

POWERVAP[®] - EX

GENSER[®]  **Scientific Instruments GERMANY**



NOW AVAILABLE

**High performance PTFE-sealings
for all glass connectors**

**Loss of pressure of the complete system
< 2 hPa/h (system empty)**

**Also available for very aggressive media
(e.g. TFA, etc.)**

Fully automated rotary evaporators

POWERVAP[®] is a fully automated rotary evaporator with excellent performance and function. (EX-version ATEX)

The following outstanding features of the **POWERVAP[®] will save you time and money:**

- ◆ Filling and draining of the rotating flask automatically.
- ◆ Draining of the distillate receiver automatically (patented).
- ◆ Produces a pre-determined product concentration.
- ◆ Close control of the distillation process. Temperature, vacuum and other process variables are closely controlled allowing processing of foaming product.
- ◆ Computer controlled reflux
- ◆ The pendulum system makes the rotating flask floats in the water bath, to achieve maximum performance and reliability.
- ◆ The floating rotating flask reduces mechanical stresses, which results in a safe and powerful distillation process.
- ◆ Patented hydraulic damping system for the rotating flask and the motor unit, to absorb mechanical pulses if e. g. powders are to be dried.
- ◆ Special surface treated glass flanges for best vacuum stability.
- ◆ High performance sealing system
 - PTFE-GLASS process contact
 - Final vacuum 0.1 hPa (system empty)
 - Leakage rate < 5 hPa/h (system empty, vacuum valve closed)
 - Life expectancy approx. 20,000 (twenty thousand) running hours
 - Warranted for 3 years
- ◆ Excellent solvent recovery thanks to the leak proof sealing system.
- ◆ Vapor temperature control, to automatically switch off the heating bath.



POWERVAP[®] offers 5 times the performance of a standard rotary evaporator employing the same rotating flask size.

POWERVAP[®] - applications:

- ✓ Excellent for solvent recovery
- ✓ Especially designed for high boiling solvents
- ✓ Concentration of extracts
- ✓ Distillation of large quantities of solvents
- ✓ Concentration of fractions from the preparative HPLC

You want more?
Explore the **POWERVAP**[®] interface **PVGui**

POWERVAP[®]-20 (diagonal condenser & **PVGui**-interface



The **PVGui**-interface helps you to configure and control the **POWERVAP**[®] easily.

Do the settings and start the evaporator with the touchscreen (option) or the provided mouse.

At each step of the process you can see clearly arranged the actual value for temperature and pressure as well as the status of each sensor and valve.

The focus, while designing the **PVGui** was to create a nearly bullet proof and easy to handle user interface. This is why it is based on a LINUX operating system.

POWERVAP® guarantees an unattended, safe
and continuous (24/7) operation

PVGui-(original screenshot)



PVGui V6.5

Set- and actual values

Variables	Actual values	Set values
Dosed steps (d)	0	0
Cycles (b)	1	1
Max. vapor temperature (t)	21 °C	60 °C
Vacuum (v)	973 hPa	200 hPa
Minimal vacuum (Auto) (x)		199 hPa
Product quantity (p)	0 %	100 %
End quantity (e)		0 %
Heating bath temperature (T)	18 °C	0 °C
Rotating flask speed (r)	24 rpm	25 rpm

Important buttons

Start Powervap, Activate reflux, Pump out distillate, End procedure, Product dosing 5 sec., Awaiting 1 sec., Manual VC activated, Activate automatic VC.

Graphic

Console

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2011-11-30, 12:53:37 1. Welcome
2011-11-30, 12:53:40 2. Emptying of product tube
2011-11-30, 12:53:43 3. Filling of product tube
2011-11-30, 12:53:44 4. Emptying of rotating flask
2011-11-30, 12:54:36 5. Removing of distillate
2011-11-30, 12:55:07 Distillate pumped out: or no Distillate removal.
2011-11-30, 12:55:09 6. Pre-heating of bath
2011-11-30, 12:56:01 6. Pre-heating of bath
2011-11-30, 12:56:12 Background test of the vacuum sensor S1.
2011-11-30, 12:56:17 Background test of the inclinometer S5.
2011-11-30, 12:56:26 Powervap successfully configured.
2011-11-30, 12:56:26 7. Successfully completed.
2011-11-30, 12:56:28 Main operating window is open now.
  
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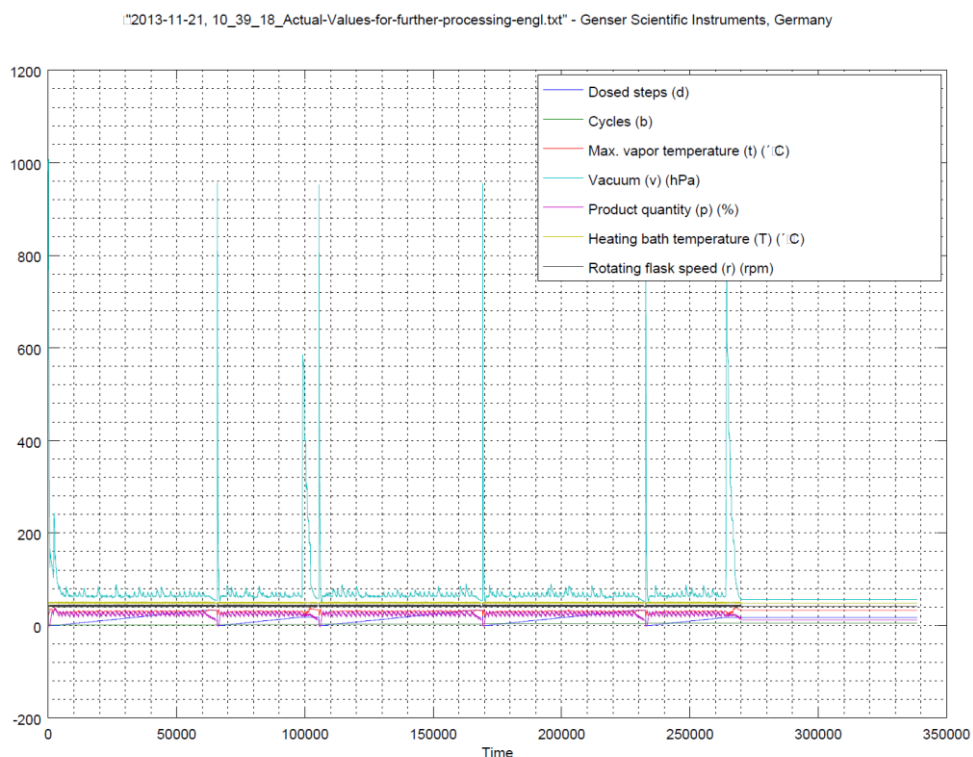
Automatic end procedure after:

0 Days 0 Hours 0 Minutes

Running time: 000 Days, 00 Hours, 08 Minutes, 43 Seconds.

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Plot of **POWERVAP[®]** variables (option)



A bunch of **POWERVAP[®]-50** (vertical condenser, standard text terminal)



Datasheet of **POWERVAP[®]-6/10/20/50/100**

System		
1	High performance, low delta-p condenser	POWERVAP[®]-6: 0.3 m ² POWERVAP[®]-10: 0.6 m ² POWERVAP[®]-20: 0.6 m ² POWERVAP[®]-50/100: 1.2 m ²
2	Cooling water consumption	100 l/h up to 1500 l/h
3	Rotating flask capacity	POWERVAP[®]-6: 6 l POWERVAP[®]-10: 10 l POWERVAP[®]-20: 20 l POWERVAP[®]-50: 50 l POWERVAP[®]-100: 100 l
4	Rotating flask neck (centric version)	POWERVAP[®]-6: Cone joint TS55 POWERVAP[®]-10/20/50: Plane joint 100mm dia. POWERVAP[®]-100: Plane joint 150mm dia.
5	Flask connection at drive unit	Combined two-way connection (mounting and press off)
6	Distillate emptying system (patented)	Yes
7	Concentrate emptying system	Yes
8	Product filter	Yes
9	Reflux system	Yes
10	Special surface treated glass flanges	Yes
11	MOC of all glass parts	Borosilicate glass type 3.3 (ISO 3585)
12	Plastic safety coating (glass)	Option
13	MOC of bellows and piping	PTFE
14	Patented pendulum system	Yes (www.rotationsverdampfer.com/images/pv250move003.gif)
15	Patented hydraulic damping system for the rotating flask and the motor unit	Yes

16	Potential equalization	Yes
17	Anti-static wheels (lockable)	Yes
18	Dimensions (diagonal condenser) LxDxH in cm (trolley included)	POWERVAP[®]-6: 115x75x195 POWERVAP[®]-10/20: 135x85x215 POWERVAP[®]-50: 150x90x225 POWERVAP[®]-100: 175x100x230

Heating bath

1	Operating voltage (bath)	400V/3-phase (other voltages upon request)
2	Heating element	POWERVAP[®]-6: 3 kW POWERVAP[®]-10/20: 6 kW POWERVAP[®]-50/100: 12 kW
3	MOC of heating bath vessel	1.4571 (316 Ti) stainless steel
4	Water overflow	Yes
5	Heating bath	Insulated
6	Heating bath temp range	20 - 100°C
7	Overtemperature limiter (heating element)	Yes
8	Adjustable overtemperature thermostat	Yes
9	Electronic temperature thermostat	Yes
10	Automated water level control	Yes
11	Protection shield / cover	Yes
12	Marking	Heater: Ex II 2G EEx de IIC T4 Controller: Ex II 2G Ex demb ia IIC T4

Motor unit

1	Rotation speed	POWERVAP[®]-6/10/20: approx. 8 – 90 rpm POWERVAP[®]-50/100: approx. 8 – 60 rpm
2	Marking	EEx II 2G c IIC TX

Sealing system

1	Final vacuum (system empty)	0.1 hPa
2	Leakage rate (system empty, valves closed)	< 5 hPa/h
3	Life expectancy (sealing system)	Approx. 20,000 (twenty thousand) running hours
4	MOC of the sealing system	PTFE/glass compound
5	Warranty (sealing system)	3 years

Warranty

1	Warranty (system)	3 years (without glass)
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Performance

1	Distillation rate of water (heating bath temperature 60°C) approx.:	POWERVAP[®]-6: 2 l/h POWERVAP[®]-10: 3 l/h POWERVAP[®]-20: 4.5 l/h POWERVAP[®]-50: 6.5 l/h POWERVAP[®]-100: 8.5 l/h
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Recommended vacuum pump

1	Suction capacity	1.0-3.5 m³/h
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General remarks

1	Vacuum (setting/display)	Yes (accuracy $\pm 0.3\%$ f. s.)
2	Vapor temperature (setting/display)	Yes (accuracy $\pm 1\text{K}$)
3	Bath temperature (setting/display)	Yes (accuracy $\pm 1\text{K}$)
4	Dosed steps (setting/display)	Yes
5	Cycles (setting/display)	Yes
6	Product quantity (setting/display)	Yes
7	End quantity (setting/display)	Yes
8	Process time (display)	Yes
9	Drive speed control (setting/display)	Yes
10	Automatic speed control system (patented)	Option
11	Vacuum valve	Yes (long life pneumatic valve)
12	Aerating valve	Yes (long life pneumatic valve)
13	Compressed air (nitrogen) valve	Yes (long life pneumatic valve)
14	Product valve	Yes (long life pneumatic valve)
15	Distillate valve	Yes (long life pneumatic valve)
16	Concentrate valve	Yes (long life pneumatic valve)
17	Distillate level sensor (2x)	Yes
18	Product sensor	Yes
19	Inclination measuring device	Yes
20	Vacuum sensor	Yes
21	Automatic vacuum control mode	Yes
22	Pulse-aerating mode	Yes
23	Detection of overpressure	Yes

24	Process control (safety watchdog)	Yes
25	Aerating in case of emergency	Yes
26	Vapor temperature alarm (acoustic)	Yes
27	Heating bath level sensor	Yes
28	Water inlet valve (heating bath)	Yes
29	Heating interrupt by Vapour temperature alarm	Yes
30	Pulse dosing system (patented)	Option
31	Computer controlled sealing system STACONSEAL (patented)	Option
32	Control unit mobile	Yes
33	Graphic user interface PVGui	Yes
34	Non-volatile memory	Yes
35	External analog (for supervision or safety devices) available	Option
36	USB interface	Yes
37	Operating Voltage (control unit)	230V 50/60 Hz (other voltages upon request)
38	Dimensions of POWERVAP[®] computer LxDxH in cm (trolley included)	50x65x145
39	Marking	II 2 G EEx p T4