



miVac Modular Evaporator Range

The miVac Range

The ATS miVac range is designed to be modular and capable of removing water and organic solvents from a variety of sample formats including tubes, microplates and vials.

Centrifugal evaporators remove solvent under vacuum. As the pressure in the system reduces, the boiling point of a solvent also reduces. When the pressure is low enough, the solvent will boil, enabling removal of solvents at very low temperatures. Solvent vapor boiling off the samples is either trapped in a condenser or pumped away through the pump. To prevent the evaporating sample boiling over or ejecting material in an uncontrolled way, samples are spun in a centrifuge. The g-force generated is sufficient to keep each sample in its own tube.

The miVac range comprises two concentrators, three pumps and a novel refrigerated trap. The miVac Pressure Controller helps to further optimize concentration and provides the user with full control of the concentration process.

miVac systems are suitable for use with a wide range of solvents, from volatile organic solvents through to water and many medium boiling point solvents.

With a wide variety of easily interchangeable sample rotors, miVac evaporators are suited to many different tasks and applications. These include drying or concentration in microcentrifuge tubes, conical centrifuge or other plastic tubes, glass vials, and shallow or deep well microplates. Applications range from ADME / toxicology, polymer chemistry, DNA, RNA & peptides, oligosynthesis, forensics / drugs of abuse testing, to food science and agrochemical research.

With an electro-magnetic drive, for maintenance free operation, miVac concentrators are extremely quiet when in use. Very high displacement pumps and built-in special methods for working with alcohols, water and water mixtures, improve performance and optimize concentration times. Typical results with water show that miVac systems are up to 40% faster than comparable machines.

The compact size of the miVac concentrators saves valuable bench space. Their simple, robust design will ensure years of reliable service even when used intensively, such as in teaching or multi-user laboratories. Intuitive controls allow inexperienced users to get first-class results first time with most samples, while allowing more sophisticated programming for experienced workers.





miVac DNA

The ATS Scientific Products miVac DNA integrated system is a centrifugal evaporator capable of removing water and organic solvents from a variety of sample formats. It is designed specifically for working with nucleic acids (RNA and DNA) and is supplied complete with everything the scientist requires: built in high performance vacuum pump, concentration chamber and a fixed angle aluminium rotor with 48 positions for 1.5 or 2 ml micro-centrifuge tubes. The miVac DNA is suitable for simple organic solvents, e.g. methanol, ethanol, up to 100 °C boiling point, and water in low sample numbers and volumes. There is a range of possible rotors including an option for microtitre plates.

Duo and Quattro Concentrators

There are two options available to accommodate various sample throughput requirements.

The ATS Scientific Products miVac Duo Concentrator has been designed to accept a two-swing position microplate rotor or disc rotors for tubes.

The miVac Quattro is a bigger system with a larger capacity chamber, enabling it to use a four-swing position microplate rotor and much higher capacity disc rotors.

Both concentrators control the pump, heat and run time, and have specialized programs for water, alcohols and other solvents. The intuitive controls and a large display make miVac very easy to use. Setting up is simple, with just one 'set and select' control knob and a minimum of keys. All status and program information is displayed alphanumerically on the large LCD display, giving every user confidence in their run conditions and results.



Vacuum Pumps

There is a choice of three oil-free pumps to complement the miVac concentrators.

For most applications, the high displacement miVac Duo Pump gives excellent results with either the miVac Duo or Quattro Concentrator. This quiet and compact two-head diaphragm pump is housed in a smart case to match the other miVac components and is suitable for removing solvents that boil below 130 °C, including water, methanol, ethanol and their mixtures.

For more demanding applications, the miVac Quattro Pump is a diaphragm pump which can reach pressures of 3 mbar and is required for successful drying of medium boiling point solvents.

Exceptionally demanding uses and freeze-drying will require a scroll-type Super Vacuum Pump. This pump is capable of routinely removing higher-boiling solvents at pressures down to 0.15 mbar.

All pumps are controlled automatically by the miVac Concentrator. However, when using solvent mixtures, a wide range of solvents, or a high vacuum pump, (such as the Quattro or Super Pump) the miVac Pressure Controller is recommended.

Modular Systems

For a wider range of solvents and/or a larger range of sample formats, select an ATS Scientific Products miVac Duo or Quattro Concentrator with miVac SpeedTrap, pump and optional Pressure Controller. Pre-configured system packages, which include a connection kit (but no rotor), provide a simple solution.



SpeedTrap

The miVac SpeedTrap is a uniquely designed high power cold trap used to condense solvent vapors. When a cold trap condenses vapors back to liquid there is a corresponding massive volume reduction, helping to maintain a vacuum and speeding up the concentration process considerably.

The miVac SpeedTrap is very small in size and requires little bench space. The cold condenser coils are suspended in the vapor path; solvent vapors condense directly onto the coils and run off into the collection vessel below. This method is highly efficient, the user can quickly see the solvents in the trap, and emptying the trap is easy.



SpeedTrap has Three Settings:

1. Automatic Defrost

In automatic mode, the system periodically defrosts for a few minutes without interrupting the concentration process, preventing build up of ice on the condenser coils. At the end of the process, the system requires no further defrosting. This mode is ideal for solvents liable to freeze.

2. Continuous Chilling

Select this mode for most organic solvents to ensure the highest recovery of solvents. There is no need to defrost at the end of the process. Ideal for solvents that do not freeze above -50 °C.

3. Manual Defrost

When continuous chilling is used with solvents which freeze above -50 °C, for example when freeze-drying, ice will accumulate on the coils and they must be defrosted afterwards by switching the SpeedTrap into manual defrost mode.

Pressure Controller

Pressure control enables the user to set the optimum boiling temperature for the solvent which is being evaporated so that the cold trap can condense it most efficiently. Correct use of pressure control eliminates the requirement for a very low temperature cold trap when removing very volatile solvents. Used in conjunction with the miVac SpeedTrap, evaporation is faster and more solvent can be recovered, reducing volatile solvent emissions.

The miVac Pressure Controller can be added to any modular miVac system and allows the user full control over the running pressure in the system. A vacuum ramping mode enables concentration to be commenced gently and is used to help prevent bumping or spitting.

For users who are uncertain of the appropriate pressures to choose, an automatic mode can be used. The large, clear screen provides graphical display of current pressure and allows for easy programming.

A pressure controller is ideal for systems which are to be used for many different applications, e.g. concentration, solvent mixtures and freeze-drying.



Sample Rotors

The ATS miVac evaporators are the only ones in their class to be supplied with rotors made from solid aluminium. The JetRotors™ range provides very high performance concentration compared to rotors made from plastic, or of an open construction. Speed increases compared with polypropylene types range between 40% and 200%, depending on sample format, providing a significant advantage when working with stubborn solvents such as water. The precision solid aluminium rotors efficiently conduct the heat energy needed for concentration to the samples, whereas in an open or plastic rotor the samples are effectively insulated by the plastic and/or the vacuum in the chamber.



Rotors are available for all common tubes, vials, centrifuge tubes and microcentrifuge tubes.

For microtitre plates, two and four place swing rotors will accept multiple plates through the use of stackers. A miVac Duo can hold six shallow plates and the larger miVac Quattro up to twenty shallow-well microplates or eight deep-well plates.



Freeze-Drying

The miVac SpeedTrap in conjunction with a Super Vacuum Pump may be used to freeze-dry up to 250 ml of water or other suitable solvents. Samples may be placed in a rotor in the miVac concentrator and freeze-dried at full vacuum. The low vacuum level boils the samples at a temperature below their freezing point; once frozen the ice sublimates away, leaving a dry powder.

Alternatively, the miVac SpeedTrap and Super Pump may be used as a stand-alone freeze dryer. A range of accessories has been designed to allow the SpeedTrap to directly accept pre-frozen samples in either flasks or vials. Simply attach the freeze-drying accessory jar in place of the regular SpeedTrap collection vessel. Flasks can be attached to the valves, or vials may be placed directly in the accessory jar, using the holders provided.



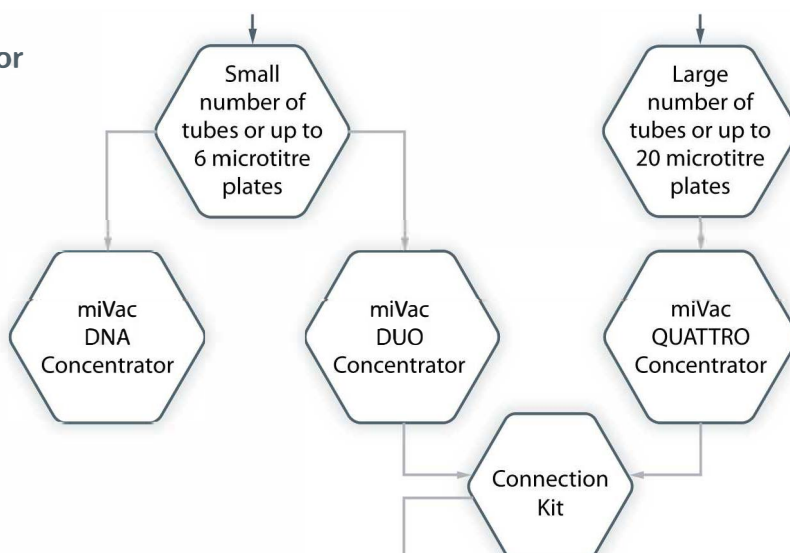
Please note: The miVac Duo Pump and Quattro Pump are not suitable for freeze-drying

Freeze-Drying Accessory Kit

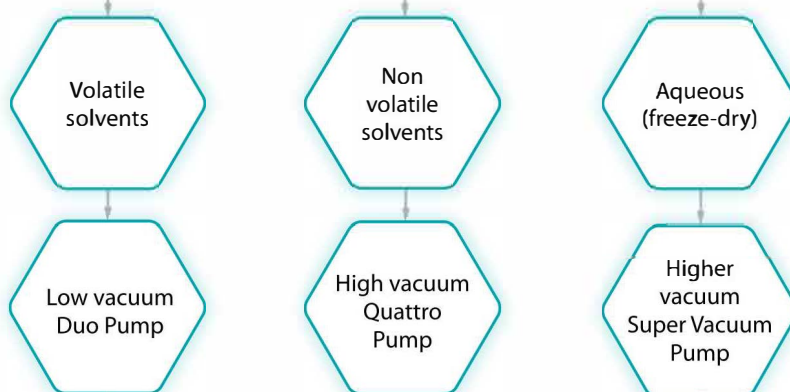
The freeze-drying accessory kit comprises: freeze-drying jar, three freeze-drying valves, three vial holders and handle, and a vacuum isolation valve. The vacuum valve can be used to seal off the SpeedTrap from the concentrator should you wish to configure your system as a freeze dryer and a concentrator. In such situations we recommend using the miVac Pressure Controller to allow selection of optimal vacuum levels for each process.



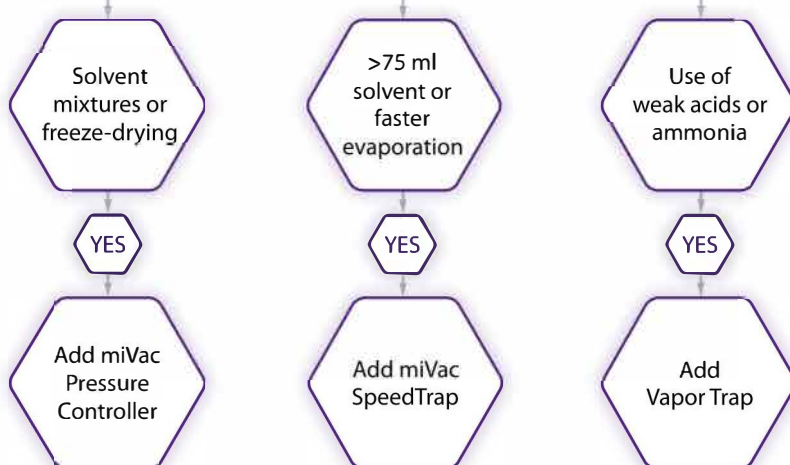
Choose Your Concentrator



Choose Your Pump



Choose Your Options



Choose Your Rotor & Accessories



Specifications

DNA Concentrator

Max. rotor speed	1465 rpm
Sample acceleration	Up to 250 g
Dimensions (WxDxH)	360 x 602 x 300 mm
Width with catch-pot	141 mm
Weight	41.5 kg

DUO Concentrator

Max. rotor speed	1465 rpm
Sample acceleration	Up to 250 g
Dimensions (WxDxH)	360 x 424 x 300 mm
Weight	21 kg

Quattro Concentrator

Max. rotor speed	1130 rpm
Sample acceleration	Up to 250 g
Dimensions (WxDxH)	480 x 594 x 300 mm
Weight	35 kg

Duo Pump

Ultimate vacuum ¹	< 10.0 mbar
Flow rate	38 litres/minute
Dimensions (WxDxH)	215 x 389 x 300 mm
Weight	19 kg

Quattro Pump

Ultimate vacuum ¹	< 3.0 mbar
Flow rate	33 litres/minute
Dimensions (WxDxH)	215 x 389 x 300 mm
Weight	18 kg

Super Vacuum Pump

Ultimate vacuum ¹	0.05 mbar
Dimensions (WxDxH)	282 x 432 x 302 mm
Weight	26.6 kg

SpeedTrap Condenser

Type	Single-stage vapor compression
Refrigerant gas	R449A
Refrigerant charge	100/120 V - 71 g 230 V - 64 g
CO ₂ e	> 0.1 tonnes
Max. pressure (PS)	30 bar
Nom. operating temperature	-35 °C
Ultimate low temperature ²	-50 °C
Max. defrost temperature	+60 °C
Rapid defrost	Yes
Rapid defrost over-ride	Yes (after Feb 2011)
Condenser jar	Plastic-coated borosilicate glass

Condenser jar capacity	1 litre
Dimensions (WxDxH)	212 x 563 x 450 mm
Weight	25.8 kg

Emissions

Noise (@ 1 metre)	74 dB(A) ³
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Electrical Supply

230V 50Hz
220V 60Hz
120V 60Hz
100V 50Hz
100V 60Hz

Storage & Transportation Environment

Ambient temperature	0 °C to 40 °C ⁴
Relative humidity	0-95% non-condensing
Altitude	Sea-level to 12,000 m

Operational Environment

Ambient temperature	0 °C to 30 °C
Relative humidity	0-95% non-condensing
Altitude	Sea-level to 1,600 m

Pressure Controller

Measuring range	1-1100 mbar
Dimensions (WxDxH)	195 x 178 x 105 mm
Weight	1.5 kg
Power consumption	30 W (@ 90-264 V, 50/60 Hz)

¹ Ultimate vacuum; operational values may vary

² Ultimate low temperature; operational values may vary

³ Actual dBA value may vary depending on equipment setup/composition

⁴ -10 °C permissible during transport only

All dimensions include allowances for pipe connections and lid opening.
Weights quoted are for guidance purposes only; actual system weight will vary depending on the modules selected.

