

Intelligent Evaporation



... no **task**
too **big**

While you concentrate on research, we'll look after your support needs

As we want you to have more time to thoroughly concentrate on research, the whole Heidolph team enthusiastically provides you with extensive support and helps to reduce your workload

- 24 hour service for all inquiries
- Individual application support
- Short delivery time for standard items
- After sales service provided by your local dealer
- More than 80 distributors worldwide
- Priority technical service
- Long-lasting service life of all products due to corrosion-resistant electronics and maintenance-free motors
- 3 year warranty

Intelligent Evaporation



- Significant Time and Cost Savings
- Industry Leading Safety Features
- Unattended Operation

**Reduced Process
Times**

Summary:

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Technical specifications - Large Scale Rotary Evaporator

Model	Laborota 20
Rotation speed (rpm)	6 - 160
Rotation speed setting	digital
Hand / Motor lift	motor lift
Height adjustment speed	45 mm/s
Height adjustment (mm)	200
Drive	capacitor motor
Heating capacity (W)	4,000
Temperature range (°C)	20 - 100 (H ₂ O)
heating bath	20 - 180 (oil)
Temperature accuracy (°C)	± 1
Overheat cut-off protection (°C)	110 (H ₂ O) / 210 (oil)
Bath temperature setting	digital
Automatic heating bath control	micro processor
Material heating bath	V4A (1.4404)
Heating bath (mm)	400
Volume heating bath (l)	24 (H ₂ O) / 22 (oil)
Display vapor temperature (required accessories)	digital temperature sensor

Model	Laborota 20
Vacuum controller	yes
Timer	yes
Vacuum control program $p_{(const)}$ **	yes
Vacuum control program $P_{(auto)}$ requires $T_{(auto)}$ sensor	yes
Programmable ramps	yes
Supply power (W)	4,500
Weight (without glass assembly) (kg)	approx. 120
Size (w/o glass assembly)(l x w x h)(mm)	1,000 x 700 x 1,620
Protection class (DIN EN 60529)	IP 20
Operation conditions (°C)	0 - 40 at 80 % rel. humidity
Rate of evaporation (L/h) ΔT^* 20/40 °C	
- Toluene	13.9 / 27.9
- Acetone	10.0 / 19.9
- Ethanol	7.2 / 14.4
- Water	2.2 / 4.4
Maximum Condensing surface (m ²)	1.2
Supply voltage *** (V/Hz)	400 V / 50 Hz 230 V / 50/60 Hz

Laborota 20 eco does not include all above mentioned technical specifications - Details on page 10

* ΔT = difference between heating bath temperature and boiling temperature

** only in combination with vacuum systems

*** Standard 400 V / 50 Hz: Others upon request, please specify for order

The LR 20 Series



Heating Bath

Do you want safe removal and quick flask changes that require only one person with a product that has the highest safety levels worldwide in industrial rotary evaporation?

With the Laborota 20 series you can be sure you are always on the safe side. If you operate the LR 20 unit just by yourself, changing the flask can be accomplished easily in just a few moments.

For your convenience an outlet allows you to **empty the bath** safely and without spills or unnecessary mess

No hassle or safety concerns due to low fluid levels:

Self-filling water bath takes the worry out of running dry

Features **water level regulation system** to prevent water from spilling over and potential floods in your lab

Protect yourself reliably with safety models:

A guard hood consisting of a metal frame and safety glass covers the bath completely. This prevents any operator contact with steam, splashing bath fluid and splinters of glass in case of an implosion



Non-fogging safety glass provides **clear visible monitoring** of the process in your evaporation

Prevent an overheating situation effectively:

A temperature sensor powers off the bath in case of any uncontrolled heat-up event

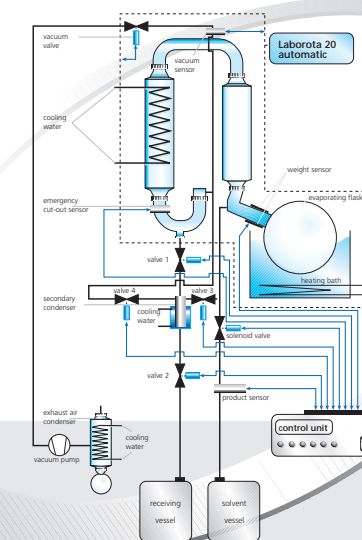
Automated Distillations

Interested in using your work hours more efficiently when evaporating large quantities of solvent?

An automated evaporator allows you to spend a significantly less amount of time on evaporation tasks and more time on other projects to meet your completion deadlines.

Maximize your investment significantly:

The LR 20 automatic is an affordable alternative to common 50 and 100 liter evaporators



Evaporate large quantities overnight or even on weekends without even being in your lab. This greatly reduces solvent vapor exposure during solution filling and receiving vessel draining procedures

Condensate is received and **continuously drained out** of the system through a series of valves, where it is collected in any vessel of your choice under atmospheric pressure

A weight sensor measures the solvent level and **automatically refills** your evaporation flask to an approximate volume to continue bulk evaporation

Your advantages – our Hei-lights

For your safety

- **Protect yourself reliably with safety models:**
A guard hood consisting of a metal frame and safety glass covers the bath completely. This prevents any operator contact with steam, splashing bath fluid and splinters of glass in case of an implosion
- **Excellent user safety** is achieved by a transparent high impact PMMA door on a metal condenser housing covering the main glassware assembly
- Receiving cassette system **protects glassware** while providing superior flask support. Easy access to receiving cassettes via two latching high impact transparent PMMA doors
- **Prevent a bath overheating situation** effectively:
A temperature sensor shuts off the bath in case of any uncontrolled heat-up
- To effectively prevent accidents and monitor parameters, speed, bath temperature and vacuum setting must be confirmed on **separate On/Off buttons to start operation**
- **Certification** according to **GMP** available: validation for installation (IQ) and operating qualification (OQ)
- **Safety cut-out** in an **over pressure situation** caused by glassware breakage or defective vacuum circuit
- To address **your personal safety requirements** rotation drive must be blocked to remove the evaporating flask
- The interface panel has all parameters for operation and displays **5 safety functions** that require operator action prior to resuming evaporation. The functions are designed to promote a safe use of Laborota 20 evaporator and **inform operator of any potential hazards**
- Features water level regulation system to **prevent water from spilling over** and potential floods in your lab
- Safety sensor **stops rotation if the guard hood is opened** during operation providing user safety
- The press of the **Emergency Off switch** brings the entire unit to a complete stop

For your ease of use

- Unique evaporating flask support system allows for **“one person operation”** by safely removing the flask in just moments
- Optional base unit provides you with a **fully maneuverable rotary evaporator** while offering a storage space for vacuum pump, glassware, solvents or accessories
- Receiver cassettes guard against glassware breakage while providing a self-standing flask support and **quick removal** of receiving vessels
- Receiving flasks feature **reinforced bottom drain valves** as standard and are protected by cassettes
- To prevent steam from building up within the guard hood, two strong blowers effectively ventilate the entire area to give you a **clear view of the evaporating flask**
- For your convenience an outlet allows you to **empty the waterbath** safely and without spills or unnecessary mess
- Connect your PC to the RS 232 interface and **save all process data** in a digital file (available: 01.06.2010)
- Now you can manage even the **most demanding applications** easily and eliminate foaming, excessive bubbling or bumping of solutions with the $T_{(auto)}$ distillation program
- Save time with your individualized **pre-programmed parameter settings** of vacuum and temperature gradients for your most common application on a daily basis by saving it as a ramp in memory
- Make your life easier by using the **automatic process timer** which turns off your evaporation at a pre-programmed time
- Reduce your process times by using the exclusive $T_{(auto)}$ program which automates your distillation using a vapor temperature system that takes **the guess work out** of finding the correct vacuum setting every time
- No hassle and safety concern due to low fluid levels: **Self-filling water bath** takes the worry out of running dry



Safety features:

Separate digital displays for all relevant settings

Safety related LED indicate user precaution

- Guard hood is open
- Flask removal support not in place or locked
- Rotation drive locked for flask removal
- Over temperature cut-off activated
- Emergency cut-off in process

Emergency Off switch



Sustainable economic benefits – increased efficiency

- Do not disturb your colleagues anymore; **remove the flask by yourself** in just moments via the flask support system
- Choose the configuration that **serves you and your budget best**: Wide range of options from low end to high end systems and glassware to match the application
- The water bath refill system allows you to step always from your evaporator and **reduce your supervision responsibility** to zero on baths running dry or overheating
- **No hidden cost**: All components to control vacuum are included as a standard. That accounts for vacuum valve, vacuum controller and vacuum sensor
- Maximize your initial investment significantly: Automatic evaporators are an **affordable alternative** to common 50 and 100 liter evaporators
- Spend your **work hours more effectively** on other challenges which require your attention and evaporate large quantities overnight or even on weekends
- All $T_{(auto)}$ evaporations drive your solution to a variable quantity or dryness then shut off vacuum, heating bath, rotation settings and ventilate system to give you semi-automated capabilities at a **significant cost savings**

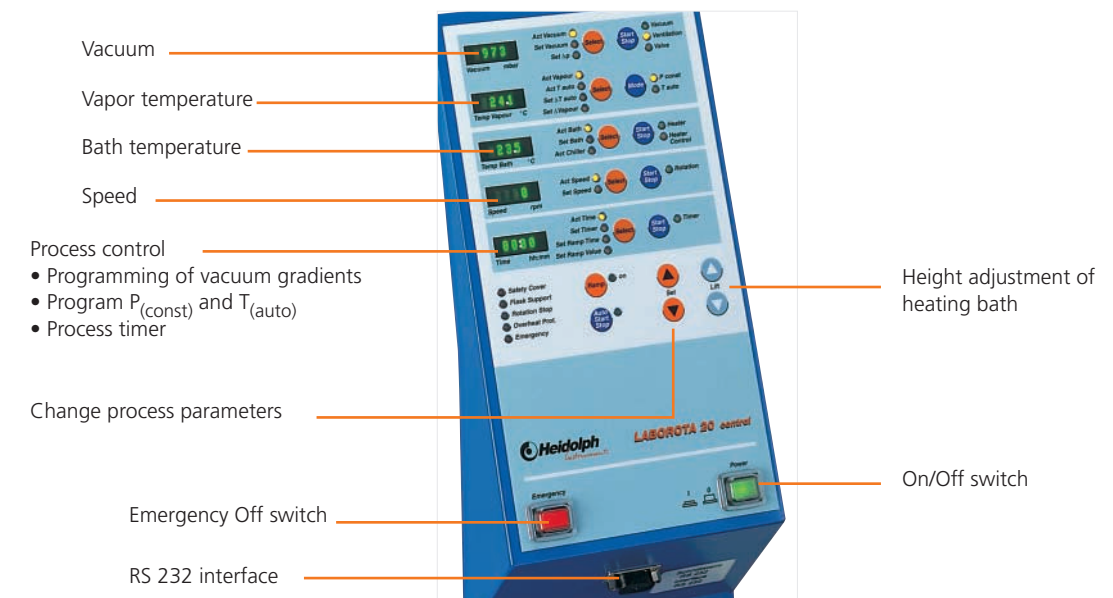
Laborota 20 safety

Highest safety and integrated vacuum control capabilities

Includes all standard LR 20 features for safety, ease of use and economic benefits

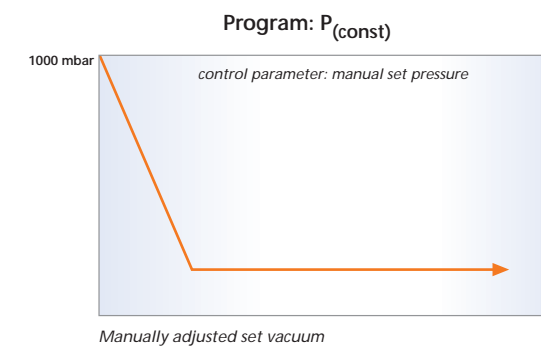


Laborota 20 safety with water bath and glassware set R (without base unit)
P/N 518-11100-00

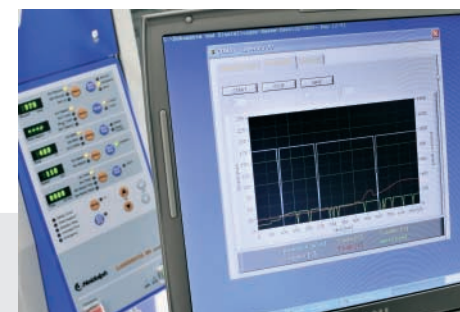
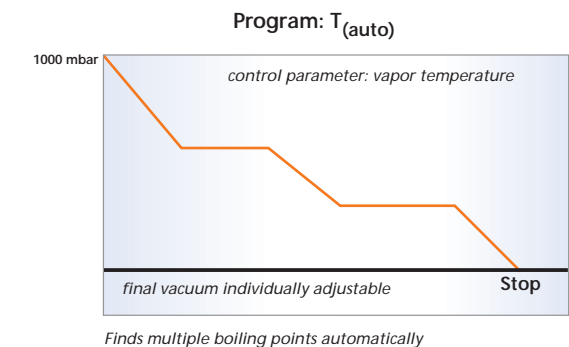


Two programs for your process control

$P_{(const)}$: Program for solvent separations. This program holds a set vacuum constant and uses a hysteresis



$T_{(auto)}$: Supports very precise automatic pressure control for solvent evaporation and separations. It is able to identify multiple boiling points automatically by reducing vacuum by use of a vapor temperature system. $T_{(auto)}$ guides the vacuum control by adjusting valve reaction time to reflect the solvent vapor front collecting on the condenser to yield sustainable distillation. This unique program gives operator ease of use in optimizing the vacuum parameters



PC-Software:

An optional software program allows for all parameter settings and pre-programming ramps via PC. Connect your PC to the RS 232 interface on your LR 20 unit and also save all process data in a digital file (available: 01.06.2010)
P/N 592-51800-00

Laborota 20 compact

For advanced requirements and integrated vacuum control capabilities

This model features identical specifications as the LR 20 safety but for limited budgets comes without these safety aspects:

- Metal frame and safety glass guard hood covering the bath
- High impact PMMA door covering the glassware assembly
- High impact PMMA latching doors which cover the receiving flask cassettes

Large control panel which includes separate bright displays for all process parameters, programmable ramps as described on page 9

Optional fully maneuverable base which features detachable side panels

Two bath configurations: water bath models with temperatures up to 100 °C and oil bath models with temperatures up to 180 °C available



Laborota 20 compact with water bath and glassware set R (without base unit)
P/N 518-21100-00

Laborota 20 eco

For standard distillations without vacuum control

Operating panel for standard process parameters: Large, analog dial controls for speed and bath temperature. The digital display gives read out of speed and temperature

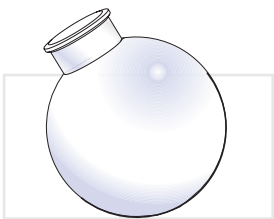
Universal heating bath allows for both water and oil and reaches a temperature of 180 °C

Can be combined with an optional, fully maneuverable eco base unit without side panels

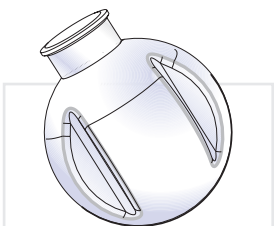


Laborota 20 eco with glassware set R (without base unit)
P/N 518-31300-00

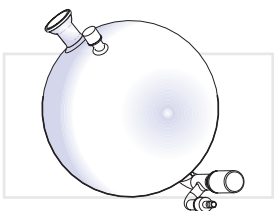
Accessories - Laborota 20



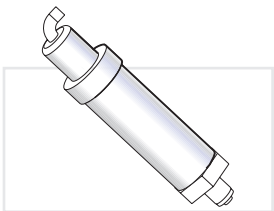
Evaporating flasks	P/N
Evaporating flask 6 liters	15-300-003-20
Evaporating flask 10 liters	15-300-003-16
Evaporating flask 20 liters (included as a standard)	15-300-003-17



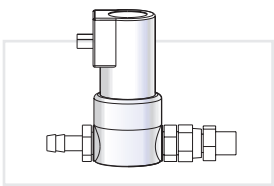
Powder flasks	P/N
Powder flask 10 liters	15-300-003-18
Powder flask 20 liters	15-300-003-19



	P/N
Receiving flask with drain valves 10 liters	15-300-004-11

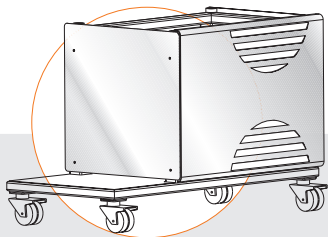


	P/N
Vacuum sensor (included as a standard for LR 20 compact, safety and automatic)	591-21000-00

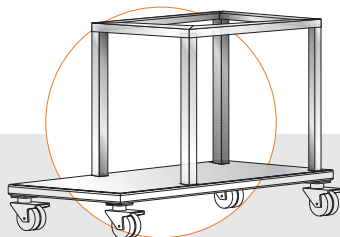


	P/N
Vacuum valve (included as a standard for LR 20 compact, safety and automatic)	591-20000-00

	P/N
Heating bath liquid 5 liters	515-31000-00
Tube set	591-34000-00
PC-Software program for LR 20 safety, compact and automatic	592-51800-00



Base for Laborota 20 compact, safety or automatic
P/N 591-23000-00



Base for Laborota 20 eco
P/N 591-23300-00



Vapor temperature sensor
P/N 14-014-003-06

Automated 24 h Distillation

Laborota 20 automatic

Large scale evaporator designed for unattended use. The required solvent is automatically refilled and condensate continuously drained off. The automatic water bath refill system along with an additional control panel for filling and electronics allow for use over an extended period of time.

- ✓ Designed for 24 h continuous use
- ✓ For unattended overnight and weekend applications
- ✓ Affordable alternative to common 50 and 100 liter evaporators
- ✓ Particularly suitable for solvent processing
- ✓ Reduced exposure to solvent vapor and spills

Every automatic evaporator consists of these components:

- Your choice of an LR 20 model with integrated vacuum sensor and vacuum valve. Automated distillation with constant pressure $P_{(const)}$ or with vapor temperature control $T_{(auto)}$
- 4-head vacuum pump, chemically resistant, rated at 3 m³/h, final pressure 9 mbar, 350 W connection power. Vacuum pump comes with separator and exhaust waste vapor condenser is integrated into system
- Additional operating panel for LR 20 control automatic specific flask refill settings

Distillation process:

Automatic product charging

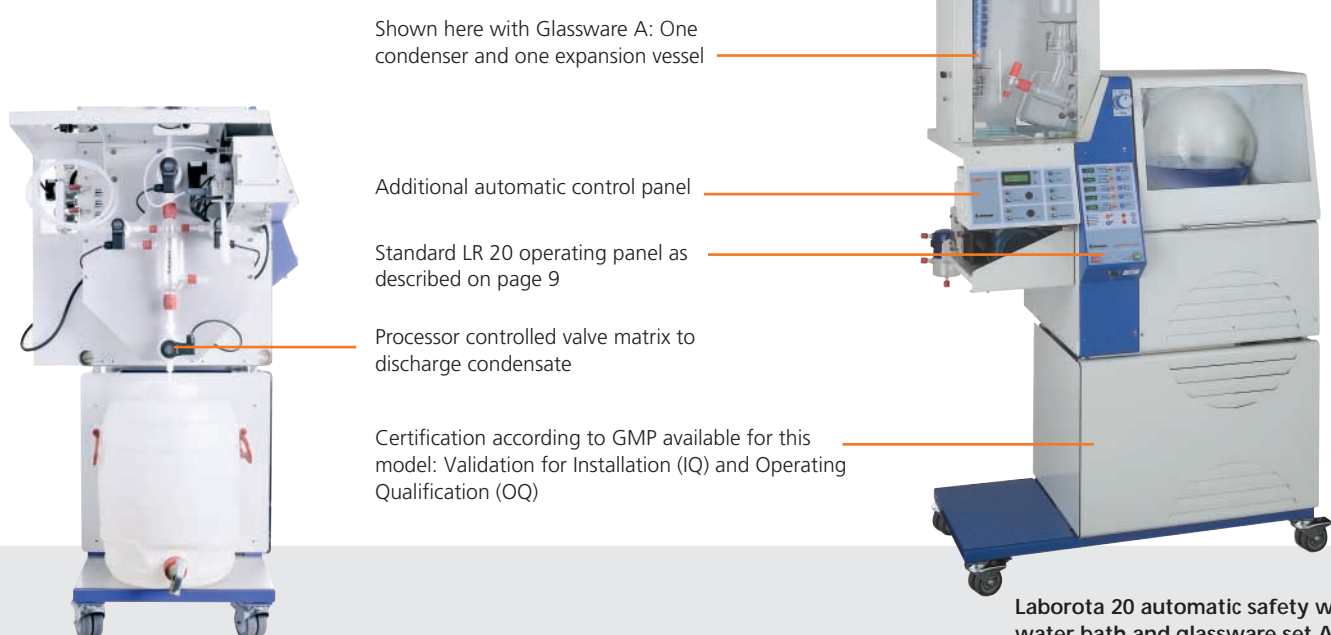
- Drive head features weight sensor which is responsible for refilling the evaporating flask according to the amount of solvent distilled off
- Adjustable max. and min. filling level of evaporating flask
- Charging of product controlled via solenoid valve with the help of the systems vacuum and end fill sensor that indicates solution evaporation is complete

Automatic discharge of condensate

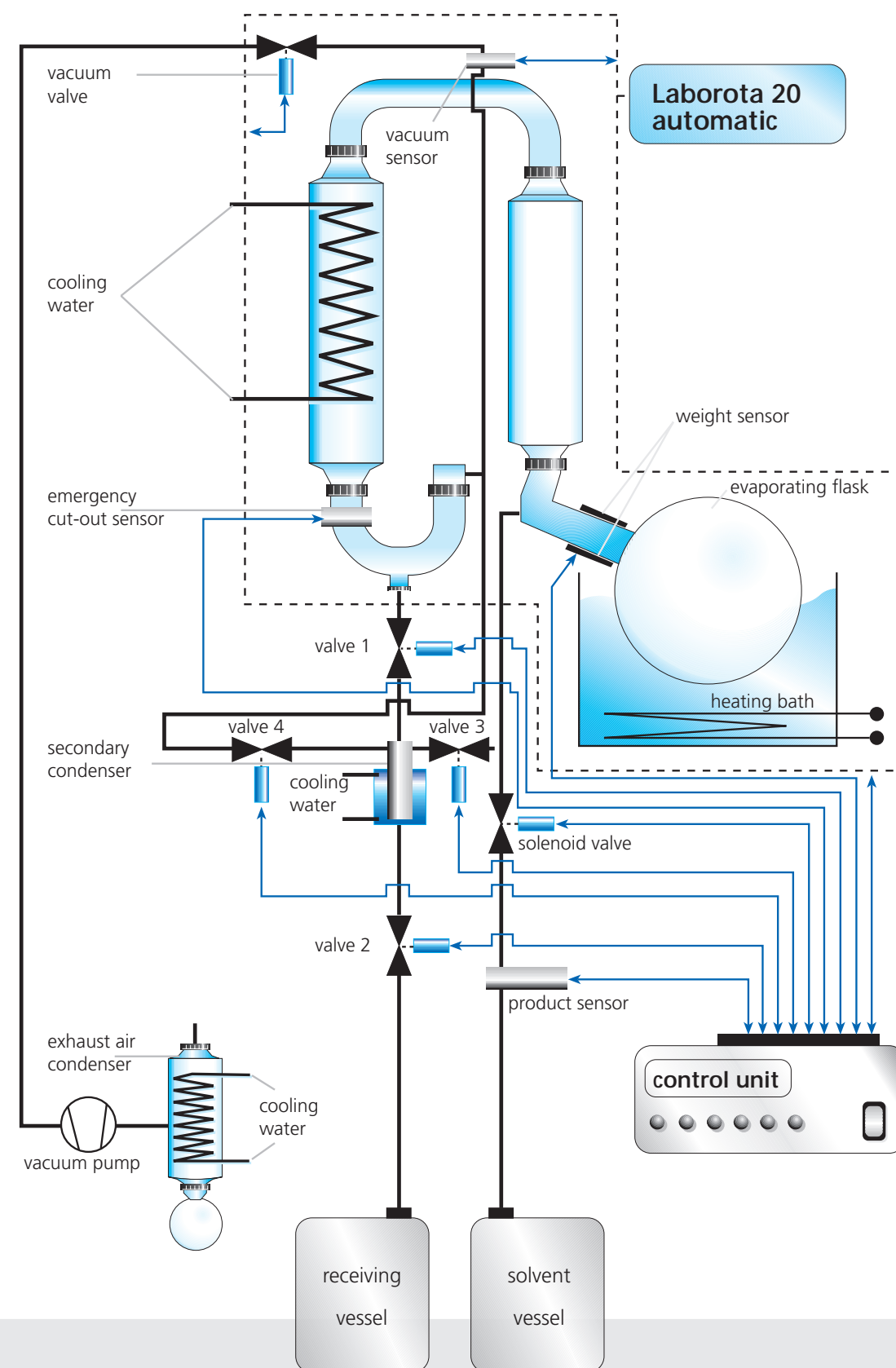
- The discharge from the vacuum system works in a quasi-continuous way. Several times per minute the processor-controlled valve matrix releases out a small volume of condensate

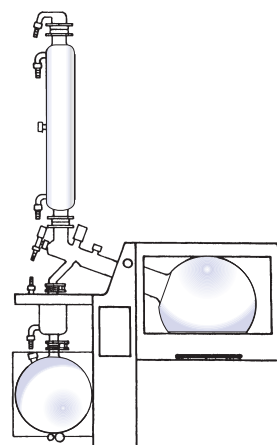
End of distillation

- Termination with the built-in timer
- After reaching an adjustable end pressure (only with $T_{(auto)}$)
- Terminating the distillation by operator



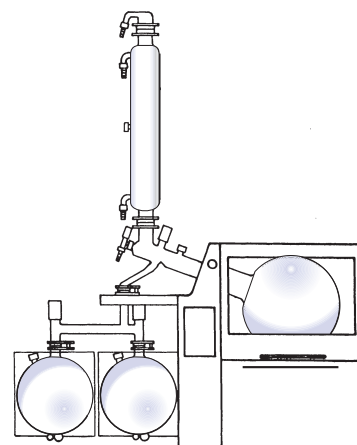
Laborota 20 automatic safety with water bath and glassware set A (without base unit)
P/N 518-17100-00





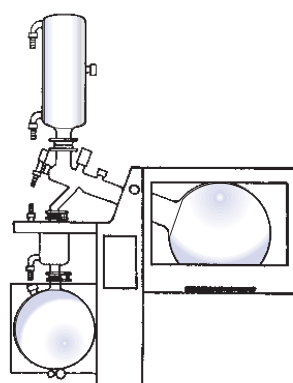
Glassware R

- This glassware assembly includes one ascending condenser, one 20 l evaporating flask, one 10 l receiving flask and is recommended **for all standard distillations**



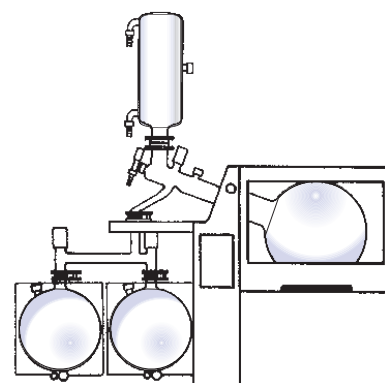
Glassware RC

- Identical to glassware assembly R and features two receiving flasks



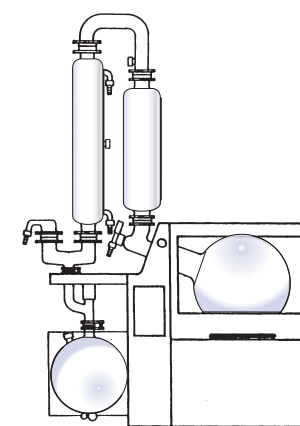
Glassware Shorty R

- Identical to glassware R, but features a condenser that is 320 mm shorter. Distillation capacity remains the same. This is ideal in laboratories for hood applications or where height is restricted



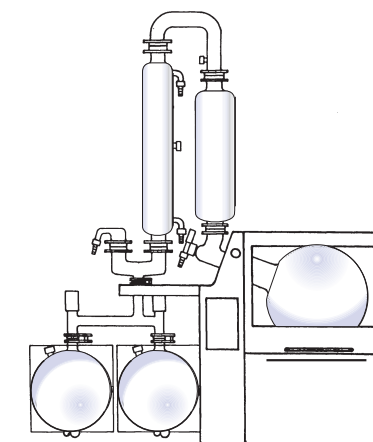
Glassware Shorty RC

- Identical to glassware assembly Shorty R and features two receiving flasks



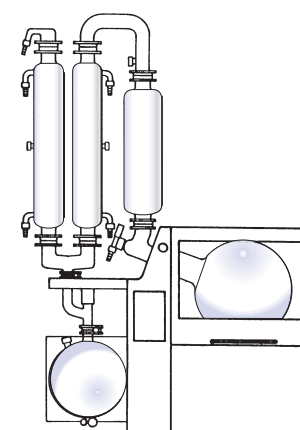
Glassware A

- This glassware assembly includes one descending condenser, one expansion vessel, one 20 l evaporating flask, one 10 l receiving flask and is recommended **for solvents that tend to splash and foam**



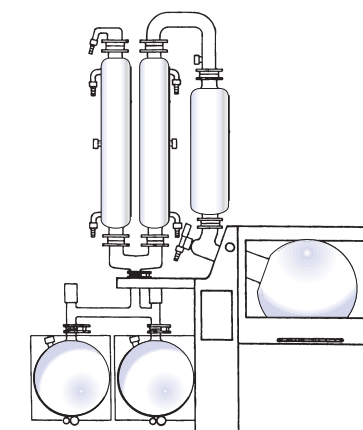
Glassware AC

- Identical to glassware assembly A and features two receiving flasks



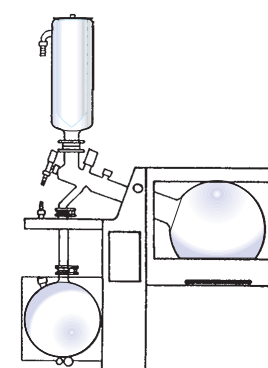
Glassware A2

- This glassware assembly includes one ascending, one descending condenser and one expansion vessel, one 20 l evaporating flask, one 10 l receiving flask **for low-boiling solvents and highest recovery rates**



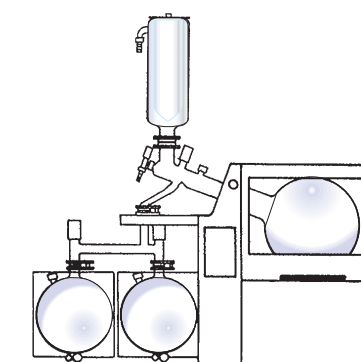
Glassware A2C

- Identical to glassware assembly A2 and features two receiving flasks



Glassware K

- Condensate trap **for low-boiling solvents; cooling by dry-ice**. Comes with one 20 l evaporating flask and one 10 l receiving flask



Glassware KC

- Identical to glassware assembly K and features two receiving flasks

All glassware sets for the Laborota 20 automatic models come without receiving flasks

All glassware sets for the Laborota 20 automatic models come without receiving flasks

Part numbers – Laborota 20

Laborota 20 safety – without base unit

Glassware	Water bath	Oil bath
R	518-11100-00	518-11200-00
Shorty R	518-18100-00	518-18200-00
RC	518-12100-00	518-12200-00
Shorty RC	518-19100-00	518-19200-00
A	518-13100-00	518-13200-00
AC	518-15100-00	518-15200-00
A2	518-14100-00	518-14200-00
A2C	518-16100-00	518-16200-00
K	518-18102-00	518-18202-00
KC	518-19102-00	518-19202-00



Laborota 20 automatic – without base unit

Glassware	Water bath	Oil bath
Safety version		
A	518-17100-00	518-17200-00
A2	518-17101-00	518-17201-00
Compact version		
A	518-27100-00	518-27200-00
A2	518-27101-00	518-27201-00



Laborota 20 compact – without base unit

Glassware	Water bath	Oil bath
R	518-21100-00	518-21200-00
Shorty R	518-28100-00	518-28200-00
RC	518-22100-00	518-22200-00
Shorty RC	518-29100-00	518-29200-00
A	518-23100-00	518-23200-00
AC	518-25100-00	518-25200-00
A2	518-24100-00	518-24200-00
A2C	518-26100-00	518-26200-00
K	518-28102-00	518-28202-00
KC	518-29102-00	518-29202-00

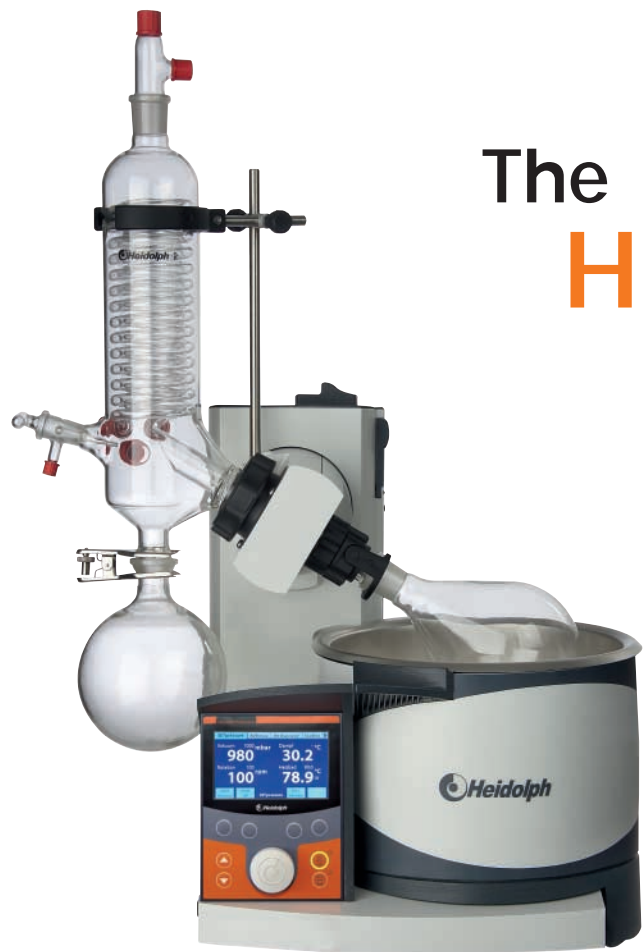


Laborota 20 eco – without base unit

Glassware	Heating bath for water & oil
R	518-31300-00
Shorty R	518-38300-00
RC	518-32300-00
Shorty RC	518-39300-00
A	518-33300-00
AC	518-35300-00
A2	518-34300-00
A2C	518-36300-00
K	518-38302-00
KC	518-39302-00




Intelligent Evaporation?



The
Hei-VAP
Series!

Heidolph Instruments offers you a complete system available from one manufacturer. All components are designed to function together perfectly – that guarantees smooth, safe and efficient operation.

This is what we mean by „Research made easy“– to help you concentrate on research, with your findings, your company and millions of people worldwide in mind.

 Call us for a no obligation demo



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