



# Rotavapor® R-220 Pro

## Four models to best fit your scale-up needs

The Rotavapor® R-220 Pro family includes four platforms to meet the challenging needs of scale-up and production laboratories: maximum flexibility with the widest variety of glass assemblies, high performance for fastest distillation rates, continuous operation with automatic draining and refilling, and an economical model to cover essential needs.



### Easy and safe

Intuitive user interaction,  
programmable methods  
and safe operation



### Individualized

Compose your system to  
meet your specific needs



### Made to last

Premium quality materials com-  
bined with reliable technology for  
maximum product lifetime



## Rotavapor® R-220 Pro

Key features and advantages



---

Configure your individual Rotavapor® system:  
[www.buchi.com/Rotavapor](http://www.buchi.com/Rotavapor)

---



## Characteristics:



### Intuitive navigation

The combination of the detachable 8.7" capacitive touchscreen and additional navigation and emergency stop hard keys allow for maximum usability and remote control.



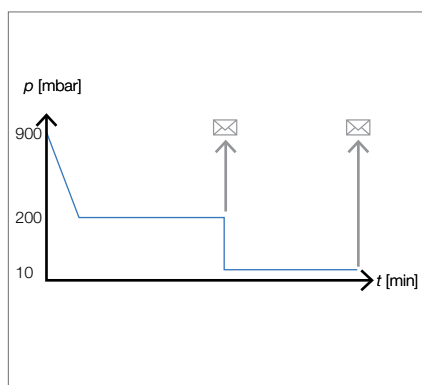
### At one glance

The user-friendly interface gives a comprehensive overview of settings, current readings and progression graphs of relevant process parameters at any time.



### Automatic distillation

Foaming samples are no longer a problem: The AutoDest function and the foam sensor guarantee for safe and automatic distillation even of challenging samples.



### Programmable methods

Customized standard operating procedures (SOPs) provide convenient user guidance through the process and push notifications to mobile phones if attention should be required.



### Maximum safety

Safety features include plastic coated glassware (P+G), over-temperature protection, over-pressure release, bath overflow drain, spring-supported valves for glass breakage prevention as well as remote control and monitoring.



### 24/7 Operation

The robust design and the use of premium quality materials allow for extensive operation under harsh production conditions and guarantee a long product lifetime.

## Remote control and monitoring

### Remote monitoring on mobile devices

The Rotavapor® App is available on iOS, Android and Windows and offers: monitoring of process parameters including charts push notifications in case of an unexpected event or if manual interaction is required emergency stop for administrative users



### Remote control via interface



The detachable interface enables remote control with a 15 m cable for operation in:

- fume hoods
- clean rooms
- or glove boxes

## R-220 Pro: Your most important benefits



### Easy and safe

- User-friendly design with programmable methods guiding through SOPs, automatic distillation even of challenging foaming samples, and remote monitoring on mobile phone with push notifications
- Convenient flask handling with patented BUCHI flask coupling and unique flask handler
- Maximum safety guaranteed by plastic coated glassware (P+G) and additional protection shields and grids



### Individualized

- Four R-220 Pro platforms to match your specific needs: maximum flexibility, highest performance, large volumes or essential demands
- Seven glass assemblies available for various uses, including distillation of foaming samples, recrystallization under reflux and height restrictions
- System extension easily possible with a wide range of accessories, such as automatic foam detection, temperature monitoring, coolant flow control and many more



### Made to last

- Enhanced lifetime through exclusive use of corrosion-free stainless-steel
- No risk of product contamination by use of highly chemical resistant materials
- Seamless 24/7 operation thanks to robust industrial design

## Complete your portfolio



**Interface I-300 / I-300 Pro**  
Convenient process regulation and monitoring



**Vacuum Pump V-600**  
The powerful and silent vacuum source



**Recirculating Chiller F-305 / F-308 / F-314**  
The efficient and water saving way of cooling



**Recirculating Chiller F-325**  
“Support center” for the Rotavapor® R-220 Pro

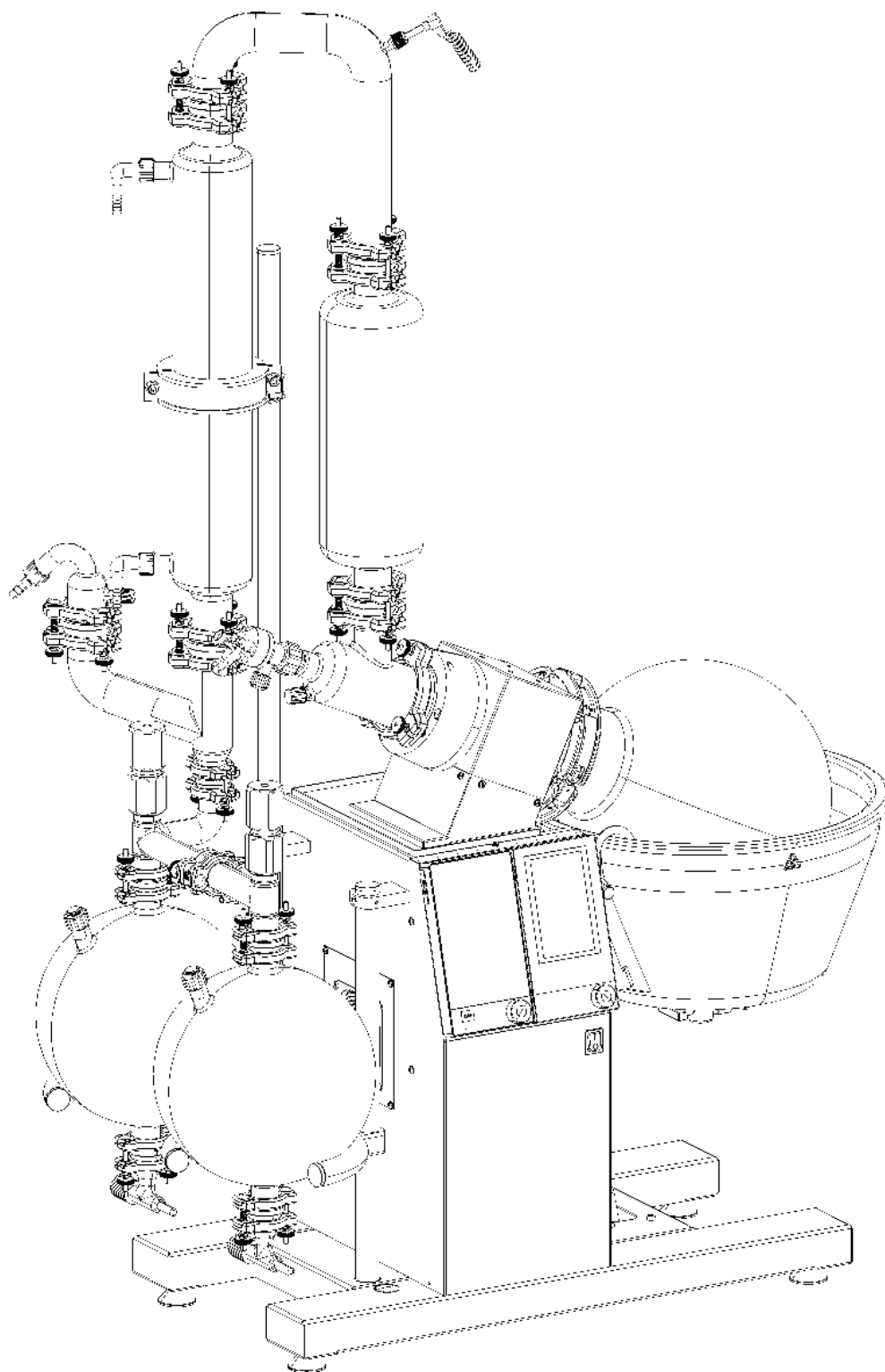




# Rotavapor® R-220 Pro

## Technical data sheet

The Rotavapor® R-220 Pro is designed to fulfill a wide range of distillation applications in the industrial environment. Safety, robustness and easy handling are the key benefits of this system. Seven different glass configurations and a wide range of accessories guarantees the perfect setup for maximum performance.



## Overview

The Rotavapor® R-220 Pro is available in different versions and configurations to cover a broad range of applications. The following table provides a rough overview of the available versions.

R-220 Pro				
	Essential	Basic	High Performance	Continuous
Including vacuum controller		•	•	•
Continuous distillation				•
High distillation rate ( > 16 L Ethanol / h ) *			•	
7 different glass configurations		•		

\* For a comprehensive comparison of the distillation rates, see section "Performance" on page 8.

A wide range of applications can be performed with the R-220 Pro. Nevertheless some versions are specially designed to fulfill specific needs. The following table helps to choose the most suitable version.

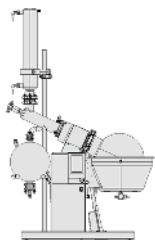
R-220 Pro				
Application	Essential	Basic	High Performance	Continuous
For easy distillable or drying products	++	++	+	-
Heat sensitive products	++	++	+	++
Reflux distillations (e.g. Recrystallization)	-	++	-	-
Continuous distillation (fully automated filling and draining process)	-	-	-	++
Solvent recycling	+	++	++	++
Foaming applications	-	++	+	-
Automatic distillation	-	++	+	-

### Legend:

- +++ : Recommended version that is specially designed for this application
- + : Possible to perform this application, but not optimized for it.
- : not possible or recommended

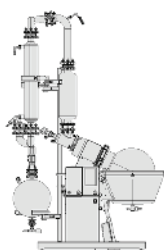
## Glass configurations

Each platform has its glass configuration according to their purpose



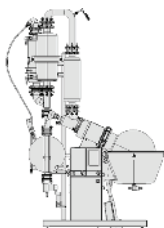
### Rotavapor® R-220 Pro Essential

The “Essential” version is equipped with a vertical condenser and one receiving flask with a volume of 10 L. This configuration covers all the basic distillation needs. It is not recommended for bumping or foaming samples and also distillations under reflux are not possible. Overall height incl. R-220 Pro: 1.70m



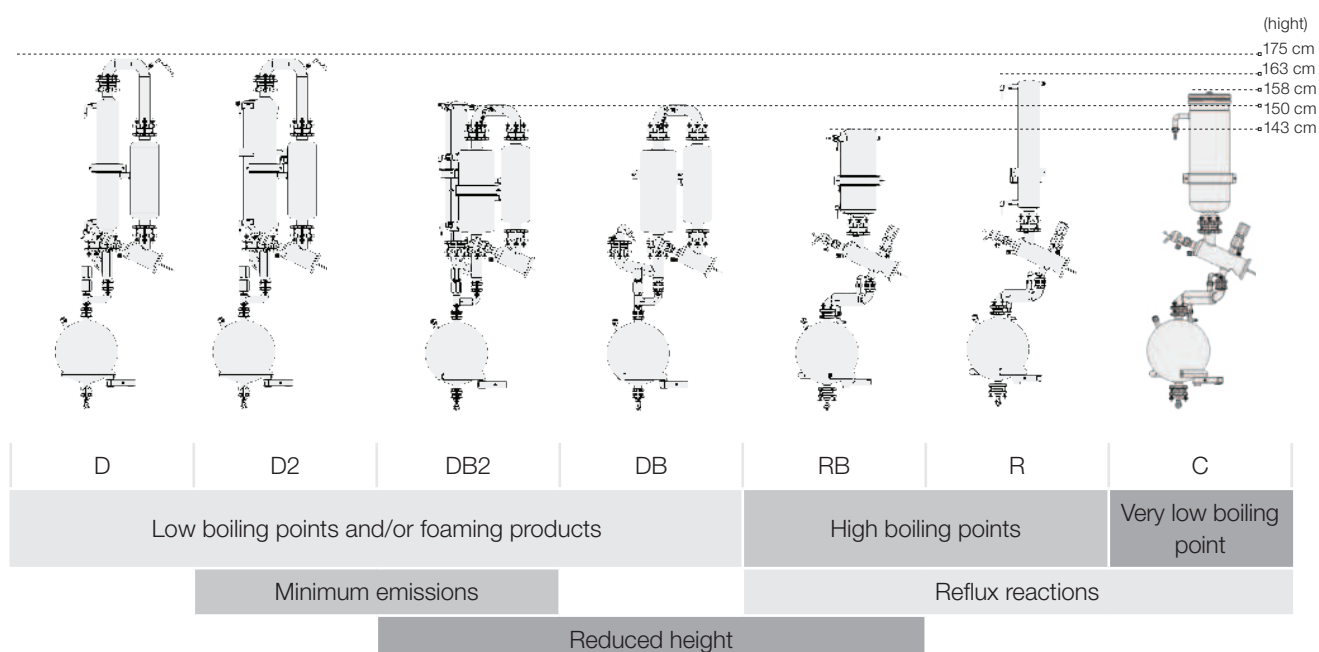
### Rotavapor® R-220 Pro High Performance

The glass configuration of the “High performance” version, consists of two parallel condensers to be able to condense the higher amount of evaporated solvent. Combined with two receiving flasks of 10 L each. Overall height incl. R-220 Pro: 1.80m



### Rotavapor® R-220 Pro Continuous

The “Continuous” setup contains a shorter but equally efficient condenser and one receiving flask. It is based on the descending configuration. For details and further information about the continuous version, see page 12. Overall height incl. R-220 Pro: 1.75m



## Order code

Choose the configuration according to your needs:



### Rotavapor® R-220 Pro

- 1 230 V, 3.6 kW, oil and water
- 2 200 V, 3.6 kW, oil and water
- 6 400 V, 3.6 kW, oil and water
- 9 400 V, 4.2 kW, water bath



### Evaporating flask

- B 10 L evaporating flask
- C 20 L evaporating flask
- X No flask  
6L flask or drying flask (10 L or 20 L)  
has to be ordered separately



### Condenser assembly

- 21 R, reflux
- 22 RB, reflux reduced height
- 23 C, cold trap
- 24 D, descending
- 25 DB, descending reduced height
- 26 D2, descending with secondary condenser
- 27 DB2, descending reduced height with secondary condenser



### Receiver assembly

- 1 One receiving flask
- 2 Two receiving flasks

Rotavapor® R-220 Pro Essential (without Interface I-300 Pro)

1 1 8 7  6 C 2 0 1

Voltage

- 1 230 V, 3.6 kW, oil and water
- 2 200 V, 3.6 kW, oil and water
- 6 400 V, 3.6 kW, oil and water

Rotavapor® R-220 Pro Continuous

1 1 8 7  4 C 2 9 1

Voltage

- 1 230 V, 3.6 kW, oil and water
- 2 200 V, 3.6 kW, oil and water
- 6 400 V, 3.6 kW, oil and water
- 9 400 V, 4.2 kW, water bath

Rotavapor® R-220 Pro High Performance (400 V / 6.3 kW)

1 1 8 7 7 4 C 3 4 2

## Scope of delivery

All Rotavapor® R-220 Pro models are delivered ready to use, including all needed tools and are complete with:

Components	R-220 Pro
Glass configuration according to order configuration	1
Evaporating flask according to order configuration	1
All needed tubing's (vacuum and cooling)	1
Seal removing tool	1
Operation manual	1

## Technical data

	R-220 Pro	R-220 Pro Essential	R-220 Pro Continuous	R-220 Pro High Performance
Dimensions (W x D x H)	1200 x 710 x 1750 mm	1100 x 560 x 1700 mm	1200 x 600 x 1750 mm	1200 x 710 x 1800 mm
Weight	100 kg	85 kg	100 kg	110 kg
Connection voltage	200 VAC (1Ph, N, G) ± 10 % 220 - 240 VAC (1Ph, N, G) ± 10 % 400 VAC (3Ph, N, G) ± 10 %	200 VAC (1Ph, N, G) ± 10 % 220 - 240 VAC (1Ph, N, G) ± 10 % 400 VAC (3Ph, N, G) ± 10 %	200 VAC (1Ph, N, G) ± 10 % 220 - 240 VAC (1Ph, N, G) ± 10 % 400 VAC (3Ph, N, G) ± 10 %	- - - 400 VAC (3Ph, N, G) ± 10 %
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Power consumption (3600 W heater)	5000 W	5000 W	5000 W	-
Power consumption (4200 W heater)	5500 W	-	5500 W	-
Power consumption (6300 W heater)	-	-	-	7500 W
Pollution degree	2	2	2	2
Overvoltage category	II	II	II	II
Approval (200 VAC Connection Voltage)	CE	CE	CE	CE
Approval (220 -240 VAC Connection Voltage)	CE UL / CSA	CE UL / CSA	CE -	CE -

	R-220 Pro	R-220 Pro Essential	R-220 Pro Continuous	R-220 Pro High Performance
Approval (400 VAC Connection Voltage)	CE UL / CSA	CE UL / CSA	CE -	CE -
Rotation Motor	1-phase 0.6 A at 50 Hz 10 Nm	1-phase 0.6 A at 50 Hz 10 Nm	1-phase 0.6 A at 50 Hz 10 Nm	1-phase 0.6 A at 50 Hz 10 Nm
Rotation controlling	Electronically	Electronically	Electronically	Electronically
Rotation speed	5 – 150 rpm	5 – 150 rpm	5 – 150 rpm	5 – 150 rpm
Rotation Accuracy	± 1 rpm at 5 rpm to ± 5 rpm at 150 rpm	± 1 rpm at 5 rpm to ± 5 rpm at 150 rpm	± 1 rpm at 5 rpm to ± 5 rpm at 150 rpm	± 1 rpm at 5 rpm to ± 5 rpm at 150 rpm
Cooling consumption (adjustable via integrated needle valve)	120 – 200 L/h	120 – 200 L/h	120 – 200 L/h	120 – 200 L/h
Cooling restriction abs. without pulsation	max. 2.7 bar	max. 2.7 bar	max. 2.7 bar	max. 2.7 bar
Heating bath medium (3600 W heater)	Water or oil	Water or oil	Water or oil	-
Heating bath medium (4200 W heater)	Water	-	Water	-
Heating bath medium (6300 W heater)	-	-	-	Water
Heating capacity (3600 W heater)	Ambient to 180 °C	Ambient to 180 °C	Ambient to 180 °C	-
Heating capacity (4200 W heater)	Ambient to 100 °C	-	Ambient to 100 °C	-
Heating capacity (6300 W heater)	-	-	-	Ambient to 100 °C
Heating bath accuracy	± 2 °C	± 2 °C	± 2 °C	± 2 °C

## Ambient conditions

For indoor use only.

Max. altitude above sea level	2000 m
Ambient temperature	5 - 40 °C
Maximum relative humidity	80 % for temperatures up to 31 °C decreasing linearly to 50 % at 40 °C

## Safety

Safety coated glassware	Yes, except the evaporating flask
Over temperature protection of the bath	<ul style="list-style-type: none"><li>· Separate monitoring circuit with manual reset</li><li>· Error if temperature is 15 °C above set value</li></ul>
Rotation	<ul style="list-style-type: none"><li>· Soft start</li><li>· Stop in case of blocked rotation</li></ul>
At any Error	<ul style="list-style-type: none"><li>· Bath lowering, heater off, rotation off</li><li>· Type of error showed on display</li><li>· Reset with main switch</li></ul>

## Display

Bath temperature	1 °C steps
Cooling temperature (option)	1 °C steps
Vapor temperature	1 °C steps
Set rotation speed	1 rpm steps
Set bath temperature	1 °C steps
Actual vacuum	1 mbar steps
Set vacuum	1 mbar steps

## Materials

Housing	Stainless steel 1.4301 (AISI 304)
Gear head	Aluminum cast (3.2373)
Paint	Powder coated with Epoxy (EPX)
Bath pan	Stainless steel 1.4404 (AISI 316 L)
Heating element	Stainless steel 1.4404 (AISI 316 L)
Glass	Borosilicate 3.3
In contact with product	FDA compliant materials
Leakage of the complete system	<1 mbar/min

## Sensors

Vapor temperature	PT-1000, 2 wire
Bath temperature	PT-1000, 2 wire
Speed sensor	Hall-sensor
Vacuum	Ceramic, capacitive

## Features R-220 Pro

Two displays	All parameters at a glance on two large displays Always all information available and easy operation at the same time
Easy flask handling	Snap flask coupling to fix the evaporating flask Ensures the safe and easy mounting of the evaporating flask by a single person
Safety coated glass ware	All glass assemblies (except the evaporating flask) are coated with a robust and transparent safety coating To protect the operator from injuries in case of a glass breakage
Indication of process parameters of R-220 Pro	Displays all operating parameters Indicates set and actual values of heating bath and coolant temperature and rotation speed
Dynamic distillation	Distillation process starts immediately after choosing the solvent from the library Starts the distillation immediately and adjusts the vacuum dynamically – even if the chiller or bath have not reached their set temperatures.
Remote control	The Interface I-300 Pro can be removed and used in combination with a 15 m communication cable to remotely control the complete system Enables the Rotavapor® to be operated from a distance or from behind a closed fume hood
Remote monitoring	BUCHI Rotavapor® APP for iOS, Android and Windows offers push notifications and live view of all process parameters Allows to track current status of distillation remotely via smartphones / tablets and informs user when process is terminated
Charting	All parameters are graphically displayed to facilitate the supervision of distillation. With the Rotavapor® App also on your mobile device
Data recording	Process can be exported on an SD card for further analysis and traceability purpose Enables the continuous recording of all process parameters
Wear part library	Internal library lists common wear parts inclusive of order code Allows a convenient replacing process of wear parts and alerts user to check vacuum seal

## Features R-220 Pro

Leak test

Integrated test checks system for possible leaks and displays result

Allows verifying tightness of the system automatically

Different operating modes

Manual vacuum control

- Manual management of pressure settings and aeration

Timer function

- Manual vacuum control, stops process after preset time has elapsed

Continuous pumping

- Pump runs constantly

AutoDest

- Performs automatic multi-stage distillation with specific settings adjusted by the system

Methods (SOP's)

- Performs distillation according to a sequence of programmed steps with defined times and parameters and graphical illustration

Multi-languages

en, de, fr, it, es, zh, ja, ru, pt-br, id, ko

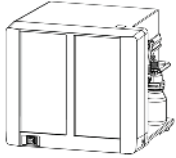
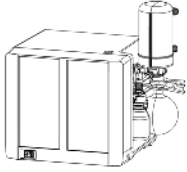
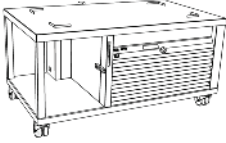
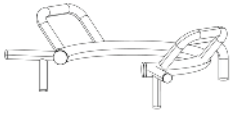
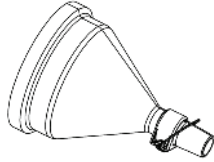
Overpressure prevention

Automatic aeration when pressure is above 1000 - 1300 mbar (adjustable)

ECO-mode

Shuts down activity of bath and chiller, hence lowers energy consumption if system remains inactive for a predefined time period

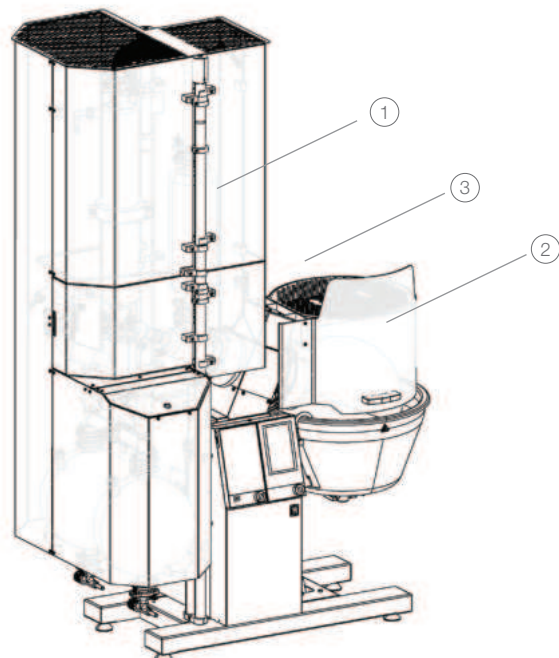
## Accessories

	Order number	
<b>Vacuum Pump V-600</b> Chemically resistant 3-stage diaphragm pump, optimally suited to work with R-220 Pro. It impresses with its silent and economical operation. Capacity and final vacuum: 3.1 m <sup>3</sup> /h, 1.5 mbar	11V600800	
<b>Vacuum Pump V-600</b> Chemically resistant 3-stage diaphragm pump, optimally suited to work with R-220 Pro. It impresses with its silent and economical operation. With secondary condenser. Capacity and final vacuum: 3.1 m <sup>3</sup> /h, 1.5 mbar	11V600810	
<b>Recirculating Chiller F-325</b> Recirculating chiller with a cooling capacity of 2500 W at 15 °C. This chiller is not only cooling the Rotavapor® R-220 Pro but also operates as a trolley and host of the Vacuum Pump V-600. Dimensions are (WxDxH): 1100 x 660 x 560 mm	11F32501	
<b>Manual flask handler for 20 L flask</b> For easy mounting and removal of the flasks along with safe transport.	041400	
<b>Flange adapter for flasks , SJ29.2/32</b> To use a 1, 2 or 3 L evaporating flask with SJ29.2/32	11058738	
<b>Trolley</b> Stainless steel trolley with extra space for Vacuum Pump V-600. Not necessary if utilizing the Recirculating Chiller F-325	041257	
<b>Foam detector assembly</b> Internal sensor detects rising foam and triggers a short aeration pulse, eliminating foam. Only in combination with a descending glass assembly	11056083	
<b>AutoDest sensor cpl.</b> For automatic distillation. Measures temperature of cooling media. Vacuum is adjusted according to cooling capacity of condenser. Meant to be used with the Rotavapor R-220 Pro	11064486	
<b>Vacuum valve, 4 mm, 24 V, connection piece 12.5 mm</b> Electrical valve for vacuum regulation when operated with a non-BUCHI vacuum pump.	11055928	
<b>Vapor duct with integrated sinter plate</b> The integrated sinter plate P3 protects the condenser assembly against powder and dust during the drying process.	041100	
<b>Cooling water flow sensor</b> Checks the flow of coolant, stopping operation when flow of coolant is insufficient or interrupted.	11055971	
<b>Cooling water temperature sensor</b> Needed to display the coolant temperature for optimal distillation settings.	11055988	
<b>Cooling water valve</b> Eliminates unnecessary water waste by stopping cooling water flow when not in use.	041191	
<b>Level sensor for receiving flask</b> For defined concentration of product or to prevent an overflow of the secondary condenser if combined with a Vacuum Pump V-600 with secondary condenser	11056192	

	Order number
Stopper, PE, 120 mm To close the evaporating flask	11057349
Communication cable. BUCHI COM, 15 m, 6p to remote control the R-220 Pro	11064090
IQ/OQ R-220 Pro official BUCHI document	11064749
Repeating OQ R-220 Pro	11064750
Evaporation flask 10 L, amber 10 L flask with UV-protection, flange 150 mm	11069604
Evaporation flask 20 L, amber 20 L flask with UV-protection, flange 150 mm	11069605

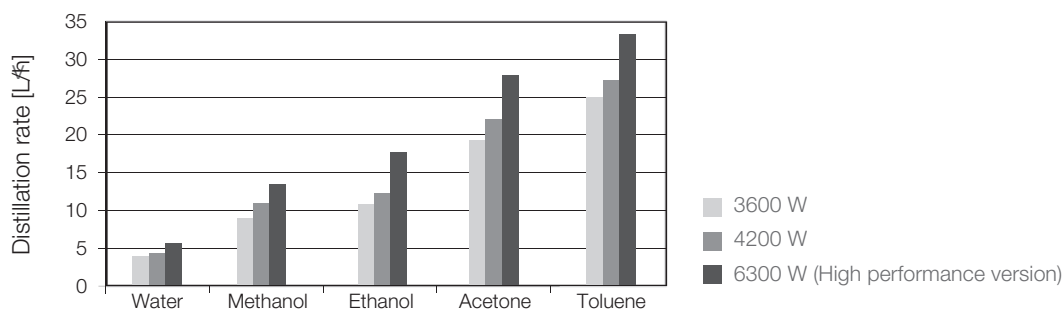
## Safety devices

	Order number	Picture
Standard safety shield Safety shield for the following glass assemblies, with one receiving flask: D, D2, R, C	11055796	①
Standard safety shield, two flasks Safety shield for the following glass assemblies, with two receiving flask: D, D2, R, C	11055797	①
Safety shield, Bullfrog Safety shield for the following glass assemblies, with one receiving flask: DB, DB2, RB	11055798	①
Safety shield, Bullfrog, two flasks Safety shield for the following glass assemblies, with two receiving flask: DB, DB2, RB	11055799	①
Bath shield cpl. Separate bath shield complete	11055364	②
Protective grid cpl. Protects the glass assembly and the bath against falling objects (only in conjunction with corresponding safety shield)	11056081	③



## Performance

The following chart shows the maximum distillation rate of the different R-220 Pro versions



The maximum achievable distillation rate is not just related to the heating capacity, but also on rotation speed, flask size and temperature difference between bath and cooling.

To get a high distillation rate:

- set a high rotation speed
- choose a large evaporating flask (20 L)
- set a high temperature difference between bath and cooling

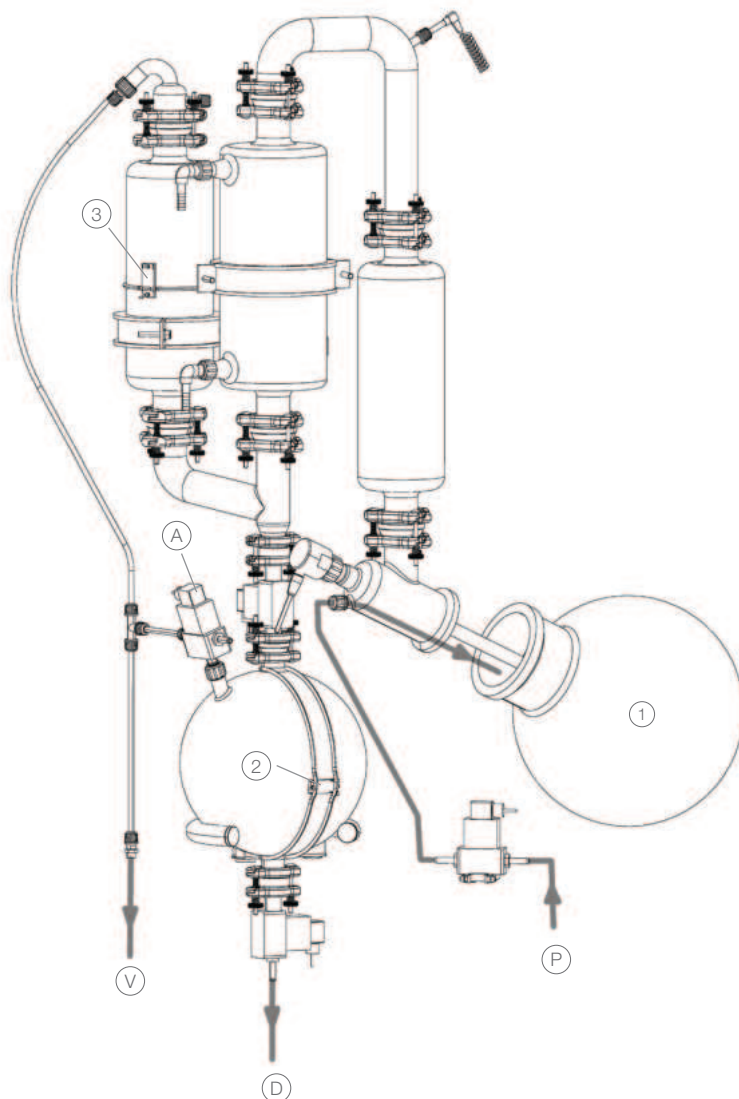
## Functional principle - continuous distillation

The continuous version of the Rotavapor® R-220 Pro is based on the descending glass assembly. Four valves and three sensors are controlling the distillation process. This allows distillations of large volumes almost unattended.

This version is particularly suitable for solvent recycling or concentrations in industrial preparative chromatography.

The system controls the followings functions:

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



- |                                  |                          |
|----------------------------------|--------------------------|
| ① Level sensor evaporating flask | Ⓓ Solvent outlet (drain) |
| ② Level sensor receiving flask   | Ⓟ Product feed           |
| ③ Level sensor safety            | Ⓥ Vacuum source          |
| Ⓐ Aeration receiving flask       |                          |