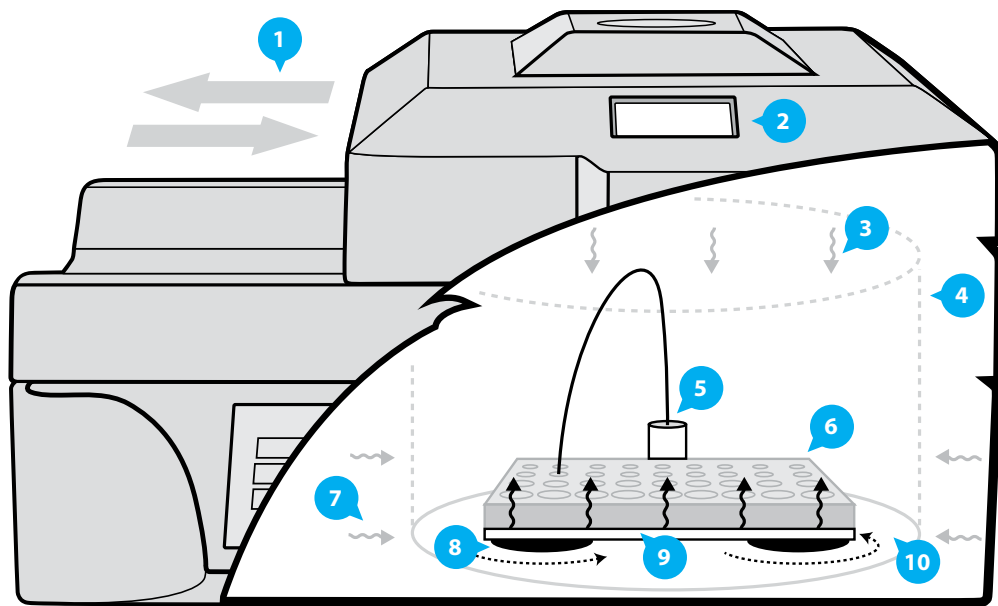




HETTICH INSTRUMENTS

The Hettich Vortex Vacuum Concentrator

Hettich



A look inside:

- 1 Auto open & close lid
- 2 Sample window
- 3 Infrared heating from above
- 4 316 stainless steel chamber
- 5 Temperature Probe
- 6 Exchangeable sample racks
- 7 Side wall heating
- 8 Magnetic feet
- 9 Heated base plate (optional)
- 10 Vortex motion

The Hettich Vortex Vacuum Concentrator

A non-centrifugal concentrator

FAST. FLEXIBLE. EFFICIENT.

Relieve the bottleneck in your workflow and minimize your operating time while reducing your overall cost of ownership.

The **Hettich Vortex Vacuum Concentrator (HVC)** is designed to remove solvents from samples while under vacuum. Unlike traditional centrifugal evaporation methods, the HVC uses a **vortex motion** with **infrared heating** and an **intelligent vacuum pump** to remove solvent from samples.

A world leader in centrifugation with **over 100 years** of engineering, design and manufacturing **experience** in the clinical & research laboratory and the Life Sciences, we immediately recognized the limitations and inefficiencies with *centrifugal* concentrators.

The HVC's **vortex** is proven to be **more efficient** than traditional centrifugal evaporation by offering:

- 3-10 times faster removal of solvent
- Even heating
- No centrifuge
- No rotor, buckets, adapters or inserts
- No need to balance
- No moving parts
- No guessing at evaporation completion
- No sample bumping
- Mix multiple sample sizes per run

VORTEXING

Unlike centrifugal evaporators the HVC uses a

magnetically coupled mixing base plate. A sample rack is attached to this base plate, which moves in an orbital motion. This motion creates a vortex of the sample solution in its container, creating a **larger surface area** for solvent evaporation (see Figure A).

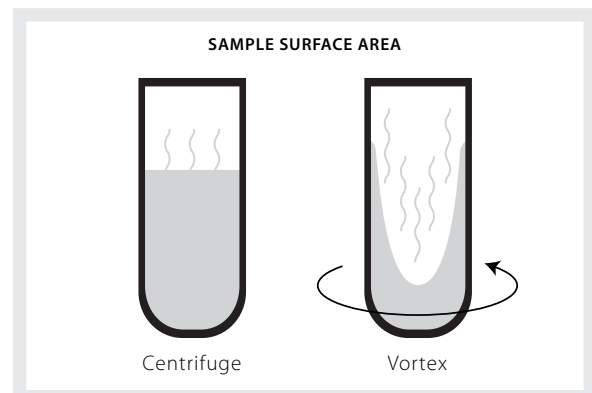


Figure A - Vortex Evaporation

The sample base plate has four magnetic feet that sit on a sealed glass base thus keeping the chamber and its contents completely separate from the magnetic drive mechanism and maintaining the integrity of the vacuum.

By controlling the vortex, heating and vacuum; **complex solvent mixtures** can easily be concentrated to dryness.

Users who do not wish to concentrate their samples to dryness can monitor the sample through the “**sample window**” and stop the run when their sample has reached an appropriate volume.





The picture above demonstrates the Hettich Vacuum Concentrator with sliding lid (robot friendly) and the loading of the heated base plate with attached universal rack. The rack will then sit in the 316 stainless steel chamber attached via its magnetically coupled feet. After the rack is loaded the lid will close and the evaporation process will begin.

SAMPLE HEATING/COOLING

Three types of heating are available on the HVC:

- Ceramic infrared heaters built into the lid of the HVC
- Interior chamber wall heating to prevent condensation
- An optional base plate heater with a range of 20 to 40 °C.

The heating is activated by a temperature probe inside the evaporation chamber that is set by the user to the desired sample temperature. As evaporation occurs and the sample cools and the heating is activated to maintain the sample set temperature.

SAMPLE RACKS & BASE PLATE

A **variety of racks** are available for the HVC to accommodate both microplates, tubes and microtubes plus any combinations of the above. A number of custom accessories are available such as to purge inert gases onto a microplate (see Figure C).

Should you require a custom rack these can be manufactured for specialized applications.

AUTOMATION

The HVC was designed to be **robotic friendly** with its RS232 connectivity, programmability and ability for robotic arms to have **easy access** to the sample.



The lid of the HVC slides to the left completely exposing the sample chamber, this provides **easy interfacing** for robotics.

An option is also available that stops the vortex motion in the same position so that a robotic arm can access the sample reproducibly.

QUALITY CONSTRUCTION

Hettich Instruments is one of the top three centrifuge manufacturers in the world. Offering **over 100 years** of engineering, design and manufacturing **experience** serving the clinical & research laboratory and the Life Sciences.

Utilizing the most current technology, Hettich manufactures its products to meet the latest in industry quality standards. All Hettich products go through rigorous in-house testing. Product quality tests are supervised by the major governing bodies (i.e. TUV) to ensure the highest level of safety in manufacturing. The metal components that make up our products go through a variety of stress tests and are studied to determine risk and product life cycle.

From its inception the HVC was designed with **ease of use** and **serviceability** in mind. Some features include a 316 stainless steel chamber, magnetic drive feet that sit on a glass base plate, one inch quartz glass chamber cover and a 2 year warranty.

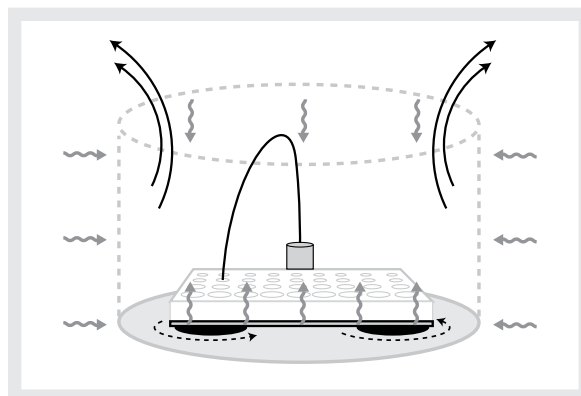


Figure B - Evaporation process

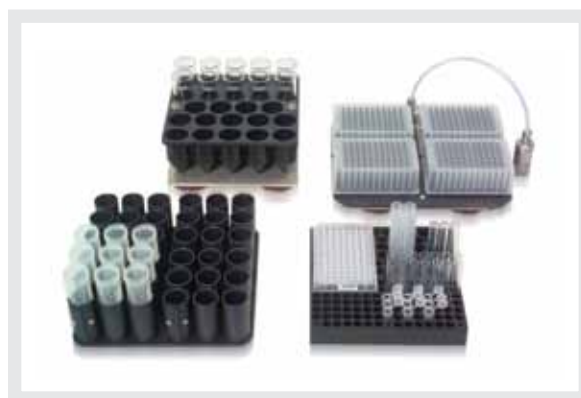


Figure C - Multiple sample racks

TYPICAL APPLICATION EXAMPLES

Solvent	HEXANE	WATER	ETHER DERIVATIVES	METHANOL	50% WATER / 50% ETHANOL
SAMPLE VOLUME (mL)	20	0.5	3.5-4	8	4
TUBE TYPE	50 mL conical	1.5 mL microliter	10 mL standard	20 mL scintillation vial	16 x 100 mm tube
NO. OF TUBES	36	256	96	69	144
TEMPERATURE (°C)	40	40	30	40	40
EVAPORATION TIME (minutes)	20	56	40	40	120



ENVIRONMENTALLY SAFE

The PoleStar Coldtrap

The **PoleStar cold trap** has been designed to meet the most demanding requirements of the evaporation process and to ensure the highest flexibility for the condensation or solvent recovery of solvents.

The **closed loop cooling system** cools the cooling coils down to -50°C . This ensures that all solvents condense on the coils protecting the vacuum pump. The cooling coils plus the chamber is PTFE coated for maximum chemical resistance.

The cold trap has a special **rapid defrost** mode, which allows the removal of a 5 mm layer of ice within a few seconds. This can be activated by a key on the front of the instrument or automatically (optional).

The PoleStar has a **capacity of 3.3 liters** (fluid) for solvent recovery. A stopcock located on the front of the instrument permits **easy draining** of the solvents. This cold trap is practically **maintenance-free**, only the fins at the back of the instrument have to be kept clean from dust deposit.

SPECIFICATIONS

Dimensions (WxDxH)	520 x 430 x 530 mm
Weight	51 kg
Power Source	230Vac 50/60 Hz or 115Vac 50/60 Hz
Power Consumption	660 VA (3.15A)
Capacity	3.3 Liter
Cooling Temperature	-50°C
Chamber	Aluminum FEP coated
Coil	Stainless steel 316 (V4A)
Option	FEP coated
Gas inlet / outlet	PTFE, connectors 316 (V4A) steel
Top cover, base plate	304 (V2A) stainless steel
Back panel	Aluminum





INTELLIGENT

Vacuum Pump

The intelligent vacuum pump used with the HVC is a **diaphragm pump** with **variable speed** and a minimum vacuum of 0.6 Mbar. The pump is **extremely quiet** compared to other systems on the market.

The pump measures vapor pressure and adjusts its speed to the parameters chosen by the HVC.

By linking programs in the HVC and utilizing the features of the vacuum pump complex solvent mixture can be evaporated to dryness.

The pump has three modes of operation, the two that are mainly used by the Hettich Vacuum Concentrator are the PREC mode which will pull a vacuum to a desired mbar at a specified speed and the AUTO mode which measures the vapor pressure and adjusts the speed automatically.

Options are available for the HVC to automatically switch between the diaphragm and a rotary vane or scroll pump.

SPECIFICATIONS

Max pumping speed	2.8 m ³ /h
Ultimate vacuum (absolute) without gas ballast	0.6 mbar
Ultimate vacuum (absolute) with gas ballast	2 mbar
Permissible ambient temperature storage	-10 to +60 °C
Permissible ambient temperature operation	-10 to +40 °C
Permissible relative atmospheric moisture during operation (no condensation)	30 to 85%
Power (electric)	575 W
No-load speed	30-2400 min ⁻¹
Max permissible range of supply voltage (±10%)	100-120V
Max nominal current draw	6.3
Device fuse	slow blow
Motor protection	thermal cutout
Degree of protection IEC 529	IP 20
Dimensions (LxWxH) mm	422 x 258 x 516
Weight	21 kg

The Hettich Vacuum Concentrator Features & Benefits

FEATURE	BENEFIT
Sample window with internal lighting	View the progress of solvent evaporation, ability to pause process at anytime.
Infrared heating	Replaces heat loss of a sample while under vacuum.
Sample chamber with internal heating	Prevents condensation on chamber walls.
Sample vortexing	Faster evaporation. Creates larger surface area for solvent removal. No compression of solvent gases.
Variable vacuum pump	Stops bumping by controlling evaporation process. Reduces sample concentration time.
Variety of sample racks	Easy to change or mix various container sizes in the same run. No imbalance issues.
Magnetically coupled sample plate	No mechanical coupling, easy to remove. Isolates drive mechanism from solvent vapors.
No moving parts	Low cost of ownership, longer life.
Programmable	Up to 99 user-defined programs.
Linking of programs	Removal of complex solvent mixtures such as Azeotropes.
Measurement of sample temperature	Used to regulate the infrared heating lamps and not overheat samples.
Highly polished 316 (V4A) stainless steel	High chemical resistance, easy cleaning, longer life
Purging with inert gas	For use with explosive gas mixtures or delicate samples
Automation/ Robot friendly	Lid slides sideways for easy access by robots. Software controlled via RS232 port with ports for Vacuum pump, PoleStar and Alarms.
PoleStar viewing window	Monitor cooling coil to view ice build up.
Access Key	Quality assurance. Stops users from changing programs.

Specifications

Dimensions (width x depth x height)	765 mm (lid closed) 930 mm (lid open) x 695 mm x 470 mm
Weight	80 kg
Power source	115Vac 50/60 Hz, 230Vac 50/60 Hz upon request
Power consumption	1800 VA
Ports	3 x RS232 (VP, CT, PC)
Vacuum chamber: material	316 Stainless steel (V4A)
Vacuum chamber: diameter height	360 mm 180 mm
Connector: vacuum pump	DN25
Connector: release/ inert gas inlet	6mm stainless steel Swagelok fitting
Vortex speed	200 – 1,200 rpm
Temperature control range:	20 to 80°C
Cover material:	V0 plastic UL-listed

