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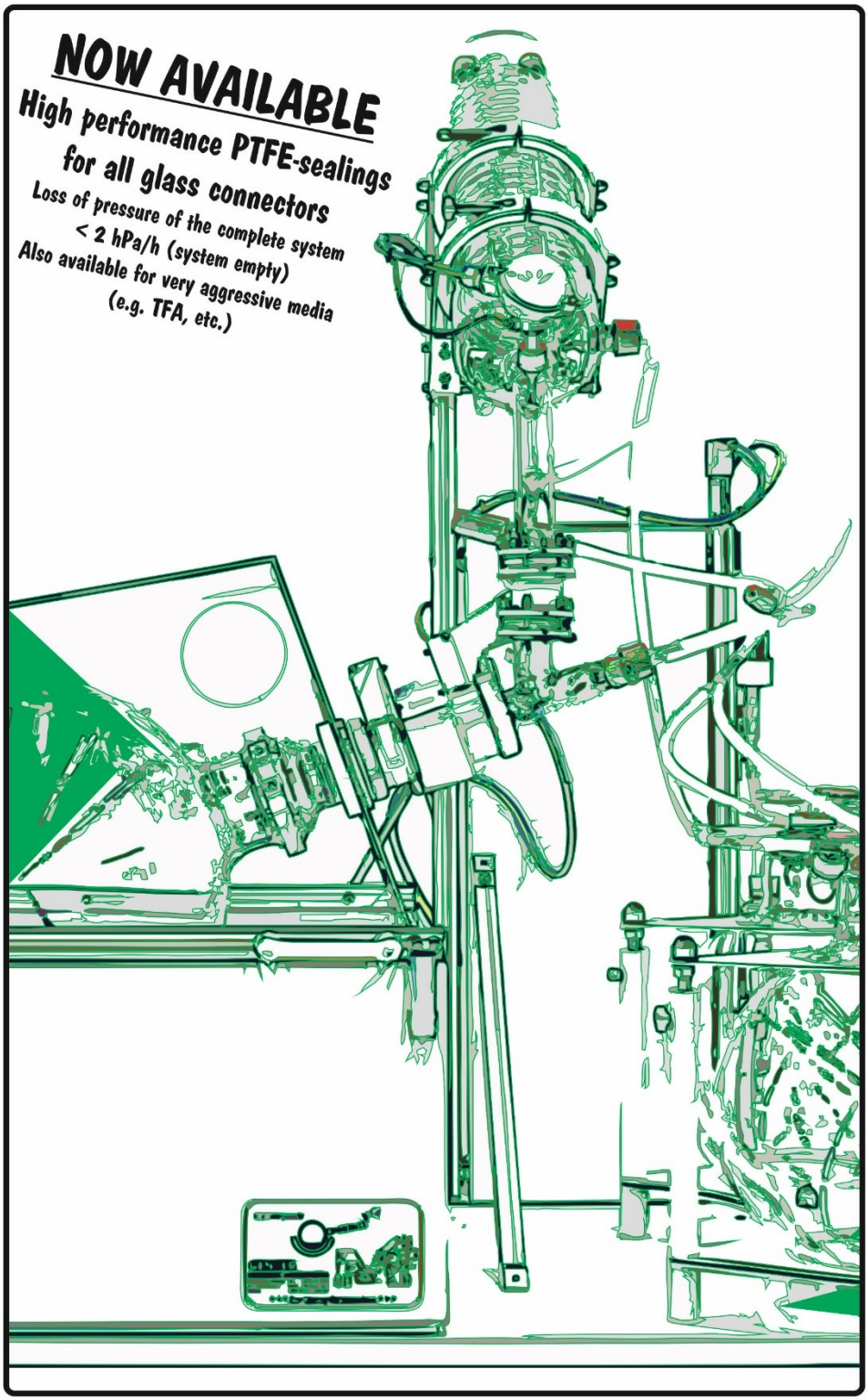
Scientific Instruments GERMANY

PILOTVAP®



Ex-proof rotary evaporators

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PILOTVAP-EX is a patented pendulum system rotary evaporator with excellent performance and function

- 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
- Draining of the distillate vessel without aerating the complete evaporator (distillation continues)
- Special surface treated glass flanges for best vacuum stability
- High performance sealing system
  - PTFE-GLASS process contact
  - Life expectancy approx. 20.000 (twenty thousand) running hours
  - Warranted for 3 years
  - Final vacuum 0.1 hPa (system empty)
  - Leakage rate < 5 hPa/h (system empty, vacuum valve closed)
    Leakage rate < 2 hPa/h (with high performance PTFE-sealings / option)
- Excellent solvent recovery thanks to the leak proof sealing system
- Vapor temperature control, to automatically switch off the water bath
- Automatic vacuum control system
- Implosion protection hood for the rotating flask

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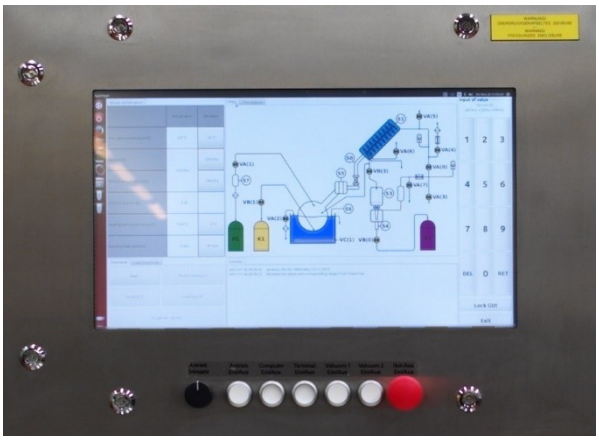
The pendulum system makes the rotating flask float in the heating bath, to achieve maximum performance and reliability

PILOTVAP-EX applications

- ✓ Excellent for solvent recovery
- ✓ Especially designed for high boiling solvents
- ✓ Concentration of extracts
- ✓ Drying of powders
- ✓ Concentration of fractions from the preparative HPLC

PILOTVAP-EX control unit SENTINEL

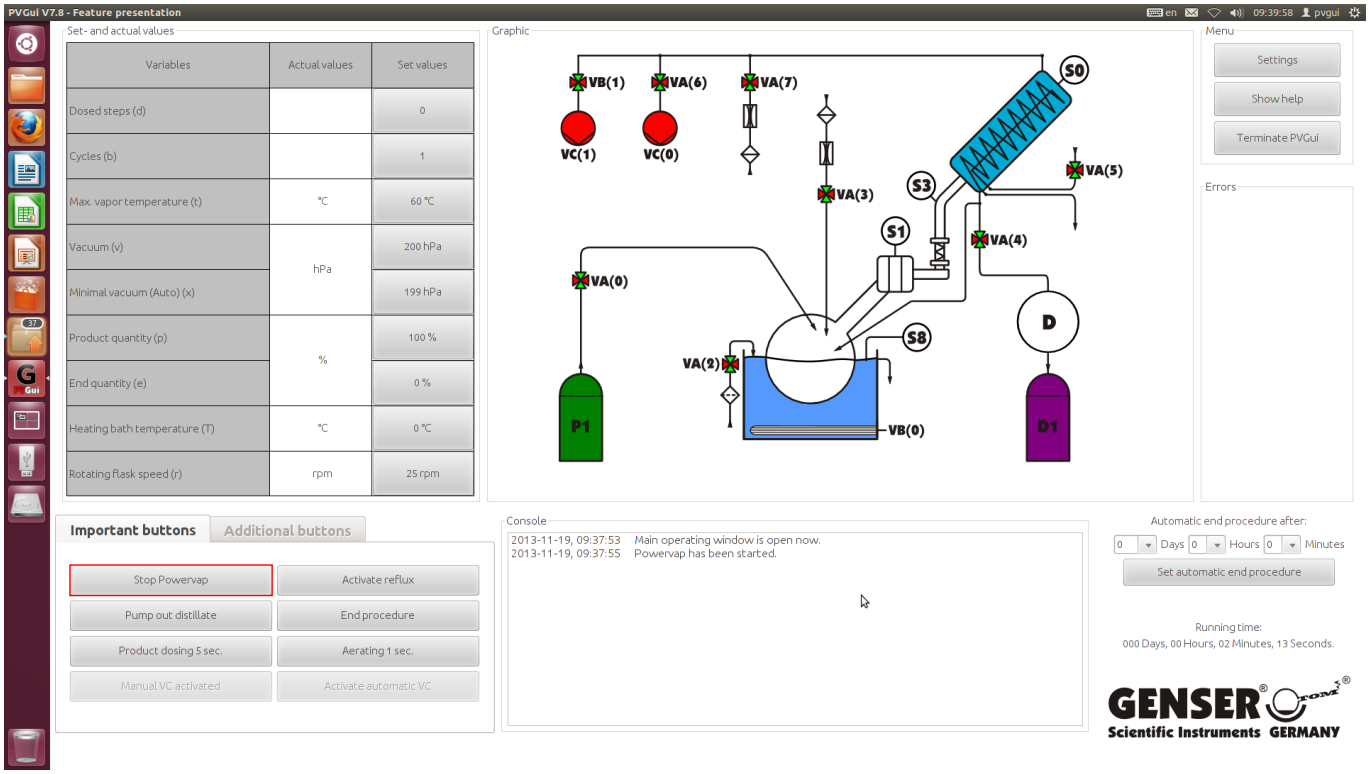
- ✓ Speed controller
- ✓ Vapor temperature controller
- ✓ Heating bath temperature controller
- ✓ Vacuum controller with automatic vacuum control system
- ✓ Pulse aerating system
- ✓ RS232-port for data transfer
- ✓ Watchdog



Options

- ✓ Automatic speed control (patented)
- ✓ Automatic foam control (patented)
- ✓ STACONSEAL – computer controlled main seal monitoring system (patented)
- ✓ Automated reflux

SENTINEL



Sentinel

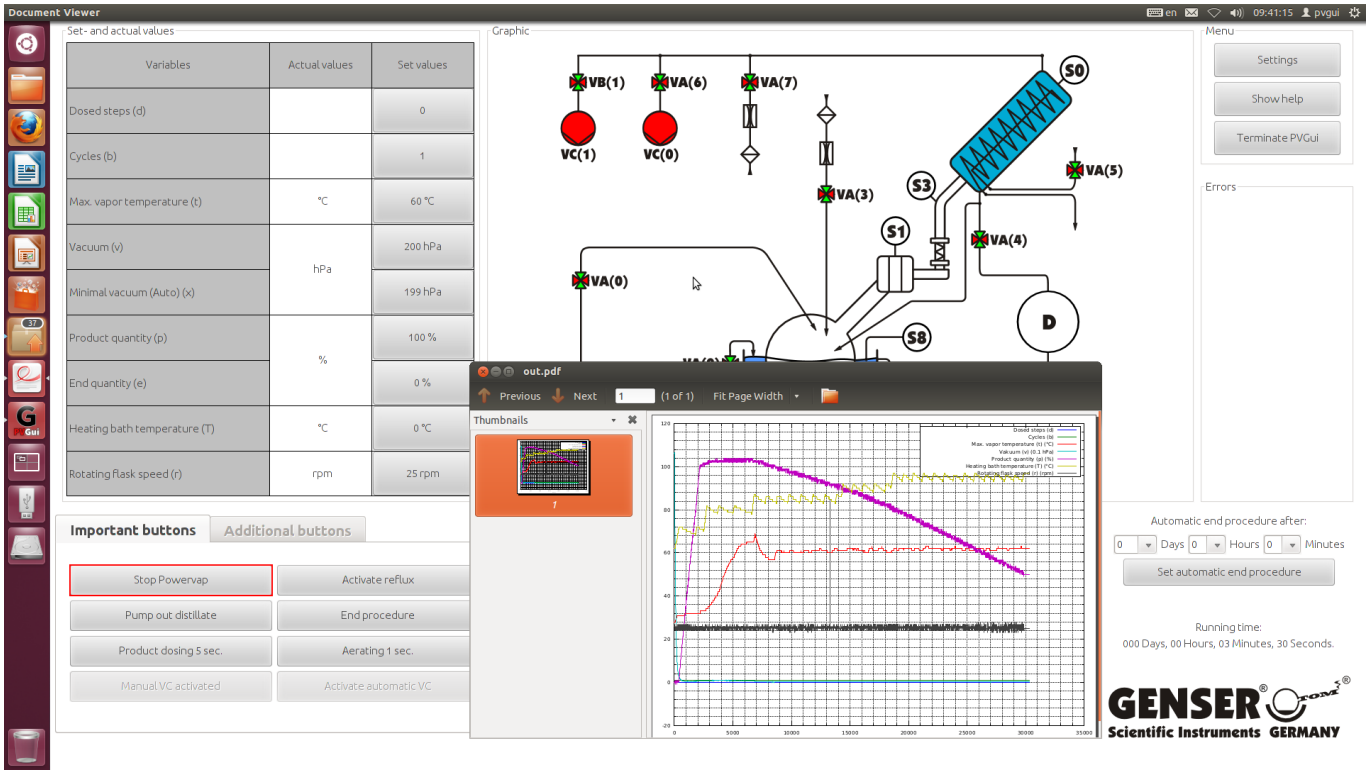
... is the name of our new easy to handle user interface for **PILOTVAP®** rotary evaporators. It supports multiple languages and offers a lot of new features as listed below.

FastControl

SmartGuard offers a brand new touchscreen or mouse based interface. It was developed to make the input system handling easier - moreover it is faster and safer. The chance to enter a wrong value by mistake is less probable compared to other rotary evaporators.

SafeLog

SmartGuard saves actual and set values, messages, errors and commands in logfiles. Furthermore you are able to plot different values like vacuum, heating bath temperature and others in diagrams. This simplifies troubleshooting, but also improves your process. The files can be transmitted via highspeed USB 3.0 port.



SmartProg – Don't reinvent the wheel every day!

PILOTVAP® combined with the new **SmartGuard** interface, creates the first user programmable rotary evaporator in the world! You simply can transmit self-written or prefactored control sequences to the rotary evaporator. This leads to a totally new and efficient way of working. While other rotary evaporators need at least one specialist, who controls the whole process round the clock, **SmartGuard** lets you automate processes easily by using short program scripts.

Predefined programs:

- Powder drying
- Drying
- Fractionating
- Removal of solvent traces

Linux based

… systems, like the **SmartGuard** controller, are resistant against computer viruses. Furthermore you benefit from the high stability of the operating system. For example, after a power loss exception that can lead to boot inability of other operating systems, **Linux** is still bootable (in general).

SmartGuard hardware overview

- Highspeed solid state drive (SSD) for fast system boots and program starts.
- Highspeed USB 3.0 ports for fast data transmissions.
- HD capable graphic card and screen for maximum graphic enjoyment.
- Please note: hardware components listed above may be replaced,
  if faster/better ones are available.

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PILOTVAP-EX – robust, flexible, easy to maintain

PILOTVAP-50-EX with SENTINEL

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Datasheet of **PILOTVAP-6/10/20/50/100**

Body

1	High performance, low delta-p condenser	**PILOTVAP-6**: 0.3 m² **PILOTVAP-10**: 0.6 m² **PILOTVAP-20**: 0.6 m² **PILOTVAP-50**: 1.2 m² (option: 2.5 m²) **PILOTVAP-100**: 1.2 m² (option: 2.5 m²)
2	Cooling water consumption	100 l/h up to 1500 l/h
3	Distillate flask capacity	**PILOTVAP-6**: 5 l **PILOTVAP-10**: 10 l **PILOTVAP-20**: 10 l (option 2x 10 l) **PILOTVAP-50**: 20 l (option 2x 20 l) **PILOTVAP-100**: 2x 20 l
4	MOC of all glass parts	Borosilicate glass type 3.3 (ISO 3585)
5	MOC of bellows and piping	PTFE
6	Aerating valve (distillate flask)	Yes
7	Vacuum valve (distillate flask)	Yes
8	Outlet valve (distillate flask)	Yes
9	Rotating flask capacity	**PILOTVAP-6**: 6 l **PILOTVAP-10**: 10 l **PILOTVAP-20**: 20 l **PILOTVAP-50**: 50 l **PILOTVAP-100**: 100 l
10	Flask connection at drive unit	Combined two-way connection (mounting and press off)
11	Rotating flask neck (centric version)	**PILOTVAP-6**: Cone joint TS55 **PILOTVAP-10/20/50**: Plane joint 100mm dia. **PILOTVAP-100**: Plane joint 150mm dia.
12	Special surface treated glass flanges	Yes
13	Reflux system	Yes
14	Patented pendulum system	Yes (www.rotationsverdampfer.com/images/ pv250move003.gif)
15	Patented hydraulic damping system	Yes

16	Plastic safety coating (glass)	Option
17	Potential equalization	Yes
19	Anti-static wheels (lockable)	Yes
20	Dimensions* LxDxH in cm	**PILOTVAP-6**: 95x70x120 (trolley included: 95x70x195) **PILOTVAP-10/20**: 135x80x155 (trolley included: 135x80x215) **PILOTVAP-50**: 150x90x165 (trolley included: 150x90x225) **PILOTVAP-100**: 150x100x170 (trolley included: 150x100x230)

* Dimensions are subject to change without notice, please ask for actual dimensions

Heating bath

1	Operating voltage (bath)	400V/3-phase (other voltages upon request)
2	Heating element	**PILOTVAP-6**: 3 kW **PILOTVAP-10/20**: 6 kW **PILOTVAP-50/100**: 10 kW
3	MOC of heating bath	1.4571 (316 Ti) stainless steel
4	Automatic refilling of heating bath	Option
5	Water overflow	Yes
6	Heating bath	Insulated
7	Heating bath temperature range	Water bath 20-100°C / Oil bath 20-180°C
8	Overtemperature limiter (heating element)	Yes
9	Adjustable overtemperature thermostat	Yes
10	Electronic temperature thermostat	Yes
11	Protection shield / cover	Yes

Motor unit

1	Rotation speed	**PILOTVAP-6/10/20**: approx. 8 – 90 rpm **PILOTVAP-50/100**: approx. 8 – 60 rpm
2	Speed controlled air driven motor	Yes / Low noise: approx. 64 dB(A)

3	Marking	EEx II 2G IIC T X

Sealing system

1	Life expectancy (sealing system)	Approx. 20.000 (twenty thousand) running hours
2	MOC of the sealing system	PTFE/glass compound
3	Warranty (sealing system)	3 years

Warranty

1	Warranty (system)	3 years (without glass)

Performance

1	Max. Vacuum performance (system empty))	0.1 hPa
2	Loss of pressure (system empty)	< 5 hPa/h < 2 hPa/h with high performance PTFE-sealings
3	Distillation rate of water (heating bath temperature 60°C) approx.:	**PILOTVAP-6**: 2 l/h **PILOTVAP-10**: 3 l/h **PILOTVAP-20**: 4.5 l/h **PILOTVAP-50**: 6.5 l/h **PILOTVAP-100**: 8.5 l/h

Recommended vacuum pump

1	Suction capacity	1.0-3.5 m³/h

Control unit **TOM-GUARD-EX**

1	Vacuum (setting/display)	Yes (accuracy ± 0.3 % f. s.)
2	Vapor temperature (setting/display)	Yes (accuracy ± 1K)
3	Bath temperature (setting/display)	Yes (accuracy ± 1K)
4	Vacuum valve	Yes (long life pneumatic valve)
5	Aerating valve	Yes (long life pneumatic valve)

6	Vacuum sensor (direct measurement)	Yes
7	Automatic vacuum control mode	Yes
8	Pulse-aerating mode	Yes
9	Aerating in case of an emergency	Yes (power failure, overpressure, reset, watchdog)
10	Invert mode	Yes (to easily find a new set value for the vacuum)
11	RS-232 interface	Yes
12	Non-volatile memory	Yes
13	Detection of overpressure (alarm)	Yes
14	Process control (safety watchdog)	Yes
15	Vapor temperature alarm (acoustic)	Yes
16	Heating interrupt by vapor temperature control	Yes
17	External analog signals intrinsically safe (for supervision or safety devices)	Yes
18	External supervisory devices	Cooling water (option), compressed air (option) safety switches (option), etc.
19	Control unit mobile	Yes
20	Operating voltage (control unit)	230V 50/60 Hz (other voltages upon request)
21	Dimensions of GUARD LxDxH in cm (trolley included)	42x42x180
22	Marking	II 2 G EEx p T4