump.
- Position the positive pressure outlet of the vacuum pump under a fume hood.
- Only use the device under an all side-closed exhaust, or a comparable protective device.
- Adapt the quantity and the type of distill and to the size of the distillation equipment. The condenser must work properly. Monitor the cooling water flow rate at the condenser outlet.
- The glass equipment must always be ventilated when working under normal pressure (e.g. open outlet at condenser) in order to prevent a pressure build-up.
- Please note that dangerous concentrations of gases, vapors or particulate matter can escape through the outlet at the condenser. Take appropriate action to avoid this risk, for example, downstream cold traps, gas wash bottles or an effective extraction system.
- Evacuated glass vessels must not be heated on one side; the evaporating flask must rotate during the heating phase.
- The glassware is designed for operation under a vacuum of down to 2 mbar. The equipment must be evacuated prior to heating (see chapter"Commissioning"). The equipment must only be aired again after cooling. When carrying out vacuum distillation, uncondensed vapours must be condensed out or safely dissipated. If there is a risk that the distillation residue could disintegrate in the presence of oxygen, only inert gas must be admitted for stress relief.

⚠ CAUTION

Avoid peroxide formation. Organic peroxides can accumulate in distillation and exhaust residues and explode while decomposing! Keep liquids that tend to form organic peroxides away from light, in particular from UV rays and check them prior to distillation and exhaust for the presence of peroxides. Any existing peroxides must be eliminated. Many organic compounds are prone to the formation of peroxides, e.g. dekalin, diethyl ether, dioxane, tetrahydrofuran, as well as unsaturated hydrocarbons, such as tetralin, diene, cumene and aldehydes, ketones and solutions of these substances.

⚠ DANGER

The heating bath, tempering medium, evaporation flask and glass assembly can become hot during operation and remain so for a long time afterwards! Let the components cool off before continuing work with the device.

⚠ WARNING

Avoid delayed boiling! Never heat the evaporating flask in the heating bath without switching on the rotary drive! Sudden foaming or exhaust gases indicate that flask content is beginning to decompose. Switch off heating immediately. Use the lifting mechanism to lift the evaporation flask out of the heating bath. Evacuate the danger zone and warn those in the surrounding area!

Safety lift

When the device is switched off or the power supply disconnected, the internal safety lift removes the evaporating flask from the heating bath.

The safety lift at loss of power is designed for a maximum total weight (glassware and solvent) of 3.1 kg.

Sample calculation of the maximum load with vertical glassware and a 1 litre flask:

Condenser + receiving flask + evaporating flask + fittings=

1200 gr + 400 gr + 280 gr + 100 gr = 1980 gr

Maximum loading of solvent = 3100 gr – 1980 gr = 1120 gr

Due to the design, operation of the safety lift cannot be guaranteed for higher loads!

When using other types of condensers such as dry ice or intensive condensers, and also when using return distillation distributors with slip-on condensers, it may be necessary to reduce the load by the amount of the added weight of the glass apparatus.

Thus, prior to distillation, check whether the lift, laden with the glassware and distillation material, rises when power is lost.

The safety lift must be checked daily prior to operation!

Attach the maximum total weight of 3.1 kg to the lift. Manually move the lift to the lowest position and press the "Power" key on the front panel or the main switch on the back right side of the device.

The evaporating flask is lifted out of the heating bath.

If the safety lift does not work, please contact the Impact Service department.

For the evaporating equipment (evaporating flask plus contents), the maximum permissible weight is 3.0 kg! Loads greater than this risk breakage of glass at the steam pipe!

Ensure that the safety lift has been powered down.

When working with large loads, always use low speeds. Unbalanced loads can result in breakage of the steam pipe!

- A vacuum may be formed inside the glassware in the case of power outage. The glassware must be vented manually.

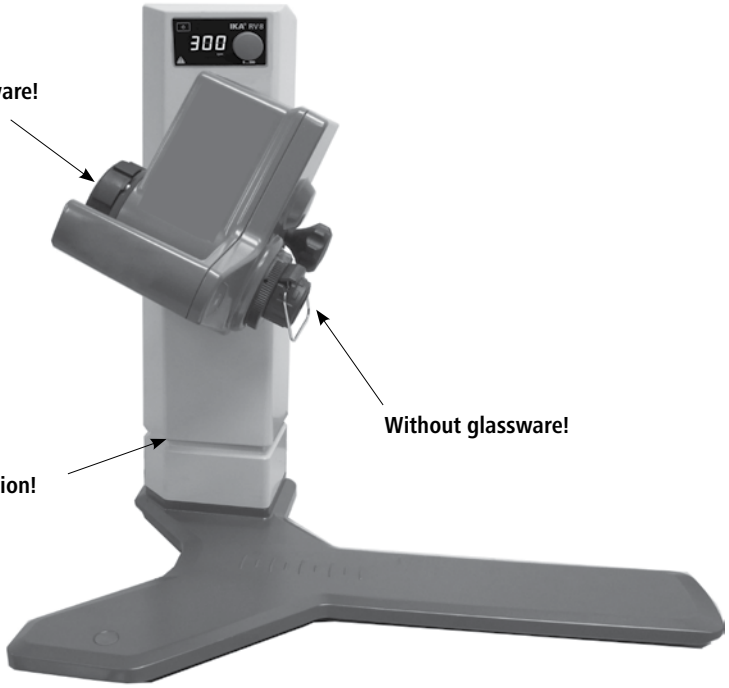
⚠ CAUTION

Never operate the device when the evaporation flask is rotating and the lift is raised. Always lower the evaporation flask into the heating bath first before starting the rotation drive. Otherwise hot tempering medium may be sprayed out!

- Set the speed of the drive so no tempering medium is sprayed out as a result of the evaporation flask rotating in the heating bath. If necessary reduce the speed.
- Do not touch rotating parts during operation.
- Imbalance may result in uncontrolled resonance behavior of the device or assembly. Glass apparatus may be damaged or destroyed. In the event of unbalance or unusual noises, switch off the appliance immediately or reduce the speed.
- The appliance does not start up again automatically following a cut in the power supply.
- The device is only disconnected from the power supply network if the device power switch is off or the plug is pulled out.
- The socket for the mains cord must be easily accessible.

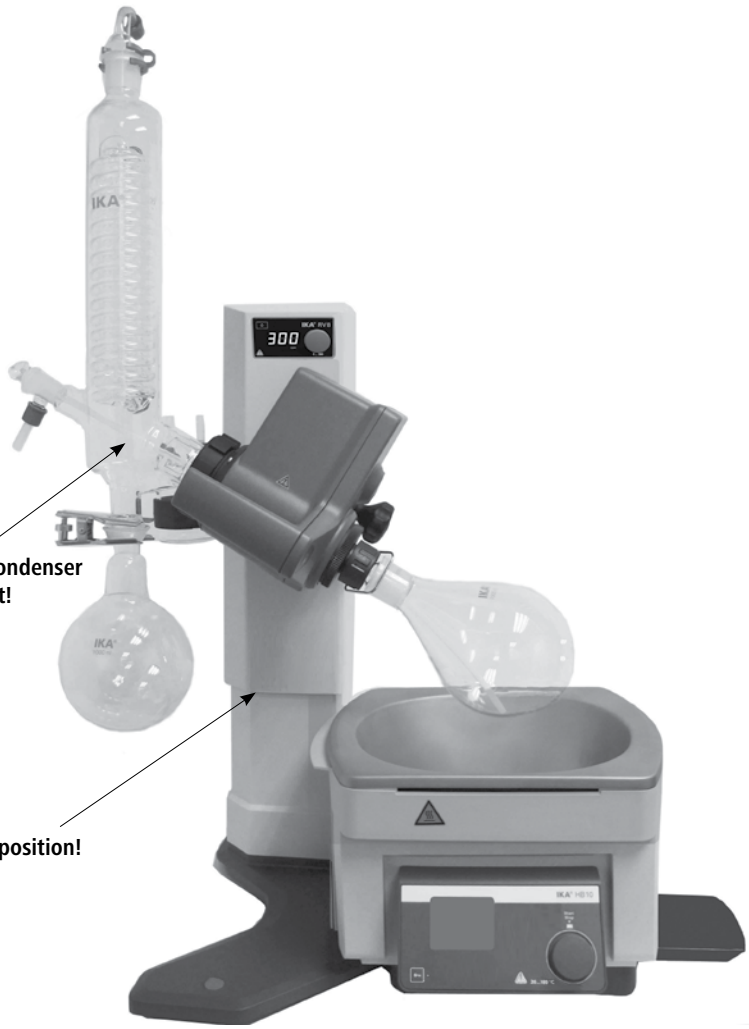
For protection of the equipment

- The voltage stated on the type plate must correspond to the mains voltage.
- Socket must be earthed (protective ground contact).
- Removable parts must be refitted to the appliance to prevent the infiltration of foreign objects, liquids, etc.
- Protect the appliance and accessories from bumps and impacts.
- The appliance may only be opened by experts.



DANGER!

- ☞Take care! Fast lift movement without glassware because of spring inside!
- ☞Shut down device only in upper position!



Note:

- ☞Safe lift movement!
- ☞Device can be switched off at any time!

Correct use

- **Use**

Together with the recommended accessories, the device is suitable for:

- quick and gentle distillation of liquids,
- evaporation of solutions and suspensions,
- crystallization, synthesis or cleaning of fine chemicals,
- drying of powder and granulate material,
- recycling of solvents.

Mode of operation: Tabletop device

- **Range of use**

- Laboratories
- Pharmacies
- Schools
- Universities

The safety of the user cannot be guaranteed if: the appliance is operated with accessories that are not supplied or recommended by the manufacturer, the appliance is operated improperly according to the manufacturer's specifications.

Unpacking

- **Unpacking**

- Please unpack the device carefully
- In the case of any damage a report must be sent immediately (post, rail or forwarder)

- **Contents of package**

	Drive RV 8	Heating bath HB 10	Vertical glassware RV 10.1	Vertical glassware RV 10.10 coated	Serrated washer M6	Cylindrical M6x25	Ring spanner	Desktop switching	RV 10.8001 Seal	Foot	Right-angle T20	HEXAGON DIN911 SW5	Holding bracket	Condensate flask	Screwed Plug D	Screwed -Joint Cap	Tube clip D=9mm	Operating instructions	Base	Vapour tube	Power cable
Package 1 / RV 8 V	**1**	**1**	**1**		**4**	**4**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**2**
Package 2 / RV 8 VC	**1**	**1**		**1**	**4**	**4**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**2**
Package 3 / RV 8 flex	**1**	**1**			**4**	**4**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**2**

Contents of package RV 8

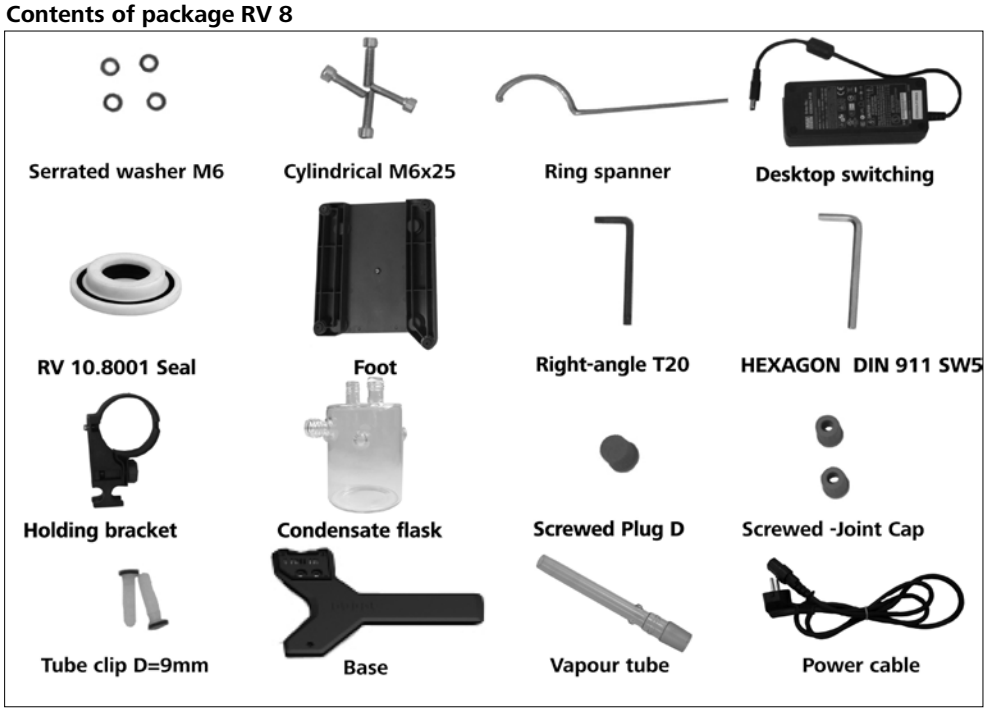


Fig. 6

Useful information

Distillation is a thermal separating process for liquid compounds based on substance-specific, pressure-dependent boiling points through evaporation and subsequent condensation.

The boiling point temperature decreases with decreasing external pressure which means that work is usually done under reduced pressure. In this way the heating bath can be maintained at a constant temperature (e.g. 60 °C). Using the vacuum, the boiling point is set with a steam temperature of approx. 40 °C. The cooling water for the condensation condenser should not be warmer than 20 °C (60-40-20 rule).

A chemical resistant membrane pump with a vacuum controller should be used to create the vacuum. The pump is protected from solvent residue by the addition of a Woulff bottle and/or a vacuum separator.

Working with a jet pump to create a vacuum can only be recommended to a limited extent as the solvents may contaminate the environment when using these systems.

Speed, temperature, flask size and system pressure all affect the evaporator air capacity.
The optimum capacity of the flow-through condenser is approx. 60%.

This corresponds to condensation on approx. 2/3 of the cooling coil. With larger capacities there is the risk that the uncondensed solvent vapor will be extracted.

⚠ CAUTION

The device is equipped with a Lift safety unit.
If the power cuts out, the evaporation flask is automatically lifted out of the heating bath by an integrated gas spring.
"**CAUTION!** The safety lift must be checked daily before use. See safety notes / safety lift ! "
The glass apparatus can be evacuated after power outage!

When using other types of condensers such as dry ice or intensive condensers as well as when using return distillation distributors with slip-on condensers, it may be necessary to reduce the mass of the media to compensate for the mass of this additional glassware. Thus, prior to distillation, check whether the lift goes up without power when laden with the glass and distillation material.

The device is designed for operation with a cooling water supply system (e.g. laboratory thermostat), but can also be run off a water supply line. Please refer to the Technical Data for information on cooling water pressure, temperature constancy, and flow rate.

Setting up

Drive RV 8

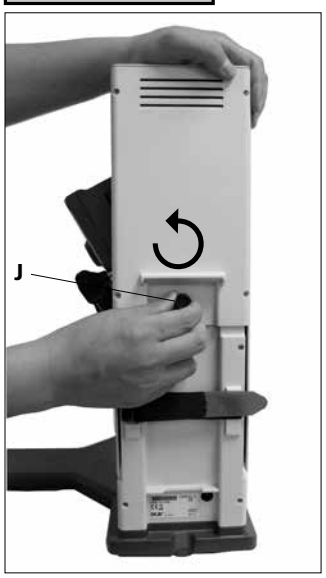
1.) Mount the base to the lift. (Fig. 7)

Fig. 7

- Apply Cylindrical M6x25 (**F**) (4x) and Serrated washer M6 (**G**) (4x) to mount base (**H**) with Lift Unit (**I**) after you unpack the package. (Fig. 7)

2.) Remove transportation lock (Fig. 8)

⚠ CAUTION



- Hold the lift with your hand on the height position and remove the thumb screw (**J**) by turning counterclockwise on the back of the appliance.

Take care! DANGER!
Once the transportation lock has been removed, the lift moves fast to its upper end position. The distance is approx.120 mm.

Fig. 8

3.) Fix the Desktop switching. (Fig. 9)

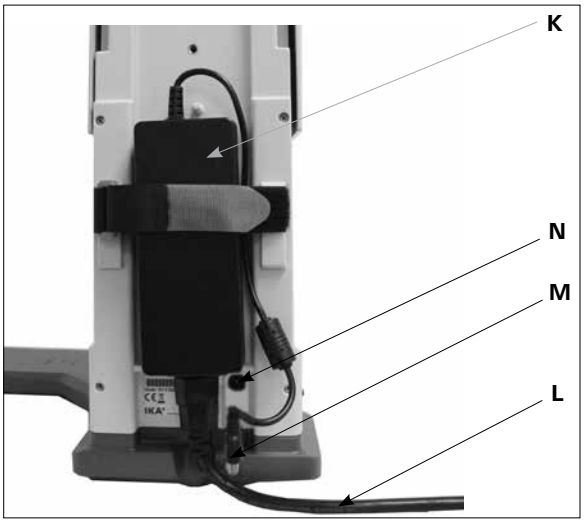


Fig. 9

- Attach the switching adapter (**K**) on the rear side. Secure it with the Velcro, by contracting both tabs on the switching adapter. The Velcro must not be below the switching adapter.
- Connect the Low-voltage connector (**M**) to the connection socket (**N**). (Fig. 9)
- Plug the power cord (**L**) in the switching adapter and connect it to the power source.
- Observe the valid supply voltage.

4.) Fix the Holding bracket (Fig.10)

Fig.10

5.) Insert the bottle and attach the supplied hose connectors to the bottle. (Fig. 11)

Fig.11

6.) Adjust the angle of the rotation head. (Fig. 12)

- Remove the clamping device for the angle setting of the rotation drive on the right side of the lift by rotating the knob counterclockwise.

Fig.12

7.) Set the drive at an angle of approx. 30°. (Fig. 13)

Fig.13

- Then, secure the rotary drive against rotation by tightening the adjustable knob clockwise.

Glassware

NOTE: Please read the operating instructions of the glassware for the safe handling of laboratory glassware !

- There is a locking knob **(P)** for locking or unlocking the locking device **(O)**.
  If a red mark **(Q)** is shown, the locking device is unlocked, otherwise it is locked.
  To lock or unlock the locking device **(O)**, push the locking knob **(P)** to the end position.

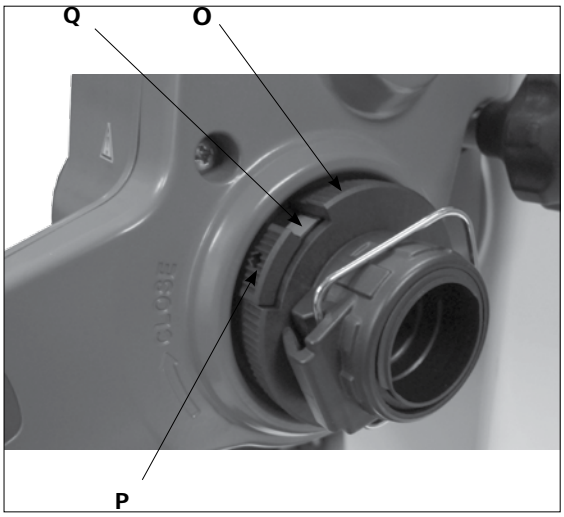


Fig.14a

- Open the locking device **(O)** on the drive head by turning it 60° counterclockwise. Then you can see a red mark **(Q)** .

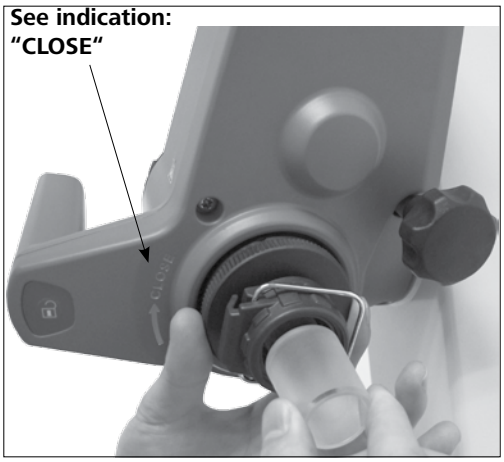


Fig.14b

- Feed the vapour tube (**R**) in until it stops.
- Then, lock the locking device **(O)** by turning it clockwise by 60°.

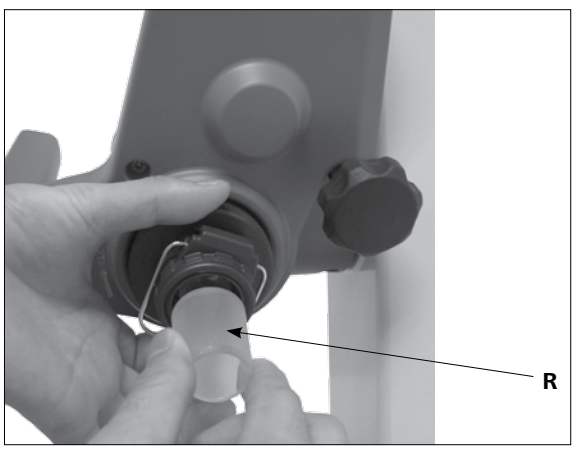


Fig.14c

- Pushing the lock knob (**P**) to the end position, the red mark (**Q**) should be covered and invisible.
- The vapour tube is not allowed to be pulled out!
- Check the correct axial locking device on the vapour tube.
- Keep the red mark **(Q)** invisible.

Fit & unfit the evaporation flask / push off mechanism

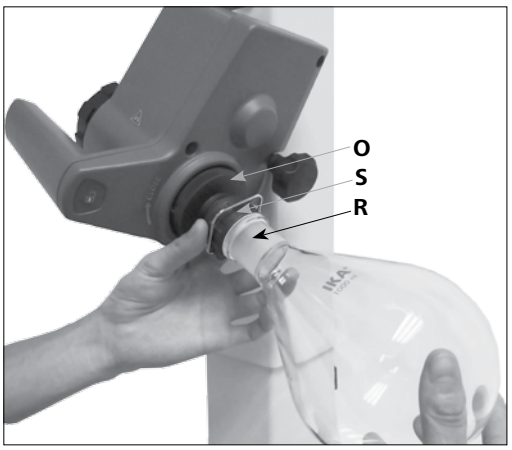


Fig.15a

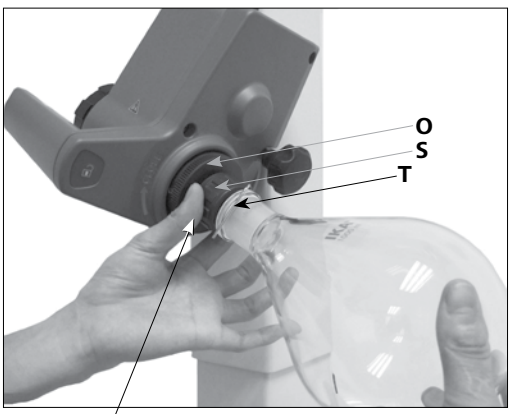


Fig.15b

Turn clockwise (↻) for tight-fitting
Turn counterclockwise (↺) for loosen tight-fitting

Mount the evaporation flask:

- Place the evaporation flask on the Vapour tube (**R**). (Fig.15a)
- Turn the plastic nut (**S**) with the clip (**T**) counterclockwise until the clip can be put on the flange. (Fig. 15b)
- Now turn the plastic nut clockwise until the clamp is hard up against the flange. When doing so, hold the locking device (**O**) on the steam pipe.

Remove the evaporation flask:

- Hold the locking device (**O**) and loosen the plastic nut by turning it counterclockwise. This releases a tightly clamped evaporating flask.
- Hold the evaporating flask at the flange and open the jaws of the clamp.
- Remove the evaporating flask.
- Check that the locking of vapour tube is still closed!

• Place the RV 10.8001 condenser seal **(U)** in the condenser receptacle and fit the glassware to the device according to the assembly instructions. (Fig. 16, 17 and 18)

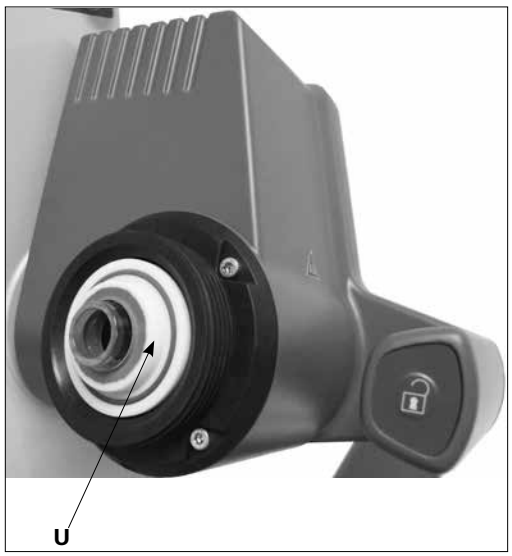


Fig.16

Mount the condenser

• Place the cap nut into the condenser, and then put the spring ring to the flange of the condenser (**V**).
• Place the condenser on the rotary drive (**W**) and tighten the cap nut by hand. (Fig.17)

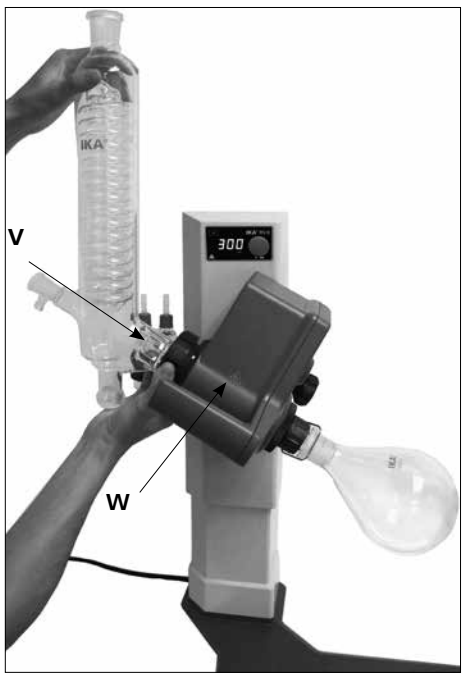
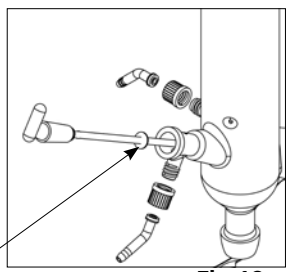


Fig.17

• Fix the receiving flask and hose connectors as shown. See also operating manual of glassware. (Fig.18)

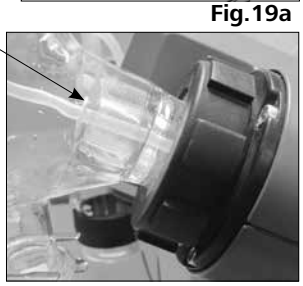
Fig.18

Mounting the washer



Drainage washer

Fig.19a



Note: Pay attention to the correct position of the washer.

Fig.19b

Removing the condenser

• Use the ring spanner provided to loosen union nuts that are tightly fitted.
• Loosen the union nut by turning anticlockwise.

• **RV 10.3 Vertical-intensive condenser with manifold**
  This vertical-intensive condenser features a double jacket design for particularly efficient condensation.
  Also available with coating (RV 10.30)
• **RV 10.4 Dry ice condenser**
  Dry ice condenser for distilling low-boiling solvents. Cooling by dry ice, no cooling water required. Maximum condensation thanks to low temperatures.
  Also available with coating (RV 10.40)

- **RV 10.5 Vertical-condenser with manifold and cut-off valve for reflux distillation**
  Also available with coating (RV 10.50)
- **RV 10.6 Vertical-intensive condenser with manifold and cut-off valve for reflux distillation**
  This vertical-intensive action condenser features a double jacket design for particularly efficient reflux distillation.
  Also available with coating (RV 10.60)

Hose system

- Connect the water hoses (**H_2O**) to the condenser according to the counter-flow principle. (Fig. 20)
- Install the vacuum connections to the condenser, Woulff bottle, vacuum controller with valve and vacuum pump.
- Always connect the vacuum hose **(vac**) to the condenser at the highest point to minimize solvent losses during suctioning.
- Use standard laboratory vacuum hoses with an inside diameter of 8 mm and a wall thickness of 5 mm (see accessories).

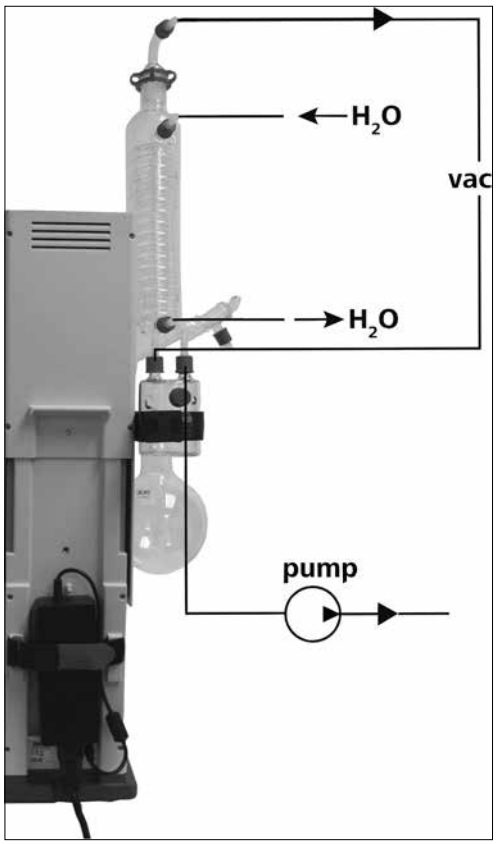


Fig. 20

Heating bath HB 10

⚠ CAUTION

Refer to the chapter entitled "Commissioning" in the heating bath instruction manual !

- **Assemble the foot of the heating bath HB 10**

For operation of the HB 10 heating bath in combination with the RV 8, the foot plate supplied must be fitted to the heating bath.

Caution: It is not permitted to use HB 10 heating bath fitted with a foot plate in combination with any other type of rotary evaporator.

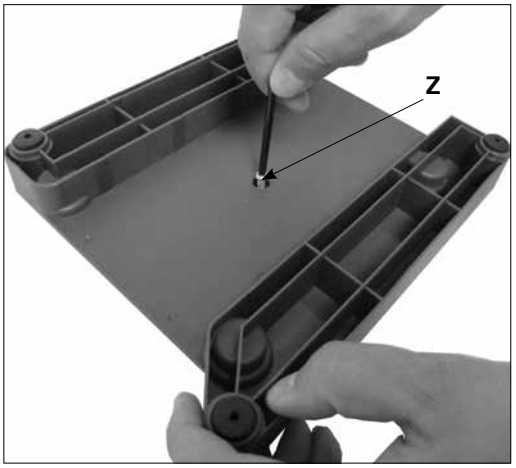


Fig. 21a

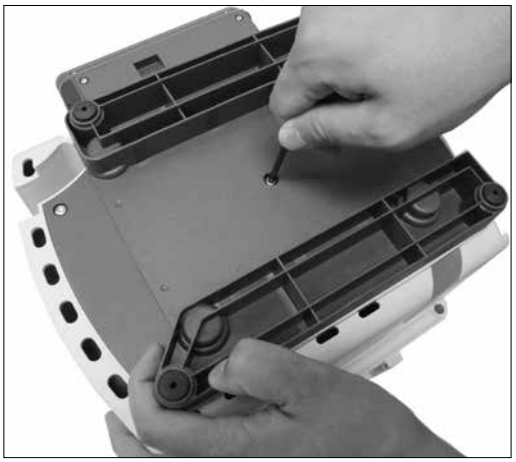


Fig. 21b

Unscrew the screw (**Z**) fully out of the foot. (Fig. 21a)
Press the foot with the pin and the O-rings on it into the hole in the heating bath base plate as far as the stop.
Tighten the screw (**Z**) by hand. (Fig.21b)

- Place the heating bath on the stand of the rotation drive and push it into the left position. (Fig. 22)

Fig. 22

The unit is ready for service when the mains plug has been plugged in.

Fig.5

Function keys (Fig.3)

Fig.3

- **"Power" key (1)**
  When the power switch **(5)** is switched on, the device will be in "activated" mode.
  Touch the "Power" key **(1)** for about 1 second, the status of the device will be changed from "activated" mode to "stand-by" mode.
  Touch the "Power" key again shortly, the status of the device will be changed back to "activated" mode immediately.

- **Display window/speed (2)**
  Display **(2)** shows "8.8.8."
  then Softwareversion "X.X".
  Display shows "set value".
  Note: The device is not deenergized until the mains power supply has been interrupted, for instance by unplugging the power cable.

- **Rotating knob (3)**
  To start the rotation, press the rotary knob.
  The indicator flashes until the set speed in rpm (revolution per minute) is reached.
  By turning the rotary knob, the speed can be changed.
  To stop the rotation, press the rotary knob again.
  The last displayed speed value is stored.

Filling the evaporation flask:

You can fill the evaporation flask manually prior to creating the vacuum. The evaporation flask should not be filled more than half its volume.

⚠ CAUTION *The maximum allowed load (evaporation flask and contents) is 3 kg.*

Filling medium by vacuum: prior to filling the evaporation flask, a vacuum controller is used to regulate the glass apparatus to the target pressure.

- Now fill the evaporation flask using the backfeed line.
- Due to the vacuum present, the solvent is suctioned into the evaporation flask. This enables you to keep solvent loss due to suctioning to a minimum.

Setting up the heating bath:

Also refer to the operating instructions for the HB 10 heating bath!

- Move the lift to the bottom position and check the position of the heating bath in relation to the evaporation flask. When using larger evaporation flasks (2 or 3 liters) or depending on the angle of the rotation drive, you can move the heating bath to the right.
- Fill the heating bath with the tempering medium until the evaporation flask is surrounded by tempering medium to 2/3 of its volume.
- Switch on the rotation drive and slowly increase the speed.

Note: Avoid creating waves.

- Switch on the heating bath using the main on/off switch.

Note: Avoid stress on the glass due to different evaporation flask and heating bath temperatures when lowering the evaporation flask into the heating bath!

Lift position key (4&6) (Fig. 23a and Fig. 23b)

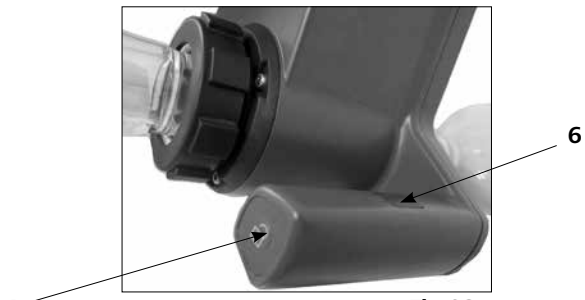


Fig.23a

Fig.23b

To adjust the lift position, grasp the handle and press the left or right lock button (**4**).
The hand must rest on the sensor (**6**).
*Note: Hand detection sensor **(6)**, only to be touched by hand, do not press!*
The lift lock is unlocked and you can move the lift up and down.
Release the lock button or remove the hand from the lift, the lift is locked in the adjusted position.
When locking and unlocking, a clear "click" sound is heard.

Assembling the stand pillar RV 8.1 (Accessories)

No stand is required if the condenser has been properly fitted and secured by tightening the condenser union nut on the rotary drive.
The purpose of the stand is solely to prevent the condenser twisting.

⚠ WARNING

Caution: If the RV 8.1 stand is fitted incorrectly, the strong forces at the Velcro strap can cause stresses within the glass, which in turn can cause damage to the glass condenser.

After the condenser has been fitted, the RV 8.1 stand is attached to the rotary drive. Make sure that the condenser is installed parallel to the lift body.

- Guide the stand rod through the hole on the underside of the rotary drive,
- Screw the knurled screw into the tapped hole but do not tighten it,
- Move the stand until the upper rubber sleeve rests against the glass condenser,
- Tighten the knurled screw finger-tight,
- Secure the condenser to the stand using the pre-fitted Velcro strap.

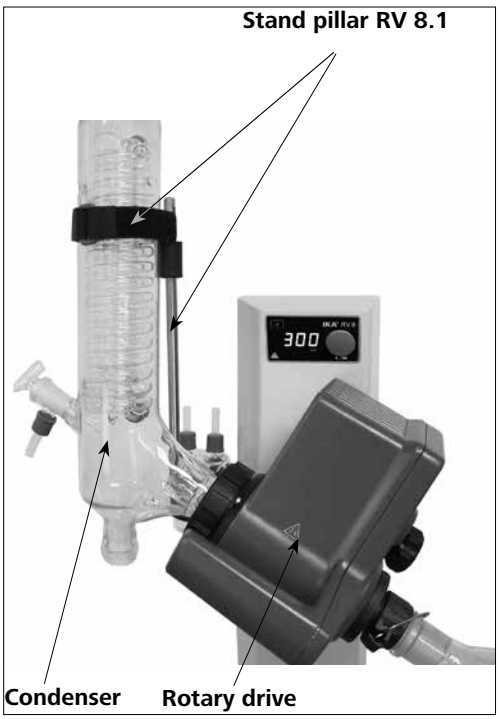
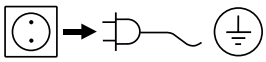


Fig.24

Maintenance and Cleaning

The instrument is maintenance-free. It is only subject to the natural wear and tear of components and their statistical failure rate.

Cleaning



Disconnect main plug prior to cleaning!

To clean the device use only water with a detergent that contains tenside, or use isopropyl alcohol for stubborn soiling.

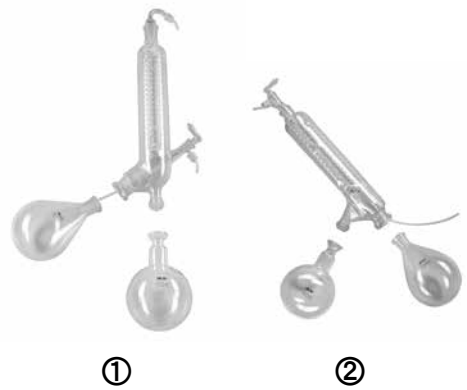
Spare parts order

When ordering spare parts, please give:
- Machine type,
- Serial number, see type plate,
- Software version,
- Designation of the spare part, .

Repair

Please send instrument in for repair only after it has been cleaned and is free from any materials which may constitute a health hazard.

Accessories



NS 29/32 Vertical glassware (1)
NS 29/32 Vertical glassware, coated (1)
NS 29/32 Diagonal glassware (2)
NS 29/32 Diagonal glassware, coated (2)

NS 29/42 Vertical glassware (1)
NS 29/42 Vertical glassware, coated (1)
NS 29/42 Diagonal glassware (2)
NS 29/42 Diagonal glassware, coated (2)

NS 24/40 Vertical glassware (1)
NS 24/40 Vertical glassware, coated (1)
NS 24/40 Diagonal glassware (2)
NS 24/40 Diagonal glassware, coated (2)

Vertical-intensive condenser with manifold (1)
Vertical-intensive condenser with manifold, coated (1)
Dry ice condenser (2)
Dry ice condenser , coated (2)
Vertical-condenser with manifold and cut-off valve for reflux distillation (no picture)
Vertical-condenser with manifold and cut-off valve for reflux distillation, coated (no picture)
Vertical-intensive condenser with manifold and cut-off valve for reflux distillation (3)
Vertical-intensive condenser with manifold and cut-off valve for reflux distillation, coated (3)

NS 29/32 Vapour tube
NS 24/29 Vapour tube
NS 29/42 Vapour tube
NS 24/40 Vapour tube

NS 29/32 Evaporation flask 50 ml
NS 29/32 Evaporation flask 100 ml
NS 29/32 Evaporation flask 250 ml
NS 29/32 Evaporation flask 500 ml
NS 29/32 Evaporation flask 1000 ml
NS 29/32 Evaporation flask 2000 ml
NS 29/32 Evaporation flask 3000 ml

NS 24/32 Evaporation flask 50 ml
NS 24/32 Evaporation flask 100 ml
NS 24/32 Evaporation flask 250 ml
NS 24/32 Evaporation flask 500 ml
NS 24/32 Evaporation flask 1000 ml
NS 24/32 Evaporation flask 2000 ml
NS 24/32 Evaporation flask 3000 ml
NS 24/40 Evaporation flask 1000 ml

NS 29/42 Evaporation flask 50 ml
NS 29/42 Evaporation flask 100 ml
NS 29/42 Evaporation flask 250 ml
NS 29/42 Evaporation flask 500 ml
NS 29/42 Evaporation flask 1000 ml
NS 29/42 Evaporation flask 2000 ml
NS 29/42 Evaporation flask 3000 ml

NS 24/40 Evaporation flask 50 ml
NS 24/40 Evaporation flask 100 ml
NS 24/40 Evaporation flask 250 ml
NS 24/40 Evaporation flask 500 ml
NS 24/40 Evaporation flask 1000 ml
NS 24/40 Evaporation flask 2000 ml
NS 24/40 Evaporation flask 3000 ml

KS 35/20 Receiving flask 100 ml
KS 35/20 Receiving flask 250 ml
KS 35/20 Receiving flask 500 ml
KS 35/20 Receiving flask 1000 ml
KS 35/20 Receiving flask 2000 ml
KS 35/20 Receiving flask 3000 ml

KS 35/20 Receiving flask, coated 100 ml
KS 35/20 Receiving flask, coated 250 ml
KS 35/20 Receiving flask, coated 500 ml
KS 35/20 Receiving flask, coated 1000 ml
KS 35/20 Receiving flask, coated 2000 ml
KS 35/20 Receiving flask, coated 3000 ml

NS 29/32 Powder flask 500 ml
NS 29/32 Powder flask 1000 ml
NS 29/32 Powder flask 2000 ml

NS 24/29 Powder flask 500 ml
NS 24/29 Powder flask 1000 ml
NS 24/29 Powder flask 2000 ml

NS 29/32 Powder flask 500 ml
NS 29/32 Powder flask 1000 ml
NS 29/32 Powder flask 2000 ml

NS 24/40 Powder flask 500 ml
NS 24/40 Powder flask 1000 ml
NS 24/40 Powder flask 2000 ml

NS 29/32 Evaporation cylinder 500 ml
NS 29/32 Evaporation cylinder 1500 ml

NS 24/29 Evaporation cylinder 500 ml
NS 24/29 Evaporation cylinder 1500 ml

NS 29/42 Evaporation cylinder 500 ml
NS 29/42 Evaporation cylinder 1500 ml

NS 24/40 Evaporation cylinder 500 ml
NS 24/40 Evaporation cylinder 1500 ml

NS 29/32 Foam brake
NS 24/29 Foam brake
NS 29/42 Foam brake
NS 24/40 Foam brake

NS 29/32 Distillation spider with 6 distilling sleeves
NS 29/32 Distillation spider with 12 distilling sleeves
NS 29/32 Distillation spider with 20 distilling sleeves

NS 24/29 Distillation spider with 6 distilling sleeves
NS 24/29 Distillation spider with 12 distilling sleeves
NS 24/29 Distillation spider with 20 distilling sleeves

NS 29/42 Distillation spider with 6 distilling sleeves
NS 29/42 Distillation spider with 12 distilling sleeves
NS 29/42 Distillation spider with 20 distilling sleeves

NS 24/40 Distillation spider with 6 distilling sleeves
NS 24/40 Distillation spider with 12 distilling sleeves
NS 24/40 Distillation spider with 20 distilling sleeves

Distilling sleeve 20 ml

NS 29/32 Distillation spider with 5 flasks 50 ml
NS 29/32 Distillation spider with 5 flasks 100 ml

NS 24/29 Distillation spider with 5 flasks 50 ml
NS 24/29 Distillation spider with 5 flasks 100 ml

NS 29/42 Distillation spider with 5 flasks 50 ml
NS 29/42 Distillation spider with 5 flasks 100 ml

NS 24/40 Distillation spider with 5 flasks 50 ml
NS 24/40 Distillation spider with 5 flasks 100 ml

Seal

RV 8.1 Stand pillar

RV 8.2 Stopper

Error Codes

Any malfunctions during operation will be identified by an error message on the display.
Once a serious error message has been displayed, the lift moves to the top end position and the device can no longer be operated.
Proceed as follows in such cases:
- switch off device using the main switch,
- carry out corrective measures,
- restart device.

Error code	Cause	Effect	Correction
E03	Temperature inside the device is too high	Room temperature > 40 °C	- Switch off the device - Let the device cool down - Check the location (see Technical data)
E04	Target speed is not reached Motor blocked	Load too large Cable break	- Reduce the volume in the evaporator
E09	Flash memory storage error	Transmission error	- Turn the unit off and on again

If the actions described fail to resolve the fault or another error code is displayed, then take one of the following steps:
- contact the service department,
- send the device for repair, including a short description of the fault.

Technical data

Operating voltage range	Vac	(100 – 240) ± 10%
Rated voltage	Vac	100 – 240
Frequency	Hz	50 / 60
Rated power of RV 8 device(without heating bath)	W	75
Rated power (max.) of switching adaptor	W	90
Speed	rpm	5 – 300
Speed tolerance Set speed: < 100 rpm Set speed: ≥ 100 rpm	rpm %	± 1 ± 1
Speed display	mm	digital
Dimensions of visible display area (W x H)		37 x 18
Display		7 segments display
Smooth start		yes
Lift		manual
Stroke	mm	120
Head angle adjustable		0° – 45°
Cooling surface	cm^2	1500
Cooling water flow rate min.	l/h	30
Cooling water flow rate max.	l/h	100
Cooling water pressure max.	bar	1
Perm. On-time	%	100
Perm. ambient temperature	°C	5 – 40
Perm. relative humidity	%	80
Protection acc. to DIN EN 60529		IP 20
Protection class		I
Contamination level		2
Weight (no glassware; no heating bath)	kg	12.5
Dimensions (W x D x H)	mm	595 x 390 x 615
Operation at a terrestrial altitude	m	max. 2000

Subject to technical changes!

Solvent table (excerpt)

Solvent	Formula	Pressure for boiling point 40 °C in mbar (For HB 10 approx. 60 °C)
Acetic acid	$C_2H_4O_2$	44
Acetone	C_3H_6O	556
Acetonitrile	C_2H_3N	226
N-Amylalcohol	$C_5H_{12}O$	11
n-Pentanol	$C_5H_{10}O$	11
n-Butanol	C_4H_{10}	25
tert. Butanol	$C_4H_{10}O$	130
2-Methyl-2-Propanol	$C_4H_{10}O$	130
Butylacetate	$C_6H_{12}O_2$	39
Chlorobenzene	C_6H_5Cl	36
Chloroform	$CHCl_3$	474
Cyclohexane	C_6H_{12}	235
Dichloromethane	CH_2Cl_2	atm. press.
Methylenechloride	CH_2Cl_2	atm. Press.
Diethylether	$C_4H_{10}O$	atm. press.
1,2,-Dichloroethylene (trans)	$C_2H_2Cl_2$	751
Diisopropylether	$C_6H_{14}O$	375
Dioxane	$C_4H_8O_2$	107
Dimethylformamide (DMF)	C_3H_7NO	11
Ethanol	C_2H_6O	175
Ethylacetate	$C_4H_8O_2$	240
Ethylmethylketone	C_4H_8O	243
Heptane	C_7H_{16}	120
Hexane	C_6H_{14}	335
Isopropylalcohol	C_3H_8O	137
Isoamylalcohol	$C_5H_{12}O$	14
3-Methyl-1-Butanol	$C_5H_{12}O$	14
Methanol	CH_4O	337
Pentane	C_5H_{12}	atm. press.
n-Propylalcohol	C_3H_8O	67
Pentachloroethane	C_2HCl_5	13
1, 1, 2, 2, -Tetrachloroethane	$C_2H_2Cl_4$	35
1, 1, 1, -Trichloroethane	$C_2H_3Cl_3$	300
Tetrachloroethylene	C_2Cl_4	53
Tetrachloromethane	CCl_4	271
Tetrahydrofurane (THF)	C_4H_8O	357
Toluene	C_7H_8	77
Trichloroethylene	C_2HCl_3	183
Water	H_2O	72
Xylene	C_8H_{10}	25

Warranty

The warranty period is 24 months. For claims under the warranty please contact your local dealer.

The warranty does not cover worn out parts, nor does it apply to faults resulting from improper use, insufficient care or maintenance not carried out in accordance with the instructions in this operating manual.