

Model ROTomaX

- ▶ Cylindrical, vacuum-tight distillation boiler consisting of an insulated dome (stainless steel) with a heating floor (standard steel) flanged to the bottom
- ▶ Insulated, flat heating floor for heating with steam (10 bars, 185°C max.), consisting of a double-walled plate; the floor ensures an excellent heat transfer and full heating capacity regardless of the solvent level in the boiler
- ▶ Steam generator flanged to the heating floor, operated with electric power or with steam or thermal oil from an on-site network. Direct heating of the floor with steam or warm water is also possible
- ▶ Water-cooled stainless steel condenser
- ▶ A rotating scraper system (rotor) prevents deposit build-up on the heating floor, agitates the material to be distilled and keeps the discharge valve clean
- ▶ Dirt-resistant discharge valve, operated manually or pneumatically
- ▶ The unit rests on sturdy frame with stairs at the side and an observation platform
- ▶ The discharge height is adapted to the disposal container and/or a 200-l-barrel (on a pallet). Other heights are possible
- ▶ A viewing glass and an explosion-proof halogen lamp permit operators to observe the distillation process
- ▶ Automatic filling stop when the preselected filling quantity is reached; the process is monitored by load cells that register the total weight of the distillation boiler; filling is stopped by a pneumatic ball valve in the filling line
- ▶ Batch distillation or continuous distillation
- ▶ Control of the heating temperature according to the boiling temperature
- ▶ PLC system and display with readings on heating temperature, filling quantity, refill quantity, residue quantity, distillate quantity, average distillation output and operating hours

Accessories

- ▶ Color monitor with graphic display
- ▶ Vacuum unit for lowering process temperatures, incl. a liquid jet vacuum pump
- ▶ Residue temperature control system for processing of heat-sensitive substances
- ▶ Sealing plate or sealing hood adapted to the on-site disposal container, optionally with an air extraction system
- ▶ Enclosure around the discharge area, including a door; when combined with an air extraction system, this makes it possible to install the unit in an area not protected against explosions
- ▶ Fully automated distillation with automatic residue monitoring in a disposal container monitored by load cells
- ▶ Thermostatic valves if the unit is connected to an on-site cooling/public water system; separate cooling water devices with their own circuits are available as option.



Settings Roto-maX A21

Selection operation mode: **Semi-automatic with emptying** | Actual operation mode: **Semi-automatic with emptying**

Distillation quantity: **1000 lbs** | Filling quantity kettle: **331 lbs**

Delay detection of emptiness: **90 s** | Refill quantity: **11.0 lbs**

Select filling from: **Filling from tank B2 - total emptying**

Build up vacuum before filling distillation kettle: **120 s** | Delay start heating: **900 s**

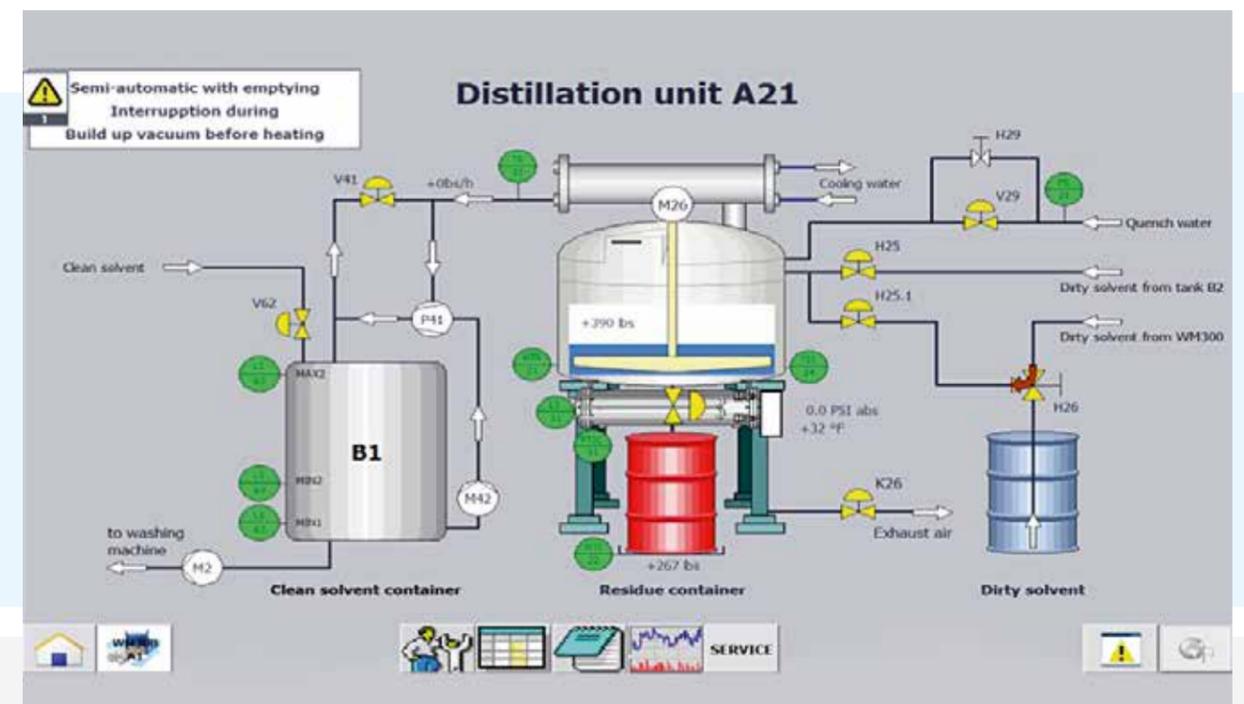
Time lag vacuum: **300 s**

Heating temperature: **284 °F**

Stop performance: **66 lbs/h** | Stop weight in % of distillation quantity: **3 %**

Heat-up time performance control: **120 min** | Max. runtime distilling down: **300 min**

Delay stop distillation: **180 s**



Model ROTomaX

Distillation unit	ROTOmaX 15	ROTOmaX 20	ROTOmaX 30
Capacity l	approx. 50 - 250	approx. 50 - 250	approx. 70 - 400
Boiler capacity l	approx. 350	approx. 450	approx. 750
Distillation output l/h *	approx. 45 - 90	approx. 60 - 120	approx. 90 - 180
Cooling water consumption m ³ /h **	approx. 1.3	approx. 1.7	approx. 2.5
Heating capacity kW	15	20	30
Weight kg **	2200	2300	2500
	W x H x D	W x H x D	W x H x D
Dimensions mm ***	1500 x 3100 x 1900	1500 x 3100 x 1900	1700 x 3200 x 2100
Required space mm	4500 x 3400 x 4000	4500 x 3400 x 4000	4500 x 3600 x 4200
Transport clearance mm	1700 x 2200 x 2000	1700 x 2200 x 2000	1800 x 2400 x 2300

Distillation unit	ROTOmaX 50	ROTOmaX 75	ROTOmaX110
Capacity l	approx. 130 - 650	approx. 200 - 1000	approx. 300 - 1500
Boiler capacity l	approx. 1300	approx. 2000	approx. 3000
Distillation output l/h *	approx. 150 - 300	approx. 225 - 450	approx. 330 - 660
Cooling water consumption m ³ /h **	approx. 4.3	approx. 6.3	approx. 9.5
Heating capacity kW	50	75	110
Weight kg **	2700	3100	3300
	W x H x D	W x H x D	W x H x D
Dimensions mm ***	2000 x 3300 x 2500	2300 x 3500 x 2850	2600 x 3600 x 3150
Required space mm	5000 x 3500 x 4600	5400 x 3700 x 5200	4800 x 3700 x 5500
Transport clearance mm	2100 x 2600 x 2700	2400 x 2850 x 3000	2700 x 2900 x 3300

* Output depends on the solvent

** If water from a public system is used; depends on the water temperature and the boiling point of the solvent; a closed cooling circuit with zero water consumption is possible

*** Standard version without accessories or containers

* Subject to technical changes



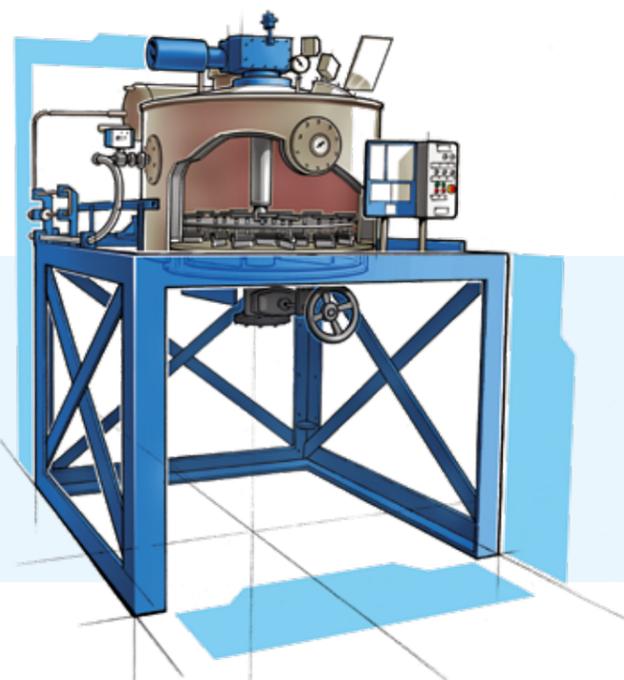
ROTOmaX

Model ROTomaX-e

- ▶ Cylindrical, vacuum-tight distillation boiler consisting of an insulated dome (stainless steel) with a heating floor (standard steel) flanged to the bottom
- ▶ Insulated, flat heating floor for heating with steam (10 bars, 185°C max.), consisting of a double-walled plate; the floor ensures an excellent heat transfer and full heating capacity regardless of the solvent level in the boiler
- ▶ Steam generator flanged to the heating floor, operated with electric power or with steam or thermal oil from an on-site network. Direct heating of the floor with steam or warm water is also possible
- ▶ Water-cooled stainless steel condenser
- ▶ Rotating scraper system (rotor), prevents deposit build-up on the heating floor, agitates the material to be distilled and keeps the discharge valve clean
- ▶ Dirt-resistant discharge valve, operated manually or pneumatically
- ▶ The unit rests on a robust frame
- ▶ The discharge height is adapted to the disposal container and/or a 200-l-barrel (on a pallet). Other heights are possible
- ▶ A viewing glass and an explosion-proof halogen lamp permit operators to observe the distillation process via mirrors
- ▶ Automatic filling stop when the preselected filling quantity is reached; the process is monitored by load cells that register the total weight of the distillation boiler; filling is stopped by a pneumatic ball valve in the filling line
- ▶ Batch distillation or continuous distillation
- ▶ Control of the heating temperature according to the boiling temperature
- ▶ PLC system and display with readings on heating temperature, filling quantity, refill quantity, discharge quantity and distillate quantity

Accessories

- ▶ Vacuum unit for lowering process temperatures, incl. a liquid jet vacuum pump
- ▶ Residue temperature control system for processing of heat-sensitive substances
- ▶ Sealing plate or sealing hood adapted to the on-site disposal container, optionally with an air extraction system
- ▶ Thermostatic valves if the unit is connected to an on-site cooling/public water system; separate cooling water devices with their own circuits are available as option



Distillation unit	ROTOmaX-e 15	ROTOmaX-e 20	ROTOmaX-e 30
Capacity l	approx. 50 - 200	approx. 50 - 250	approx. 70 - 400
Boiler capacity l	approx. 350	approx. 450	approx. 750
Distillation output l/h *	approx. 45 - 90	approx. 60 - 120	approx. 90 - 180
Cooling water consumption m ³ /h **	approx. 1.5	approx. 2.0	approx. 2.5
Heating capacity kW	15	20	30
Weight kg ***	2000	2000	2300
	W x H x D	W x H x D	W x H x D
Dimensions mm **	1500 x 3100 x 1900	1500 x 3100 x 1900	1700 x 3200 x 2100
Required space mm **	4500 x 3400 x 4000	4500 x 3400 x 4000	4500 x 3400 x 4200
Transport clearance mm **	1700 x 2200 x 2000	1700 x 2200 x 2000	1800 x 2400 x 2300
* Output depends on the solvent			
** If water from a public system is used; depends on the water temperature and the boiling point of the solvent; a closed cooling circuit with zero water consumption is possible			
*** Standard version without accessories or solvent containers			

* Subject to technical changes



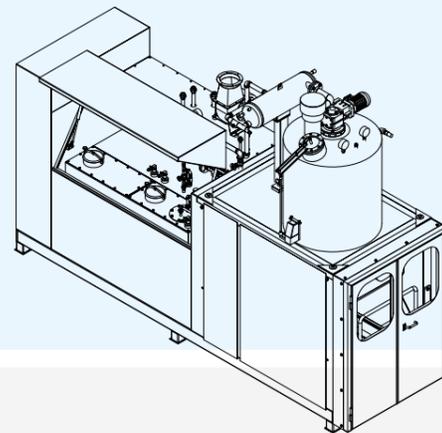
ROTOmaX-e

Model ROTomaX-C

- ▶ High-efficiency distillation unit (15 - 30 kW, 95% recovery rate)
- ▶ Powerful vacuum pump
- ▶ Two 1000-liter-containers for clean and used solvent
- ▶ Integrated drip pan
- ▶ All components and the entire unit are ATEX-certified
- ▶ The unit can be installed in an area that is not protected against explosions



ROTomaX-C



Model ROTomaX-W

ROTomaX-W

Avoiding waste water in cleaning processes

The ROTomaX-W distillation unit vaporizes soiled aqueous/alkaline washing and rinsing agents. The condensed clean distillate is admitted back into the rinsing water / washing agent circuit of the cleaning process. There is no waste water. The residue - greatly reduced and concentrated compared to the quantity of used rinsing water / washing agent - is disposed of as hazardous waste.

Process description

Approximately half of the soiled agent is vaporized in the pre-evaporator under normal pressure. The resulting steam (100°C) contains the energy added in the pre-evaporator and is piped into the heating floor of the distillation unit.

The soiled agent that has been slightly concentrated in the pre-evaporator is now sucked into the distillation boiler, in which

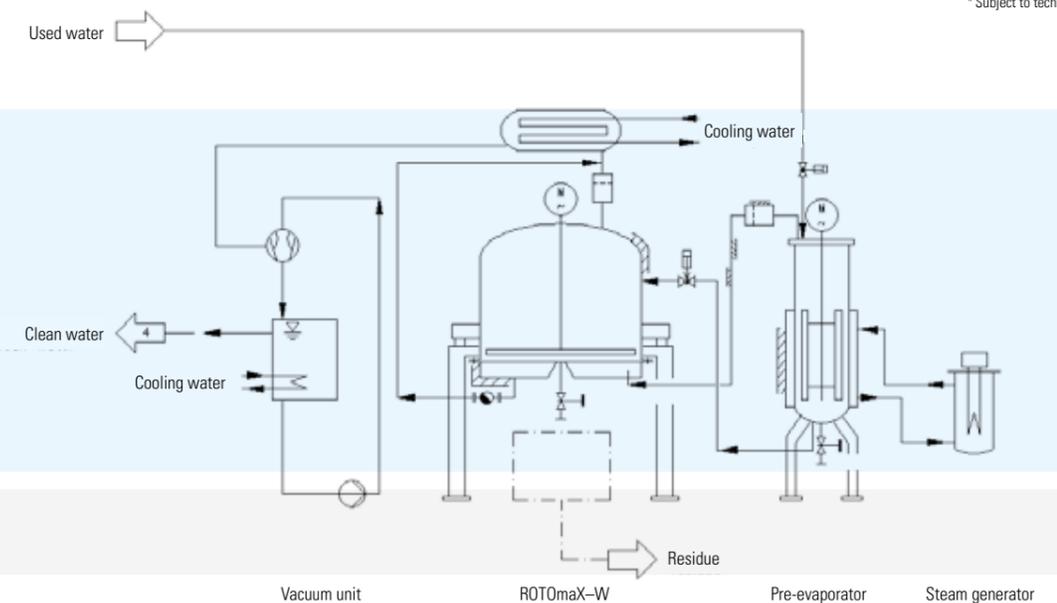
a vacuum has been generated. Due to the vacuum, the boiling temperature in the distillation boiler is reduced to < 60°C. The temperature difference of > 40°C between the boiler contents and the steam from the pre-evaporator makes the steam in the heating floor condense and transmit its energy to the contents of the distillation boiler. There, the washing agent is vaporized and concentrated to less than 5% of its original volume.

The pre-evaporator distillate that condensed in the heating floor is sucked into the condenser of the distillation unit and combines with the condensing vapors from the distillation boiler. The distillate cools slightly in the condenser, runs to the vacuum unit and from there into a separate clean water container.

The loss of liquid in the pre-evaporator (half of which is caused by evaporation, the other half by liquid being sucked into the distillation boiler) is compensated for automatically by continuous refilling.

Distillation unit ROTomaX-W	20	30	50	75	110
Distillation output l/h *	15 - 25	30 - 40	45 - 65	70 - 95	100 - 140
* Distillation output with pre-evaporator + 80%					

* Subject to technical changes



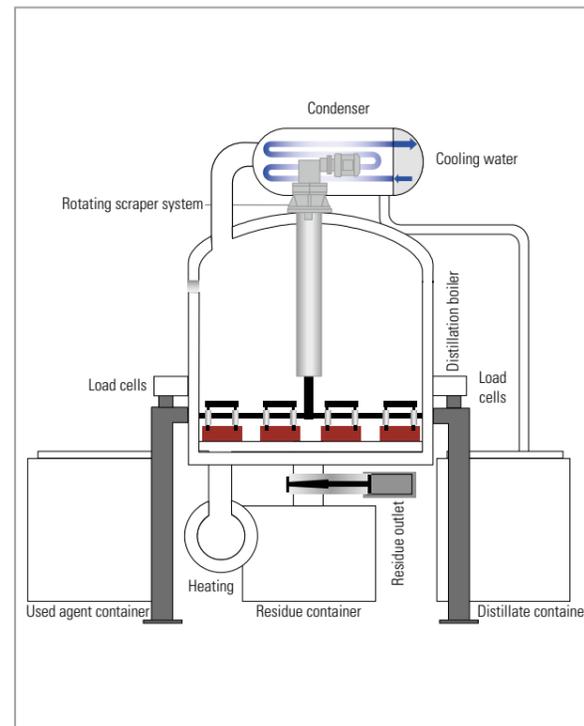
Model ROTomaX + packed column

Distillation systems for combined solid-liquid and liquid-liquid separation

+ packed column	Combination
	<p>Liquid-liquid separation</p> <ul style="list-style-type: none"> Fully automated process under vacuum Contains structured high-performance packing

Distillation unit	Combination
	<p>Solid-liquid separation</p> <ul style="list-style-type: none"> Fully automated process Vacuum unit lowers the operating temperature Scraper prevents deposit build-up and improves heat transfer; automatic residue discharge Load cells monitor the filling quantity

Application example
<p>Distillation of NMP containing binding agents and water:</p> <ul style="list-style-type: none"> Clean NMP with < 200 ppm residual water content



Customized service
<p>Project planning to adapt the equipment to your requirements:</p> <ul style="list-style-type: none"> Distillation tests in our laboratory Possibility of enclosing the equipment for installation in an area not protected against explosions

Settings Roto-maX A2210 NMP-Distillation			
Selection operation mode	Semi-automatic without emptying	Actual operation mode	Semi-automatic without emptying
Distillation quantity	0 kg	Filling quantity kettle	0 kg
		Refill quantity	0.0 kg
Heating temperature	0 °C	Temperature differential	0 K
Tracking heating temperature	OFF	Ramp time heating up	0 min
Stop performance	0 kg/h	Stop weight in % of distillation quantity	0.0 %
Heat-up time performance control	0 min	Delay stop distillation	0 s
Temperature difference to stop TISA2240 - TIC2220	0 K	Max. runtime	0 min
Inertization	0 s	Dealy start heating	0 s
Delay detection of emptiness	0 s	Time lag vacuum	0 s

