

## miVac concentrator range



# The miVac range

miVac from SP Scientific is a range of centrifugal concentrators capable of removing water and organic solvents from a variety of sample formats including tubes, microplates and vials.

Centrifugal concentrators 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 vapour 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.

A modular system, which can be configured to suit different applications, the miVac range comprises two concentrators, three pumps and a novel refrigerated trap. The miVac Pressure Controller helps to further optimise 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.

For guidance when choosing a bespoke configuration for your application, please see the flow chart opposite.

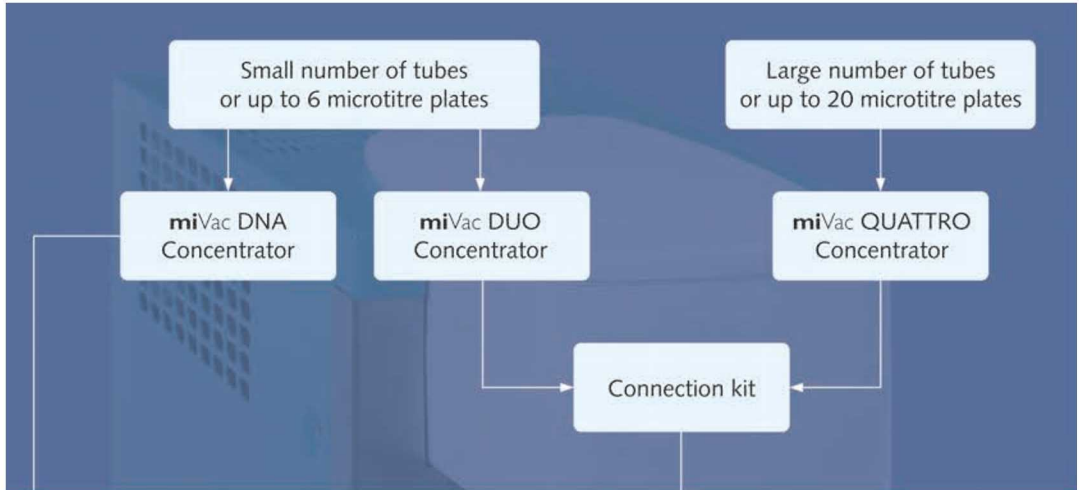
With a wide variety of easily interchangeable rotors, miVac evaporators are suited to many different tasks and applications. These include drying or concentration in microcentrifuge tubes, conical centrifuge or other plastic tubes, glass vials, and shallow or deep well microplates. Applications range 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 optimise concentration times. Typical results with water show that miVac systems are up to 40% faster than comparable machines.

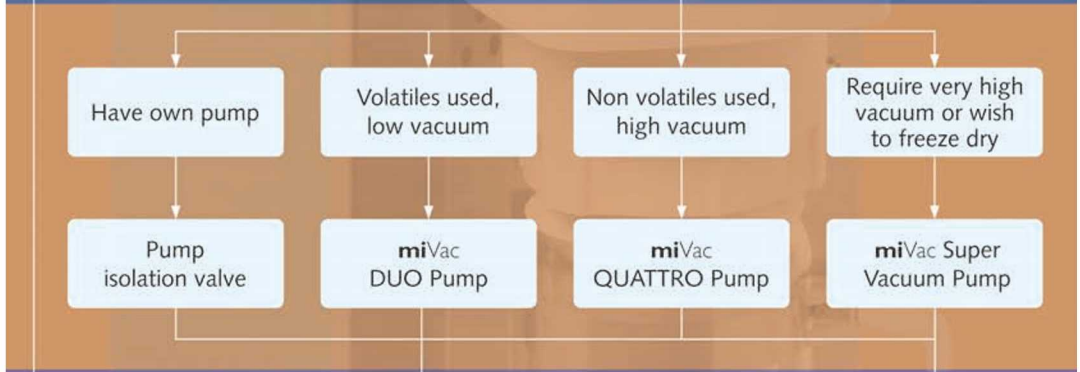
The compact size of the miVac concentrators saves valuable bench space. Their simple, robust design will ensure years of reliable service even when used intensively, such as in teaching or multi-user laboratories. Intuitive controls allow inexperienced users to get first-class results first time with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



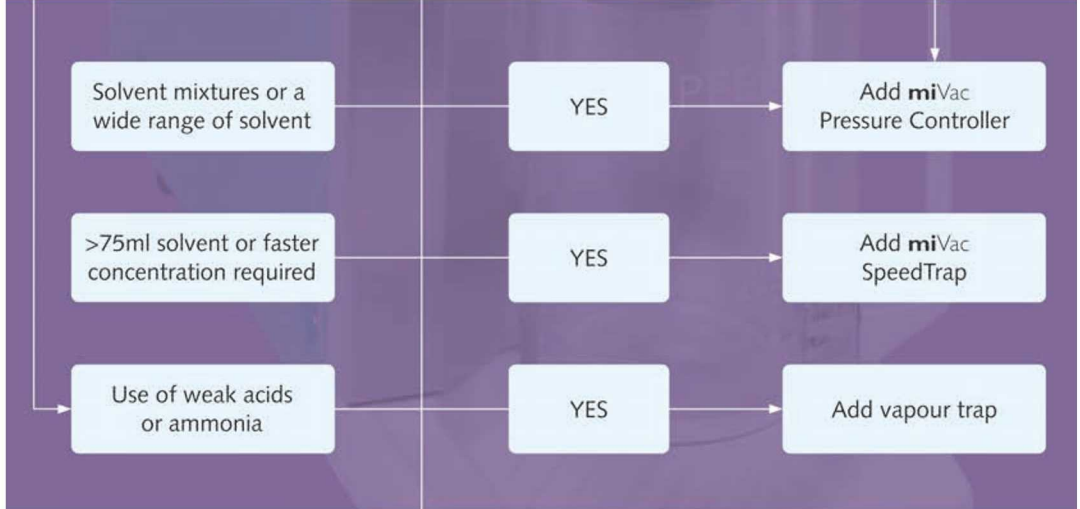
## Choose your concentrator



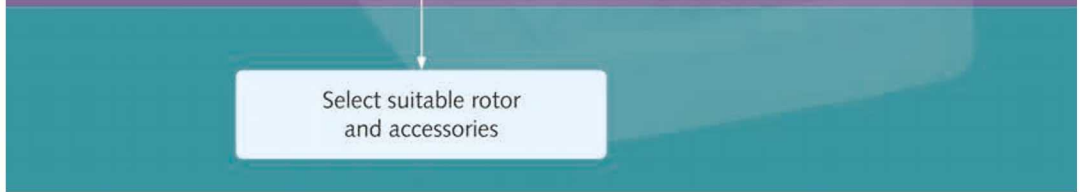
## Choose your pump



## Choose your condenser and traps



## Choose your rotor





## DNA system

The miVac DNA integrated system is a centrifugal concentrator 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 for 48 1.5 or 2ml 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.

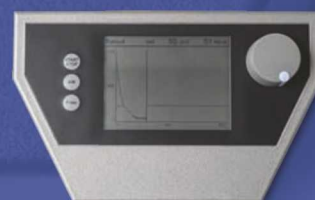
## Pressure controller

Pressure control enables the user to set the optimum boiling (and therefore condensation) temperature for the solvent which is being concentrated 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, concentration 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.



## Modular systems

For a wider range of solvents and/or a larger range of sample formats select a 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.



## Duo and Quattro concentrators

The 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 bowl, 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 specialised programmes for water, alcohols and other solvents. The intuitive controls and a large display make miVac very easy to use. Setting is simple, with just one 'set and select' control knob and a minimum of keys. All status and programme information is displayed alphanumerically on the large LCD display, giving every user confidence in their run conditions and results.



*miVac Quattro*



## 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 four-head diaphragm pump which can reach pressures of 2mbar or below, 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 0.15mbar.

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.

## SpeedTrap

The miVac SpeedTrap is a uniquely designed high power cold trap used to condense solvent vapours. When a cold trap condenses vapours 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 vapour path; solvent vapours 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.



**The SpeedTrap has three settings:**

### 1. Automatic defrost

For collection of solvents liable to freeze. 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.

### 2. Continuous chilling

For collection of solvents that do not freeze above  $-50^{\circ}\text{C}$ . 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.

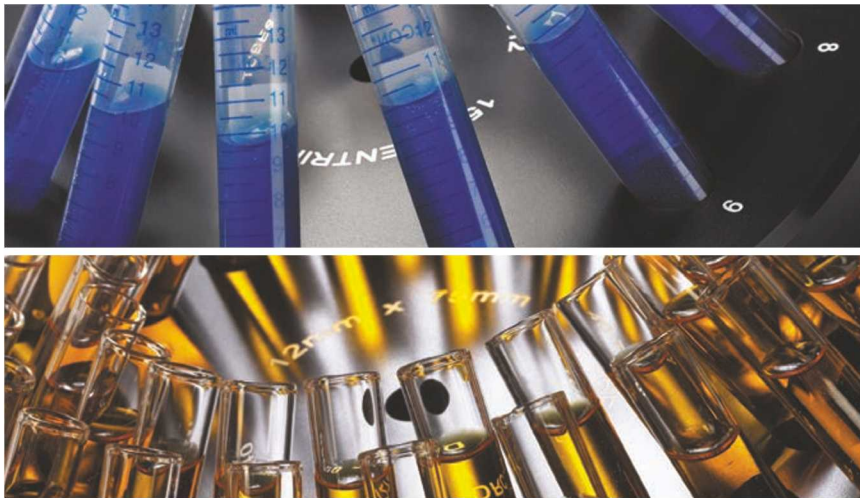
### 3. Manual defrost

When continuous chilling is used with solvents which freeze above  $-50^{\circ}\text{C}$ , 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.



Super Vacuum Pump





## Sample holders

miVac are the only concentrators of 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.



**JETROTORS™**  
INCREASE YOUR POWERS OF CONCENTRATION

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 250ml of water or other suitable solvent. Samples to be dried may be placed in a rotor in the miVac concentrator and 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 drier. 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, 3 freeze drying valves, 3 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 drier and a concentrator. In such situations we recommend using the miVac pressure controller to allow selection of optimal vacuum levels for each process.



# Mechanical data

	<b>miVac Duo Concentrator</b>	<b>miVac Quattro Concentrator</b>	<b>miVac DNA Concentrator</b>
Dimensions mm (in.) WxDxH	360 x 424 x 300 (14.2 x 16.7 x 11.8)	480 x 594 x 300 (18.9 x 23.4 x 11.8)	360 x 597 x 300 (14.2 x 23.5 x 11.8)
Max g-force	250	250	250
Vacuum connection	0.5in. or 12.7mm	0.5in. or 12.7mm	Inbuilt Duo pump
Weight	21kg (46.3lbs)	35kg (77.2lbs)	34kg (75lbs)
Temperature range	Ambient, 30°C -80°C	Ambient, 30°C -80°C	Ambient, 30°C -80°C

	<b>miVac Duo Pump</b>	<b>miVac Quattro Pump</b>	<b>miVac Super Vacuum Pump</b>
Vacuum level (Maximum)	10mbar	<2mbar	0.15mbar
Flow rate	38 l/min (2.3m <sup>3</sup> h)	33 l/min (2m <sup>3</sup> h)	83 l/min (5m <sup>3</sup> h)
Vacuum connection	0.5in. or 12.7mm	0.5in. or 12.7mm	0.5in. or 12.7mm
Outlet connection	3/8in. or 9.5mm	3/8in. or 9.5mm	3/8in. or 9.5mm
Dimensions mm (in.) WxDxH	215 x 394 x 300 (8.5 x 15.5 x 11.8)	215 x 394 x 300 (8.5 x 15.5 x 11.8)	249 x 427 x 288 (9.8 x 16.8 x 11.3)
Weight	13kg (28.6lbs)	18kg (39.6lbs)	23kg (50.7lbs)

## miVac SpeedTrap

Temperature	Minimum temperature -50°C. Nominal operating temperature -35°C
Cooling power	134 watts
Glass vessel capacity	1 litre
Ice capacity when freeze drying	250ml
Vacuum connections	0.5in. or 12.7mm
Dimensions mm (in.) WxDxH	212 x 563 x 450 (8.3 x 22.2 x 17.7)
Weight	25kg (55.1lbs)

Contains fluorinated greenhouse gasses which are hermetically sealed within the equipment. Refrigerant gas R449A; GWP 1397; Charge 0.064kg; CO<sub>2</sub>e less than 0.1 tonnes.

## miVac Pressure Controller

Display range	0 to 1100mbar
Control	1mbar increments
Connections	0.5in. or 12.7mm
Dimensions mm (in.) WxDxH	195 x 178 x 105 (7.7 x 7.0 x 4.1)

## Services

Power supply	230V 50Hz 120V 60Hz 220V 60Hz 100V 50/60Hz
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**Genevac Limited** The Sovereign Centre Farthing Road Ipswich IP1 5AP UK  
Tel: +44 (0) 1473 240000 Fax: +44 (0) 1473 461176

**Genevac Inc** 3538 Main Street Stone Ridge NY 12484 USA  
Tel: (1) 845 267 2211 Fax: (845) 267 2212  
salesinfo@genevac.co.uk www.spscientific.com



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