# Industrial Evaporation

## The next generation


en

# Quality that has impressed for decades

**For more than 50 years the rotary evaporators from Büchi Labortechnik AG have focused on ease of use, durability and quality. For this reason, 20-year-old instruments can still be found in pharmaceutical and chemical laboratories all over the world. Such expectations to meet high quality standards are also found within industrial rotary evaporation line. For these reasons and Buchi's promise to continue to deliver quality instrumentation, trust that the processing of your valuable products will deliver unbeatable results with the Buchi Rotavapor.**

# The perfect Rotavapor for every laboratory



**The industrial Rotavapors were developed to be of universal application, covering an almost endless range of applications. Most typically the industrial Rotavapors are used in scale-up processes.**

**Typical applications for the industrial Rotavapors are:**

- Concentrations in kilo scale as well as in production
- Recrystallizations
- Drying
- Solvent work-up (cleaning)
- Extractions of plant products

## R-220 SE

The Rotavapor R-220 SE (Second Edition) is a further development of the industry approved Rotavapor R-220. Many proven elements have been carried over from the original R-220. However, a few new features have been introduced in relation to safety and ease of use.

## R-220 EX

The ATEX-compliant version of the R-220 was specially developed for applications in EX zones and is compliant with the extremely stringent ATEX 95 directives. The Rotavapor R-220 EX is suitable for EX zones class 1 and 2, and provides the highest possible safety combined with maximum convenience.

## R-250

Up to 30 liters of solvent can be quickly and safely distilled in the 50-liter evaporating flask for the R-250, and that at a performance of up to 30 liters/hour (applies to acetone).

## R-250 EX

For the distillation of large volumes in EX-protected pharmaceutical production facilities, the R-250 EX is the optimum tool. For this environment, FDA-compliant materials are a necessity.

# Easy, safe, automated processes

**The Buchi Rotavapors feature intuitive operation. Numerous technical features make the industrial Rotavapors safe, robust instruments for continuous use in very demanding environments.**

**Title Feed valve**

Quick or continuous addition of sample without breaking vacuum

**Patented EasyClamp connections**

Secures glass joints quickly, easily and safely


**Patented flask clamp**

Snap action mechanism – quick, easy and safe

**Spring loaded shut-off valves**

Prevents glass breakage


**6” LCD display**

Large informative digital display at a glance

**Integrated vacuum controller**

Easy and reproducible process control

**Manual flask handler**

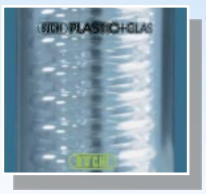
The safest way to carry and mount flasks


**EX protection**

EX versions comply with ATEX 95 directives


**Universal heating bath**

For use with water or oil



**Coated glass**

All units equipped with P+G glass providing maximum user protection

**Warning alarm**

Floating connection for external alarm equipment such as warning buzzer

NEW

**Level sensors**

No more overfilling of the receiving flask

**Foam detector**

Unsupervised operation with foaming products

**Integrated 230 V power supply**

to connect the Vacuum pump V-710

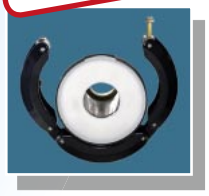
NEW

NEW

**Data storage**

Easy data storage on USB stick

NEW



**FDA compliant materials**

Maximum product assurance

NEW

**Protective enclosure**

Additional safety for the instrument

**Custom units**

Customer specific solutions from Buchi

**Other impressive characteristics:**

**Safe and easy operation**

- Direct access to all glass components
- PTFE base outlet valve for chemical resistant easy emptying
- Front operated bath replenishment to prevent bath from running dry
- Graduated receiving flasks for measurable reproducible results
- Soft starting of the rotation for safer operation

**Process optimization**

- Distillate condenser on all reflux glass assemblies to cool the distillate and reduce to loss of solvent.
- Optional vapor duct with integrated frit prevents glass assembly contamination during powder drying

**Future innovation**

- RS485 and USB connection for the integration of future accessories

You will find detailed information via Internet at www.buchi.com.

# Increase efficiency

**Our industrial rotary evaporators were developed with a focus on efficiency and safety. To increase efficiency there are generally two options. Either increase the distillation capacity through more heating capacity or optimize operation and monitoring to minimize personnel costs. Buchi rotary evaporators have considered and implemented both approaches to increase process efficiency.**

**Distillation capacity**
The optimal combination of heating capacity and cooling area allows for distillation capacities up to 30 liters of acetone/ hour on the R-250 (EX). The R-220 SE also achieves a remarkable 19 liters/hour.

**Operation and monitoring**
The following features make working with the large rotary evaporators easier such that the efficiency and therefore the cost savings is increased.

**Patented flask attachment with snap action mechanism together with manual flask handler**
The evaporating flask can be fastened easily and safely to the Rotavapor by only one person. As a fitting is not used, the following advantages are obtained:

- Quick: – No additional accessory needed to secure joint connection.
- Safe: – No self loosening of the fitting.
  – No fastening parts that can be lost, as the flask attachment is part of the Rotavapor.
  – Safe handling of the flask during transport and during fastening, as the flask cannot roll away.

**Patented EasyClamp connections on glass joints**
The quickest and, at the same time, the safest way to attach and remove glass components.

- Safe: – Very robust material and gentle on glass.
- Quick: – Opening and closing with only 1 screw.

**Vacuum controller**

The integrated vacuum controller on the R-220 SE regulates and optimizes the distillation process with minimal user involvement and supervision. Functions such as Timer, Gradient and Repeat are only three of the special features.

- Safe: – Stable conditions and reproducible processes.
- Dependable: – Tightly controlled settings result in reproducible processes.

NEW

## Optional accessories for time and cost savings

**Foam detector**

The internal PTFE foam sensor detects and breaks down rising foam with a short aeration pulse. Therefore, you can use the foam sensor to eliminate the time consuming monitoring process of extract reduction.

- Efficient: – Reduction in monitoring results in cost savings.

**Level sensors**

Adjustable receiving flask level sensors can monitor various fill levels. As soon as they are full, the Rotavapor switches to a safe state (bath lowered, heater and rotation off).

- Safe: – No overfilling of the receiving flask.
- Dependable: – Measurable concentration.
- Efficient: – Reduced monitoring effort.

NEW


**Data storage**

Particularly in the pharmaceutical industry, saving process data is very important.
The USB module is an option available to save all relevant process data to a USB stick. This data can then be transferred and saved to a PC.

- Safe: – Subsequent process evaluation.
- Efficient: – Process monitoring without personnel costs.

NEW

# Safety without compromises

**There are various features that make the Rotavapor a safe tool for daily distillation tasks in both the laboratory and production.**

**Product assurance**
Maximum protection for thermosensitive products against excessively high temperatures.

- An adjustable upper temperature limit prevents unintentionally change of the setpoint.
- An overtemperture sensor switches the Rotavapor off when setpoint temperature has been exceeded by 15 °C.
- A mechanical over temperature protection feature protects the heater from burning out.

The EX versions have level monitoring which prevent the baths from running dry.

**Automatic bath lowering**
In the event of a problem, the bath is lowered automatically, the heater switches off and the rotation stops.

**Level monitoring for the receiving flasks (optional)**
If the receiving flask is full as indicated by the level sensor, the R-220 SE switches off.

NEW

---

**Process reliability**
Vacuum controller in combination with speed controlled vacuum pump, coolant monitoring and overall precise regulation of the evaporation parameters guarantee reproducible results.

**User protection**
Protection of the operator is of high value with all Buchi instrumentation. This means that even the simplest and most economical Rotavapor offers maximum protection, without having to purchase additional safety equipment.

Standard features include:

- “Plastic+Glas” coating on all glass components with the exception of evaporating flasks and EX versions. This coating offers maximum protection for personnel against implosions and glass breakage without hindering operation.
- Spring-loaded shut-off valves prevent glass breakage as a result of excessive force during closing.
- EasyClamp connections for quick and safe assembly of glass joints .
- Patented evaporation flask clamp allows safe single user operation.

**Instrument protection**

Additional protection of the instruments is often required in production facilities. For this reason a safety shield made of PMMA is available for the R-220 SE; this shield protects the entire glass assembly.

- Unrestricted visibility of the process.
- Front access to the controls via doors.
- The coated glass components ensure the protection of the user even with the doors open.

The pivoting polycarbonate bath shield protects, on the one hand, the evaporating flask and, on the other hand, the user against splashing.

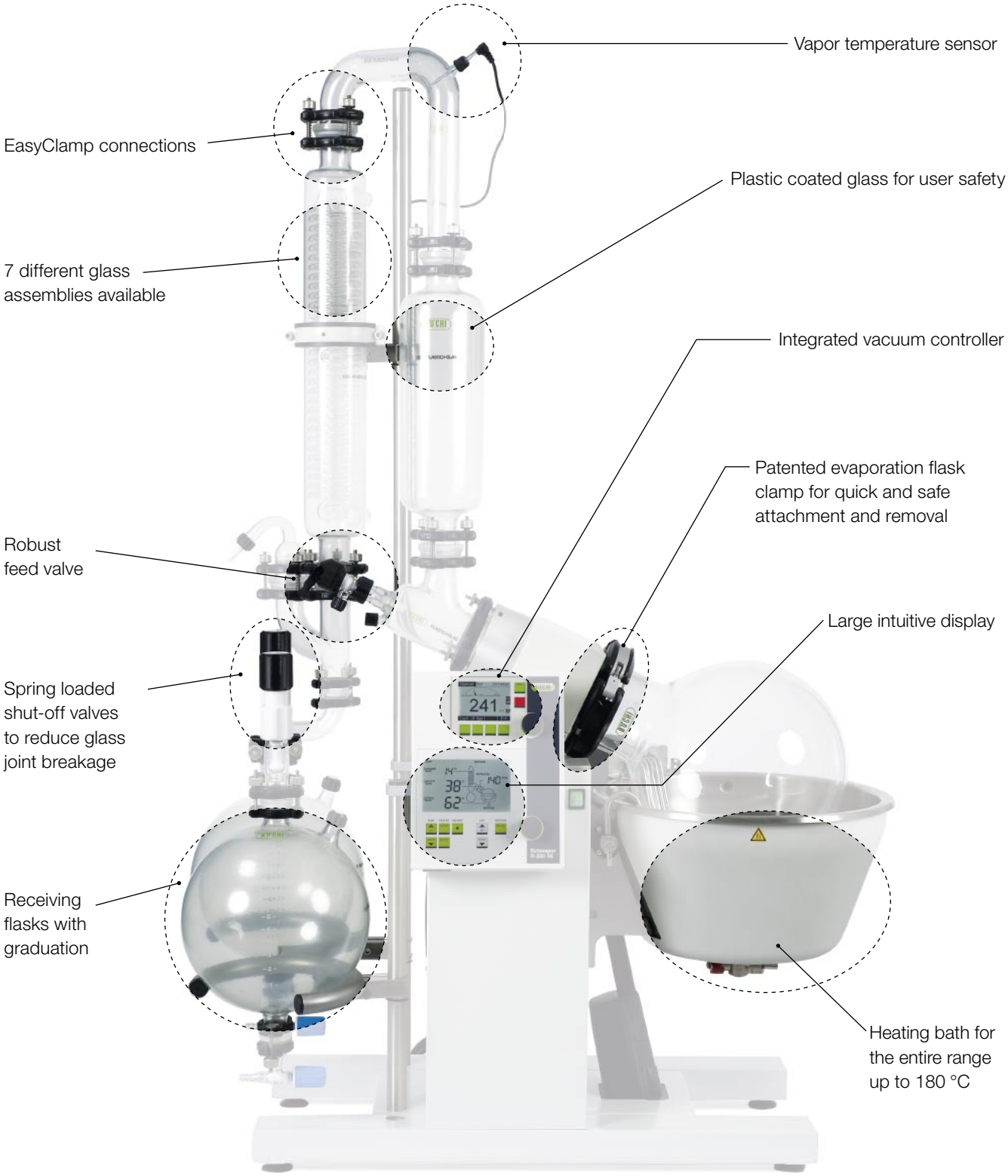
- Transparent shield for continuous visibility of the product throughout the entire evaporation process.
- Pneumatic spring for easy pivoting and retention of the shield.
- Safety feature – rotation stops when shield is open.
- Optional stainless steel cover protects the evaporation flask from above.

A steel tube frame is also available as an accessory that provides additional side protection for the R-220 SE.

# The Rotavapor® R-220 SE is setting new standards

**The Rotavapor R-220 SE (Second Edition) is based on the extremely successful R-220.**

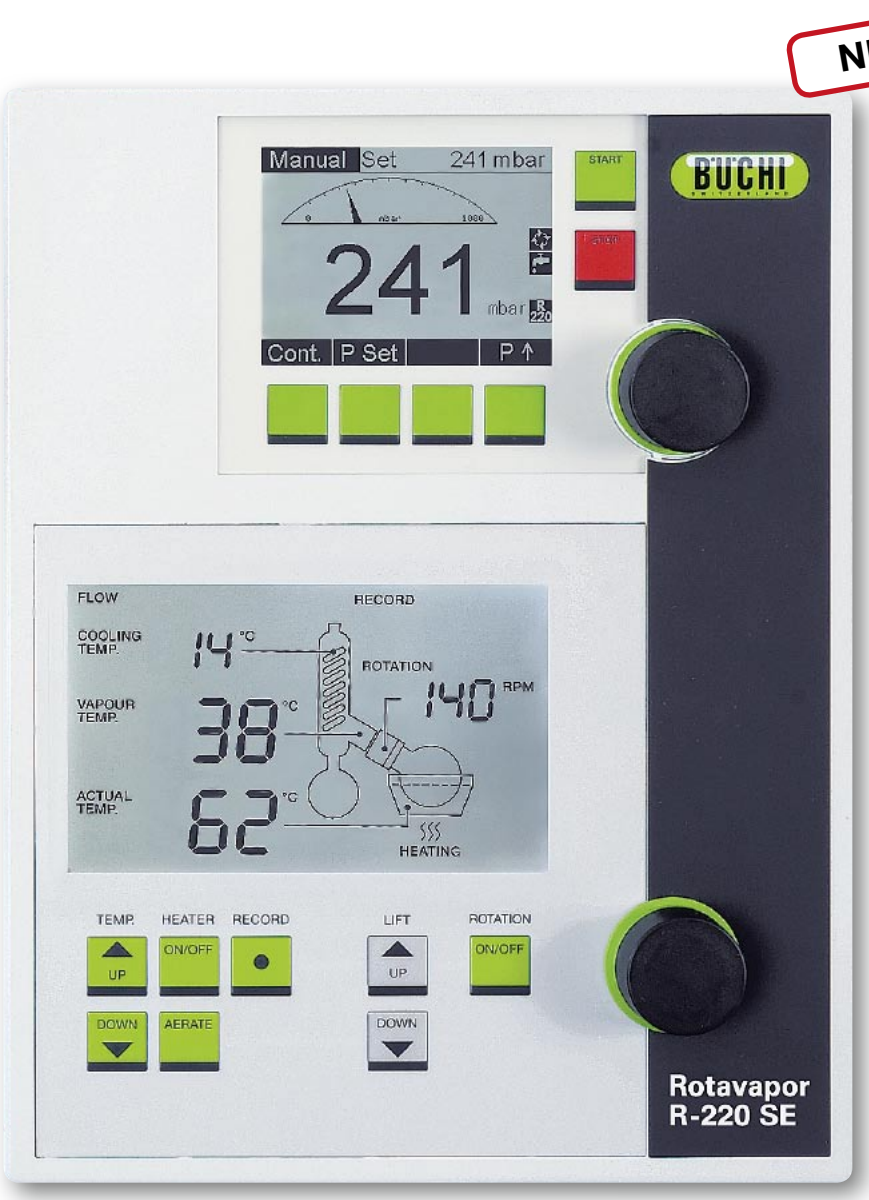
**This new edition R-220 improves upon safety standards and flexibility.**



**The integrated vacuum controller pre-programmed with numerous functions, making distillations quicker, more reproducible and safer.**

**The most important features include:**

- Large display for clear indication of important data
- Control knob allows for simple menu operation
- Accurate pressure control
- Prepare and save gradients for reproducible distillations
- Timer function stopps rotation, bath temperature and lift position after a programmed time is achieved
- Solvent library incorporates bath and coolant temperatures for optimal distillation
- Hysteresis free vacuum settings reduce the occurrence of bumping and foaming

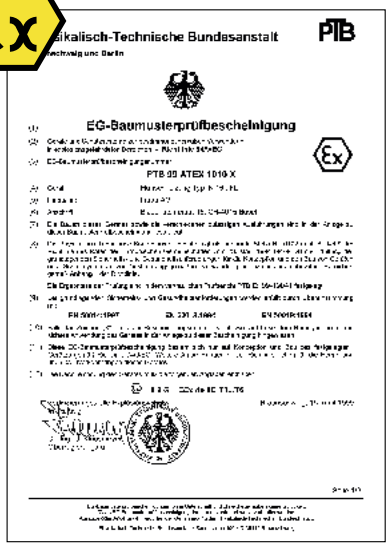



**The large, clearly laid out display makes it possible to monitor the process at a glance. All parameters and settings are displayed to eliminate submenu navigation. These features include:**

- Actual bath temperature
- Vapor temperature
- Coolant temperature (requires optional sensor)
- Cooling status ON/OFF (requires optional sensor)
- Rotation speed (rpm)
- Heating status (ON/OFF)
- Bath shield (OPEN/CLOSED)
- Error messages
- Operating states in the continuous version (filling, emptying, automatic)
- Receiving flask level sensor status
- USB stick data storage activation (RECORD)

# EX protection in accordance with ATEX 95

**Buchi's R-220/250 EX Rotavapors comply with the international standards (IEC and CENELEC) as well as the EC directive 94/9 (ATEX 95). The R-220 EX and R-250 EX Rotavapors support the pharmaceutical and chemical industries, where production under EX protected conditions is often the standard.**


Physikalisch-Technische Bundesanstalt

PTB

EG-Baumusterprüfbescheinigung

PTB 99 ATEX 1010 X

**Special features of the EX versions**

- Hydraulic lift and bath rotation.
- Compliance with the EC directive 94/9 (ATEX 95).
- Maximum bath temperature is 150°C.
- Includes EX protected vacuum controller.
- All glass components are uncoated due to possible static charge.

**Zone classification (workplaces as per ATEX 137)**

Europe: zones 1 and 2 (category 2 G), gas group IIC,
Temperature class T3 or T4 (corresponds in the USA to:
division 1, class 1, group C and D, temperature class T3/T4).

**User friendly operation also on the EX instruments**


*R-220 EX*


*R-250 EX with vacuum controller*

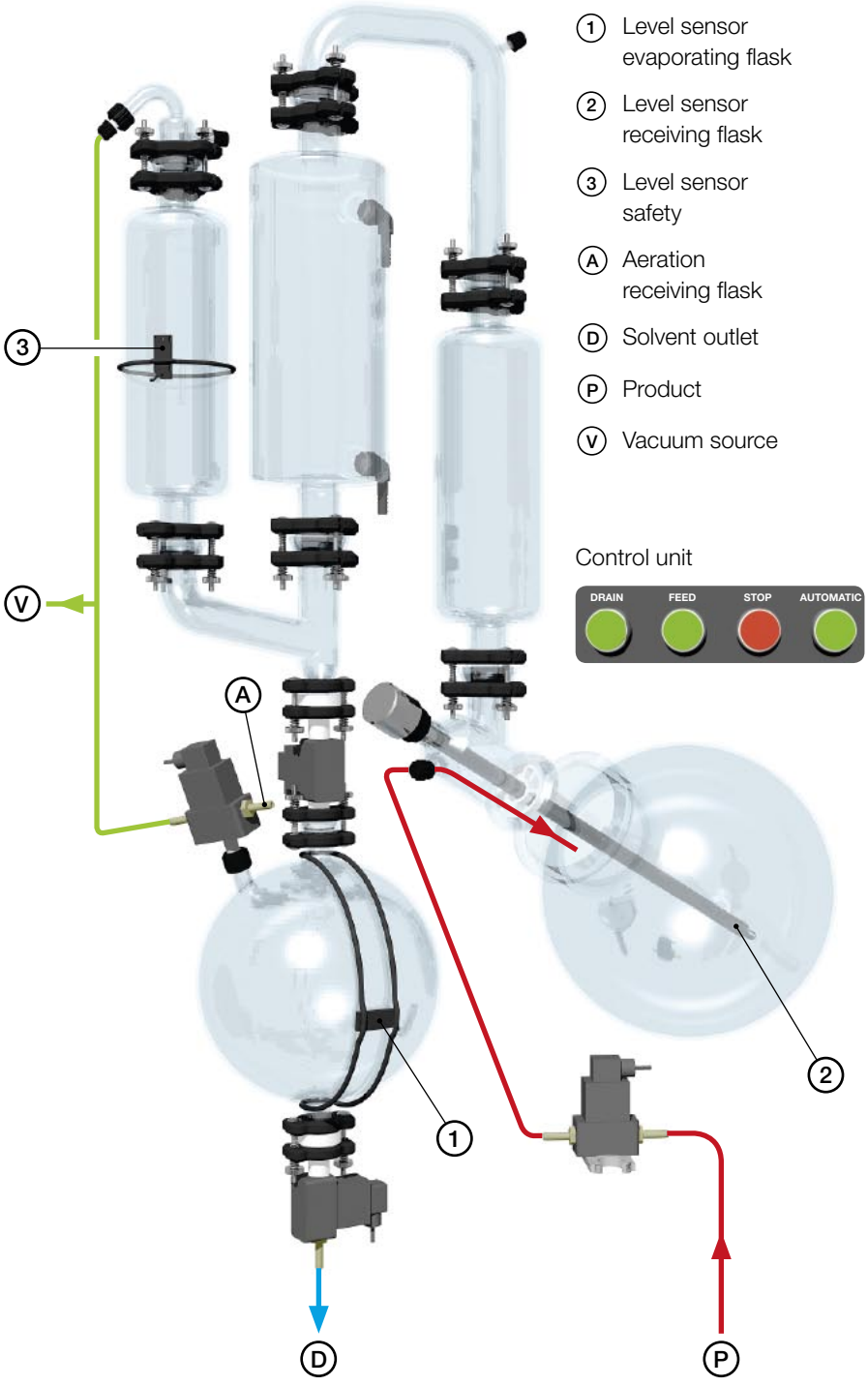
# The continuous option – for uninterrupted operation

**The continuous option allows for the distillation or concentration of several hundred liters of product when using the Rotavapor R-220 SE, R-250 or R-250 EX. These instruments are particularly suitable for solvent recycling or concentrations in industrial preparative chromatography.**

**The principle could not be easier and does not require any programming. The control system takes over the following functions:**

- Automatically empties the receiving flask when full.
- Simultaneously refills the evaporation flask.
- Monitors fill levels in both the evaporating and receiving flasks.
- Controls PTFE fill and drain valves.
- Safety shut down in case fo flooding the system, empty product tank or blocked drain.

- **Quick**
  Continuous concentration in preparative chromatography.
- **Automatic**
  Solvent recycling for large volumes.
- **Flexible**
  Manual and/or continuous operation is possible
- **Safe**
  Monitored with sensors.
- **Dependable**
  Easy operation without programming.

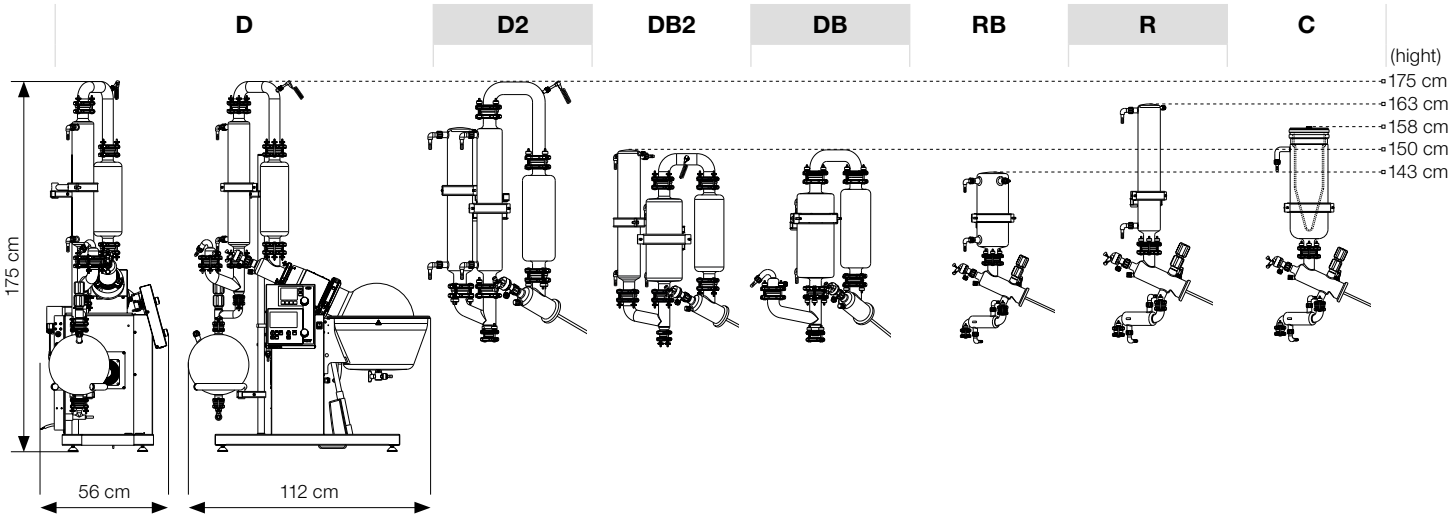


# Maximum performance with the right glass assembly

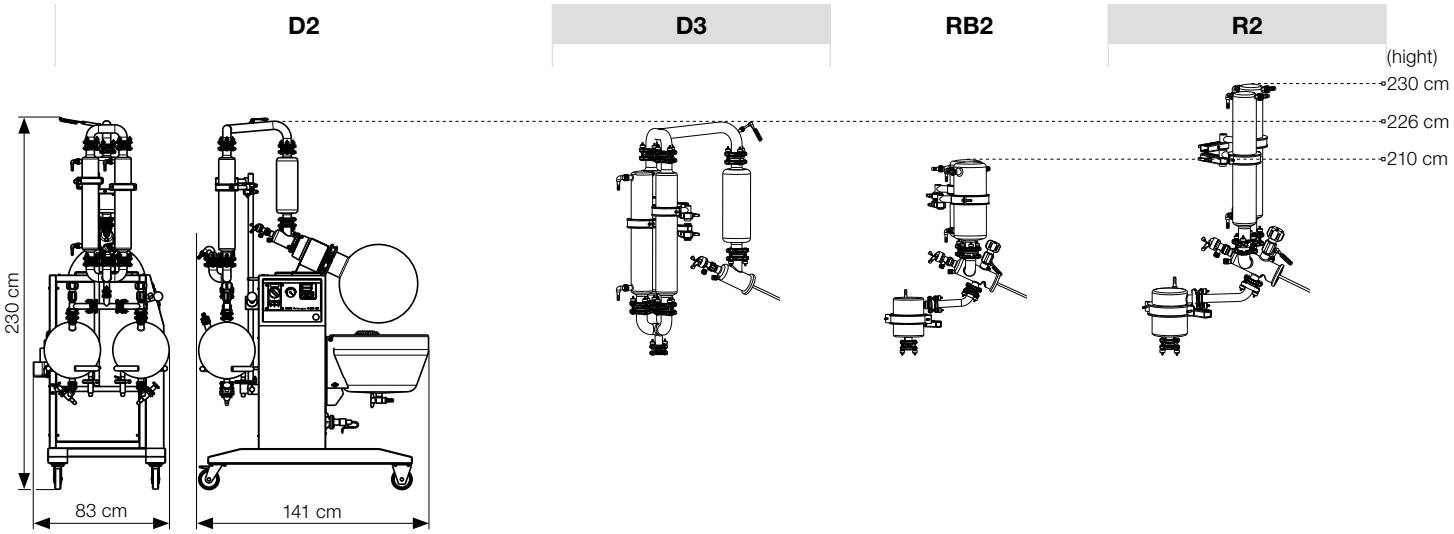
**Numerous glass assemblies and accessories provide a solution for almost every application. Optimal combinations are provided below.**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **R-220 SE / EX** | **D** | **D2** | **DB2** | **DB** | **RB** | **R** | **C** |
| **R-250 / EX** | | **D2** | **D3** | | | **RB2** | **R2** |
| **Use** | Low boiling points and/or foaming products | | | | High boiling points | | Very low bolling point |
| | | Minimum emissions | | | Reflux reactions | | |
| | | | Reduced height | | | | |

**Glass assemblies for the R-220 line**




**Glass assemblies for the R-250 line**

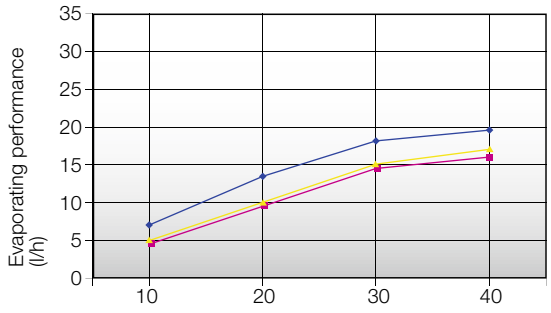


## Application examples

| Application | Example | Glass assemblies | Accessory |
|---|---|---|---|
| Purifying contaminated ethanol | Hospital | D | |
| Concentrating foaming product | Plant extract | D | Foam sensor |
| Thermo sensitive product | Concentration | D2 at low temperature (possibly glass assy. C) | Coolant temperatur sensor |
| Concentration of large volumes | Industrial chromatography | Continuous version | |
| Recrystallization | | R | |
| Drying | | R | Vapor duct with frit |

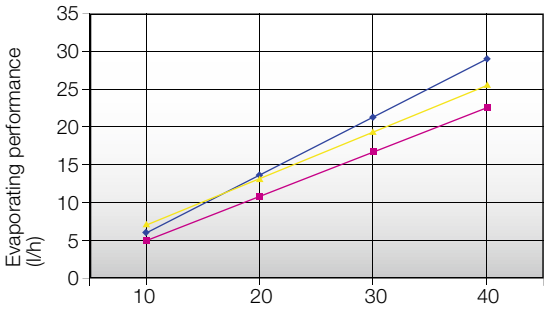
## Evaporating performance

**Impressive evaporating performance R-220/R-220 EX**




*20-liter flask, acetone, 130 rpm*
*10-liter flask, acetone, 130 rpm*
*20-liter flask, acetone, 30 rpm*

**Impressive evaporating performance R-250/R-250 EX**




*50-liter flask, acetone, 100 rpm*
*20-liter flask, acetone, 100 rpm*
*50-liter flask, acetone, 130 rpm*

For other solvents the following maximum general figures apply:

| Solvent | Water | Methanol | Ethanol | Toluene | Ethylacetate | Hexane | Trichlorethane |
|---|---|---|---|---|---|---|---|
| Evaporating performance (liter per hour) R-220 SE | 4.0 | 9.5 | 13.5 | 25.0 | 26.0 | 38.0 | 28.0 |
| Evaporating performance (liter per hour) R-250 | 5.8 | 14.0 | 19.5 | 36.5 | 38.0 | 55.0 | 40.5 |

Temperature difference between bath temperature and boiling point (vapor temperature) = 40 °C

# Accessories R-220 SE and R-220 EX

## Accessories for the R-220 SE

**Vacuum pump V-710**
Speed controlled 3-stage vacuum pump with 4 diaphragm heads, high flow rate of 3.1 m³/h and low ultimate vacuum of 2 mbar.

| | Order no. |
|---|---|
| Vacuum pump V-710 | 72000 |
| with Woulff bottle and secondary condenser | 72011 |

**Trolley**
Trolley made of stainless steel for easy transportation of Rotavapor with shelf space for V-710 vacuum pump. Dimensions W x H x D 850 x 560 x 420 mm.

| | Order no. |
|---|---|
| Trolley for R-220 SE and EX | 41257 |

**Manual flask handler**
Assists in easy mounting and removal of large volume flask along with safe transport and sturdy base for positioning.

| | Order no. |
|---|---|
| Manual flask handler for 20-liter flask for R-220 SE and EX | 41400 |

**Evaporating and drying flasks**
Large flange (inner diameter 120 mm) allows for easy sample removal and cleaning.

| | Order no. |
|---|---|
| 6-liter flask | 27470 |
| 10-liter flask | 27469 |
| 20-liter flask | 27468 |
| 10-liter drying flask | 28592 |
| 20-liter drying flask | 28593 |

**Foam detector**
Internal sensor detects rising foam and triggers a short aeration pulse, eliminating foam

| | Order no. |
|---|---|
| Foam sensor with distribution head cpl. | 11056083 |

**Vacuum valve**
Electrical valve for vacuum regulation when working with house vacuum system or non-Buchi vacuum pump.

| | Order no. |
|---|---|
| Vacuum valve with 10 mm connections | 11055928 |

**Vapor duct**
A special vapor duct with frit P3 protects the condenser assembly against powder and dust during the drying process.

| | Order no. |
|---|---|
| Vapor duct with frit P3 | 41100 |

**Flow monitor**
Checks the flow of coolant, stopping operation when flow of coolant is insufficient or interrupted.

| | Order no. |
|---|---|
| Flow monitor | 11055971 |

**Coolant temperature sensor**
Displays coolant temperature for optimal monitoring of distillation parameters.

| | Order no. |
|---|---|
| Coolant temperature sensor | 11055988 |

**Cooling water valve**
Eliminates uneccessary water waste by stopping cooling water flow when not in use.

| | Order no. |
|---|---|
| Cooling water valve | 41191 |

**Level sensor**
Receiving flask level sensor terminates operation when predetermined waste levels are achieved. Particularly helpful for concentration of product.

| | Order no. |
|---|---|
| Level sensor | 11056192 |

**USB module**
Saves parameters from application runs (temperatures, pressure, rotational speed) on a USB stick for data transfer.

| | Order no. |
|---|---|
| USB module cpl. | 11056175 |

Safety shield for the following glass assemblies, with *one* receiving flask:
D, D2, R, C

| | Order no. |
|---|---|
| Standard safety shield | 11055796 |

Safety shield for the following glass assemblies, with *two* receiving flask:
D, D2, R, C

| | Order no. |
|---|---|
| standard safety shield, two flasks | 11055797 |

Safety shield for the following glass assemblies, with *one* receiving flask:
DB, DB2, RB

| | Order no. |
|---|---|
| Safety shield, Bullfrog | 11055798 |

Safety shield for the following glass assemblies, with *two* receiving flask:
DB, DB2, RB

| | Order no. |
|---|---|
| Safety shield, Bullfrog, two flasks | 11055799 |

Separate bath shield complete

| | Order no. |
|---|---|
| Bath shield cpl. | 11055364 |

Protects the glass assembly and the bath against falling objects (only in conjunction with corresponding safety shield)

| | Order no. |
|---|---|
| Protective grid cpl. | 11056081 |

Reinforced steel tube frame

| | Order no. |
|---|---|
| Bullbar cpl. | 11056082 |

## Accessories for the EX protected R-220 EX

**ATEX compliant diaphragm vacuum pump**
EX area compliant pump achieves a flow rate of 3.7 $m^3$/h and ultimate vacuum of 3 mbar. Complete with separator (not sure what this is) and secondary condenser.

| Order no. | |
|---|---|
| Vacuum pump MD 4C EX 230 V/50 Hz | 40197 |

**Trolley**
Trolley made of stainless steel for easy transportation of Rotavapor with shelf space for V-710 vacuum pump. Dimensions W x H x D 850 x 560 x 420 mm.

| | Order no. |
|---|---|
| Trolley for R-220 SE and EX | 41257 |

**Manual flask handler**
Assists in easy mounting and removal of large volume flask along with safe transport and sturdy base for positioning.

| | Order no. |
|---|---|
| Manual flask handler for 20-liter flask for R-220 SE and EX | 41400 |

**Evaporating and drying flasks**
Large flange (inner diameter 120 mm) allows for easy sample removal and cleaning.

| | Order no. |
|---|---|
| 6-liter flask | 27470 |
| 10-liter flask | 27469 |
| 20-liter flask | 27468 |
| 10-liter drying flask | 28592 |
| 20-liter drying flask | 28593 |

**Safety shield**
Pivoting stainless steel shield protects both user and flask

| | Order no. |
|---|---|
| Safety shield for the EX area | 46431 |

**Only accessories with this symbol are to be used in EX zones.**

# Accessories R-250 and R-250 EX

## Accessories for the Rotavapor R-250/R-250 EX


**Vacuum controller V-850/855**
Display, control and regulation of vacuum. Includes solvent library and timer function, with additional gradient mode on the V-855.

| | Order no. |
|---|---|
| Vacuum controller V-850 for the R-250 | 47293 |
| Vacuum controller V-855 for the R-250 | 47292 |

**Vacuum valve**
Electrical valve for vacuum regulation when working with house vacuum system or non-Buchi vacuum pump.

| | Order no. |
|---|---|
| Vacuum valve for R-250 | 31355 |

**Vacuum pump Sogevac SV 40**
Rotary vane oil vacuum pump with gas ballast valve. Flow rate 40 m³/h with an ultimate pressure of < 2 mbar.

| | Order no. |
|---|---|
| Vacuum pump SV 40 | 34063 |

**Foam detector**
Internal sensor detects rising foam and triggers a short aeration pulse, eliminating foam

| | Order no. |
|---|---|
| Foam sensor with distribution head cpl. | 40507 |

**Splash protector**
A polycarbonate splash protector mounted on the edge of the bath, protects against splashing from the rotating flask.

| | Order no. |
|---|---|
| Splash protector for R-250 | 41420 |

**Vapor duct with frit P3**
This special vapor duct protects the condenser assembly against powder and dust during the drying process.

| | Order no. |
|---|---|
| Vapor duct with frit P3 | 41100 |

**Flask handler crane**
With the folding crane and the 50 L manual flask handler (included) the glass flasks are conveniently and safely secured and transported.

| | Order no. |
|---|---|
| Flask handler crane for R-250 | 41494 |
| Flask handler crane for R-250 EX | 41493 |

**Evaporating and drying flasks**
With large opening (inner diameter 120 mm) for easy sample taking and cleaning.

| | Order no. |
|---|---|
| 20-liter flask | 41432 |
| 50-liter flask | 41339 |
| 20-liter drying flask | 41393 |
| 50-liter drying flask | 41394 |

**Manual flask handler**
Assists in easy mounting and removal of large volume flask along with safe transport and sturdy base for positioning.

| | Order no. |
|---|---|
| Manual flask handler for 20-liter flasks on R-250 | 41410 |
| Manual flask handler for 50-liter flasks on R-250 | 41414 |

**Vacuum pump MD4C EX**
ATEX compliant diaphragm vacuum pump, oil-free and without sources of ignition for the EX area. The flow rate is 3.7 m³/h with an ultimate pressure of 3 mbar.

| | Order no. |
|---|---|
| Vacuum pump MD4C EX | 40197 |

**Only accessories with this symbol are to be used in EX zones.**

# System solutions

**For optimized distillations, the Rotavapor is paired with supporting equipment for efficient cooling, vacuum control and gradients.**

In addition to vacuum pumps, controllers and sensors, Buchi offers a compatible R-220 SE recirculating chiller. With a cooling performance of 2500 W at 15 °C it's an excellent energy efficient alternative to cooling water.

| | |
|---|---|
| Dimensions (W x H x D): | 45 x 110 x 55 cm |
| Weight: | 72 kg |
| Tank volume: | 20 liters |
| Control range: | –10 °C … 40 °C |
| Power supply: | 230 V/50 Hz |

Order number 40300

# Customized solutions

**If specific applications or physical restrictions do not permit the usage of our standard instruments, Buchi can accommodate a wide variety of custom designs; ranging from a special lid for the evaporating flask to a completely modified rotary evaporator.**

**Example 1:**
**R-250 with low height**

An R-250 with reflux required a reduced height of 190 cm to fit into a laboratory with spacial limitations.

By modifying individual glass components Buchi was able to meet the customer's special requirement.

**Example 2:**
**Lid for sealing the evaporating flask**

A custom polypropylene lid with EPDM O-ring for sealing the evaporating flask is used to protect the product from contaminants.

Order number 42895

**Example 3:**
**Heating bath with suspended cooling coil**

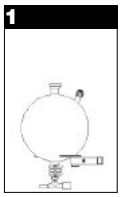
The heating bath was equipped with a suspended cooling to expedite cool down times and eliminate the need to change the bath's contents. The efficient design has two connections for a recirculating chiller. This was used for recrystalization.

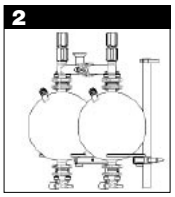
# Order information

### The new Rotavapor® R-220 SE

**1181□□□□□**

- Evaporating flask
  - B 10-liter evaporating flask
  - C 20-liter evaporating flask
  - X Without evaporating flask
- Condensation unit
  - 21 Reflux
  - 22 Reflux Bullfrog
  - 23 Cold trap
  - 24 Descending
  - 25 Descending Bullfrog
  - 26 Descending with secondary condenser
  - 27 Descending Bullfrog with secondary condenser
- Voltage
  - 1 230 V 3.6 kW Heating bath oil and water
  - 2 200 V 3.6 kW Heating bath oil and water
  - 6 400 V 3.6 kW Heating bath oil and water
  - 9 400 V 4.2 kW Water bath
- Vacuum controller
  - 4 V-850
  - 5 V-855
- Collection unit
  - 1 Single receiving flask 10 liter
  - 2 Dual receiving flasks 2 x 10 liter



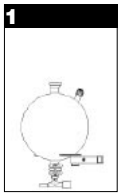

| **R-220 SE for continuous distillation** | Order no. |
|---|---|
| Version 230V 3.6 kW Heating bath oil and water | 118114C291 |
| Version 200V 3.6 kW Heating bath oil and water | 118124C291 |
| Version 400V 3.6 kW Heating bath oil and water | 118164C291 |
| Version 400V 4.2 kW Water bath | 118194C291 |

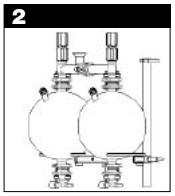
### Rotavapor® R-220 EX

**8□□3□□□□**

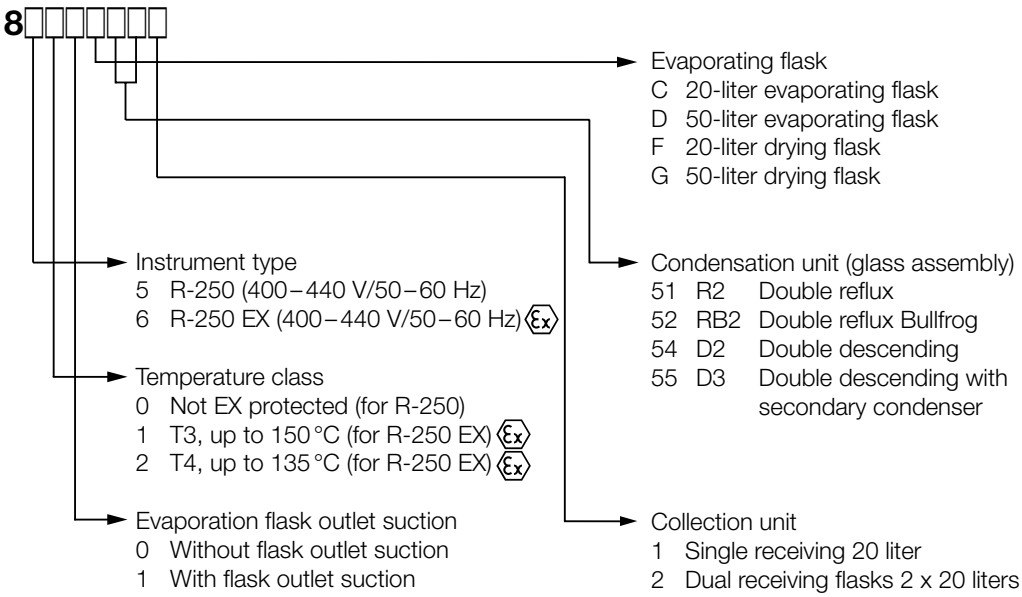
- Evaporating flask
  - A 6-liter evaporating flask
  - B 10-liter evaporating flask
  - C 20-liter evaporating flask
  - E 10-liter drying flask
  - F 20-liter drying flask
- Temperature class
  - 2 T3, up to 150 °C
  - 3 T4, up to 135 °C
- Condensation unit
  - 21 R Reflux
  - 22 RB Reflux Bullfrog
  - 23 C Cold trap
  - 24 D Descending
  - 25 DB Descending Bullfrog
  - 26 D2 Descending with secondary condenser
  - 27 DB2 Descending Bullfrog with secondary condenser
- Voltage
  - 1 230 V 50/60 Hz
  - 2 200 V 50/60 Hz
  - 6 400 V 50/60 Hz

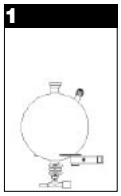
  including EX proof vacuum controller and bath replenishment
- 3 Vacuum controller
- Collection unit
  - 1 Single receiving flask 10 liter
  - 2 Dual receiving flasks 2 x 10 liter

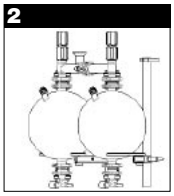


## Rotavapor® R-250 EX




| **R-250 EX for continuous distillation** | Order no. |
|---|---|
| Version T3 up to 150 °C | 8610D580 |
| Version T4 up to 135 °C | 8620D580 |

## Application specific suggestions

| **Standard setup R-220 SE** | | Order no. |
|---|---|---|
| R-220 SE with: | Vacuum pump V-710 | 72000 |
| | Manual flask handler | 41400 |
| | Cooling water valve | 41191 |
| | Trolley | 41257 |
| **Additional for performance optimization** | | Order no. |
| | Coolant sensor | 11055988 |
| | Level sensors | 11056082 |
| **For maximum safety** | | Order no. |
| | Flow monitor | 11055971 |
| | Coolant sensor | 11055988 |
| | Safety shield cpl. | Depending on glass assy. |
| **For GMP** | | Order no. |
| | USB module | 11056175 |
| | Coolant sensor | 11055988 |

# Technical data

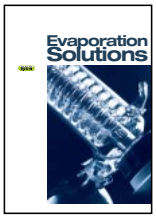
| | R-220 SE | R-250 |
|---|---|---|
| **Distillation capacity (ethanol)** | Up to 13.5 liters/hour 3600 W heater<br>Up to 16 liters/hour 4200 W heater | Up to 19.5 liters/hour |
| **Electrical** | | |
| Voltage | 200 V, 220–240 V (1P, N, G) / 400 V (3P, N, G) | 400–440 V (3P, N, E) |
| Frequency | 50–60 Hz | 50–60 Hz |
| Power consumption | 4200 W | 7500 W–9100 W |
| **Dimensions** | | |
| Height | 1430 mm–1750 mm, depending on glass assy. | 2100 mm–2300 mm, depending on glass assy. |
| Width | 1200 mm | 1410 mm |
| Depth | 510 mm | 780 mm |
| Bath diameter (inner) | 430 mm | 560 mm |
| **Weight** | Approx. 65 kg without glass | Approx. 160 kg without glass |
| **Approvals** | | |
| CE lable | Yes | Yes |
| EX lable | – | – |
| **Safety** | | |
| Bath over temperature protection | – Separate electronic monitoring circuit, mechanical reset<br>– Error if the actual temperature is 15 °C above the setpoint | |
| Bath level monitoring | Not installed | Not installed |
| Rotation | Soft start | Soft start |
| Behavior in case of error | – Bath lowered, heater off, rotation off<br>– Indication of the error<br>– Reset possible | – Bath lowered, heater off, rotation off<br>– Indication of the error<br>– Reset possible |
| **Display** | | |
| Bath temperature | Yes (1 °C steps) | Yes (1 °C steps) |
| Vapor temperature | Yes (1 °C steps) | Yes (1 °C steps) |
| Setting for the rotation speed | Yes (1 rpm steps) | Yes (1 rpm steps) |
| Setting for the bath temperature | Yes (1 °C steps) | Yes (1 °C steps) |
| Actual vacuum | Yes (1 mbar steps) | Optional vacuum controller |
| Setting for the vacuum | Yes (1 mbar steps) | Optional vacuum controller |
| **Cooling** | | |
| Cooling water flow rate | 120–200 liters/hour (variable due to integ. valve) | 200–400 liters/hour (variable due to integ. valve) |
| Limitations | Max. 2.7 bar abs. pulse-free | Max. 2.7 bar abs. pulse-free |
| **Heating** | | |
| Medium | Water or oil | Water or oil |
| Temperature range | Room temperature up to 180° | Room temperature up to 180° |
| Heating power | 230 V 1-phase; 3600 W (3 W/cm2)<br>optional 4200 W (only for water) | 400 V 3-phase; 6600 W (3 W/cm2) |
| Regulation precision | +/– 2 °C | +/– 2 °C |
| **Rotation** | | |
| Motor | 200 V 1-phase; 0.6 A at 50 Hz; 1Nm | 400 V 3-phase; 2 A at 50 Hz; 3 Nm |
| Control | Electronic | Frequency inverter |
| Rotation speed | 5–140 rpm | 5–100 rpm |
| Accuracy | +/– 1 upm at 5 rpm up to +/– 5 rpm at 150 rpm | +/– 1 upm at 5 rpm up to +/– 5 rpm at 100 rpm |
| **Materials** | | |
| Housing | Stainless steel 1.4301 | Stainless steel 1.4301 |
| Gearbox head | Aluminum (3.2373) | Cast aluminum (3.2373) |
| Coating | Powder-coated with Epoxit (EPX) | Powder-coated with Epoxit (EPX) |
| Bath construction | Stainless steel 1.4404 | Stainless steel 1.4404 |
| Heating element | Stainless steel 1.4404 | Stainless steel 1.4404 |
| Glass | Borosilicate 3.3 | Borosilicate 3.3 |
| Product contacting parts | FDA compliant materials | FDA compliant materials |
| **Pressure in the glass assembly** | 0 mbar up to ambient pressure | 0 mbar up to ambient pressure |
| Tightness | < 1 mbar/min. | < 1 mbar/min. |
| **Sensors** | | |
| Vapor temperature | PT-1000, 2-wire | PT-1000, 2-wire |
| Bath temperature | PT-1000, 2-wire | PT-1000, 2-wire |
| Bath level sensor | Not installed | Not installed |
| Pressure | Ceramic, capacitive | Optional vacuum controller |

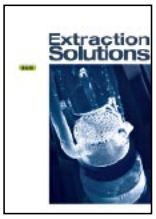
| | R-220 EX | R-250 EX |
|---|---|---|
| **Distillation capacity** | Up to 13.5 liters/hour | Up to 19.5 liters/hour |
| **Electrical** | | |
| Voltage | 200 V, 220–240 V (1P, N, G) / 400 V (3P, N, G) | 400–440 V (3P, N, E) |
| Frequency | 50–60 Hz | 50–60 Hz |
| Power consumption | 4200 W | 7500 W–9100 W |
| **Dimensions** | | |
| Height | 1430 mm–1750 mm, depending on glass assy. | 2100 mm – 2300 mm, depending on glass assy. |
| Width | 1200 mm | 1410 mm |
| Depth | 660 mm | 850 mm |
| Bath diameter (inner) | 430 mm | 560 mm |
| **Weight** | Approx. 75 kg without glass | Approx. 250 kg without glass |
| **Approvals** | | |
| CE lable | Yes | Yes |
| EX lable for Europe | EEx de ia [ia] IIC T3 and T4 | EEx de ia [ia] IIC T3 and T4 |
| **Safety** | | |
| Bath over temperature protection | – Separate electronic monitoring circuit, mechanical reset<br>– Error if the actual temperature is 15 °C above the setpoint | |
| Bath level monitoring | Prevents dry operation of the bath | Prevents dry operation of the bath |
| Rotation | Soft start | Soft start |
| Behavior in case of error | – Heater off<br>– Indication of the error<br>– Reset possible | – Bath lowered, heater off, rotation off<br>– Indication of the error<br>– Reset possible |
| **Display** | | |
| Bath temperature | Yes (1 °C steps) | Yes (1 °C steps) |
| Vapor temperature | Yes (1 °C steps) | Yes (1 °C steps) |
| Setting for the rotation speed | Yes (no display) | Yes (1 rpm steps) |
| Setting for the bath temperature | Yes (1 °C steps) | Yes (1 °C steps) |
| Actual vacuum | Yes (1 mbar steps) | Yes (1 mbar steps) |
| Setting for the vacuum | Yes (1 mbar steps) | Yes (1 mbar steps) |
| **Cooling** | | |
| Cooling water flow rate | 120–200 liters/hour<br>(variable due to integrated valve) | 200–400 liters/hour<br>(variable due to integrated valve) |
| Limitations | Max. 2.7 bar abs. pulse-free | Max. 2.7 bar abs. pulse-free |
| **Heating** | | |
| Medium | Water or oil | Water or oil |
| Temperature range | Room temperature up to 135 °C (T4) or 150 °C (T3) | Room temperature up to 135 °C (T4) or 150 °C (T3) |
| Heating power | 230 V 1-phase; 3600 W (3 W/cm²) | 400 V 3-phase; 6600 W (3 W/cm²) |
| Regulation precision | +/– 2 °C | +/– 2 °C |
| **Rotation** | | |
| Motor | Pneumatic | 400 V 3-phase; 2 A to 50 Hz; 3 Nm |
| Control | Continuous with precision regulator valve | Frequency inverter |
| Rotation speed | 0–100 rpm | 5–100 rpm |
| Accuracy | No display | +/– 1 rpm at 5 rpm up to +/– 5 rpm at 100 rpm |
| **Materials** | | |
| Housing | Stainless steel 1.4301 | Stainless steel 1.4301 |
| Gearbox head | Aluminum (3.2373) | Cast aluminum (3.2373) |
| Coating | Powder-coated with Epoxit (EPX) | Powder-coated with Epoxit (EPX) |
| Bath construction | Stainless steel 1.4404 | Stainless steel 1.4404 |
| Heating element | Stainless steel 1.4404 | Stainless steel 1.4404 |
| Glass | Borosilicate 3.3 | Borosilicate 3.3 |
| Product contacting parts | FDA-compliant materials | FDA compliant materials |
| **Pressure in the glass assembly** | 0 mbar up to ambient pressure | 0 mbar up to ambient pressure |
| Tightness | < 1 mbar/min. | < 1 mbar/min. |
| **Sensors** | | |
| Vapor temperature | PT-1000, 2-wire | PT-1000, 2-wire |
| Bath temperature | PT-1000, 2-wire | PT-1000, 2-wire |
| Bath level sensor | Ultrasonic | Ultrasonic |
| Pressure | Piezoresistive measuring cell;<br>Stainless steel 1.4435 | Piezoresistive measuring cell;<br>Stainless steel 1.4435 |

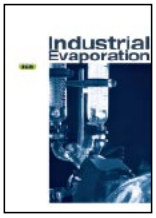
# Buchi products and services

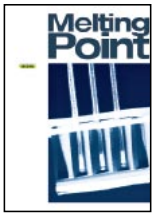
**Buchi provides laboratory equipment for research and development as well as analytical instruments for quality control – worldwide. All our products embody our philosophy of "Quality in your hands". We meet the needs of our customers to the highest degree by developing products and solutions that are robust, well designed, and easy to use.**

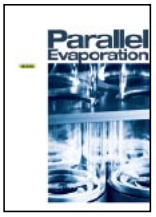
## Buchi products and services:

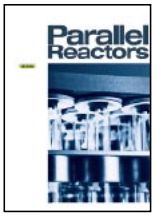


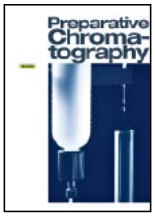


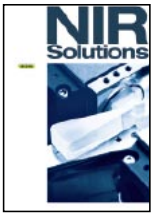














BÜCHI Labortechnik AG
Postfach
9230 Flawil 1
Switzerland
T +41 71 394 63 63
F +41 71 394 65 65
buchi@buchi.com
www.buchi.com

BÜCHI Italia s.r.l.
Centro Direzionale, Milano Fiori
Pal. A-4, Strada 4
20090 Assago (MI)
Italia
T +39 02 824 50 11
F +39 02 57 51 28 55
italia@buchi.com
www.buchi.it

Nihon BUCHI K.K.
3F IMON Bldg.,
2-7-17 Ikenohata, Taito-ku,
Tokyo 110-0008
Japan
T +81 3 3821 4777
F +81 3 3821 4555
nihon@buchi.com
www.nihon-buchi.jp

BUCHI Hong Kong Ltd.
14th Floor South China Building
1-3 Wyndham Street
Central, Hong Kong
China
T +852 2389 2772
F +852 2389 2774
china@buchi.com
www.buchi.com.cn

BÜCHI Labortechnik GmbH
Postfach 10 03 51
45003 Essen
Germany
Freecall 0800 414 0 414
T +49 201 747 490
F +49 201 237 082
deutschland@buchi.com
www.buechigmbh.de

BÜCHI Labortechnik GmbH
Branch Office Netherlands
Postbus 142
3340 AC Hendrik-Ido-Ambacht
The Netherlands
T +31 78 684 94 29
F +31 78 684 94 30
netherlands@buchi.com
www.buchi.nl

BUCHI India
Private Ltd.
201, Magnum Opus
Shantinagar Industrial Area
Vakola, Santacruz (East)
Mumbai 400 055,
India
T +91 22 667 18983 / 84 / 85
F +91 22 667 18986
www.buchi.com

BUCHI Shanghai
570 West Huaihai Road
NO.38 Chuangyi Street
500052 Shanghai
China
T +86 21 6280 3366
F +86 21 5230 8821
china@buchi.com
www.buchi.com.cn

BUCHI Sarl
5, rue du Pont des Halles
Z.A. du Delta
94656 Rungis Cedex
France
T +33 1 56 70 62 50
F +33 1 46 86 00 31
france@buchi.com
www.buchi.fr

BUCHI Corporation
19 Lukens Drive, Suite 400
New Castle
Delaware 19720
USA
T +1 302 652 3000
F +1 302 652 8777
Toll Free: +1 877 692 8244
us-sales@buchi.com
www.mybuchi.com

BUCHI UK Ltd
5 Whitegate Business Centre
Jardine Way
Chadderton
Oldham OL9 9QL
United Kingdom
T +44 161 633 1000
F +44 161 633 1007
uk@buchi.com
www.buchi.co.uk

BUCHI (Thailand) Ltd.,
77/121, Sin Sathon Tower,
28th FL, Unit C
Krungthonburi Rd.
Klongtonsai, Klongsan
Bangkok 10600
Thailand
T +66 2 862 08 51
F +66 2 862 08 54
bacc@buchi.com
www.buchi.com


We are represented by more than 100 distribution partners worldwide. Find your local representative at

www.buchi.com

**Quality in your hands**


092095 en 1002 / Technical data subject to alterations / quality system ISO 9001
The original version is prepared in English and is used as the basis for all translations