miVac

Concentrator range

Speeding your concentration, improving your drying

What is a Centrifugal Vacuum Concentrator?

The principle behind centrifugal vacuum concentrators is very simple; as atmospheric pressure 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, depending upon solvents used and the vacuum level applied. 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.

Samples are placed in a rotor inside the vacuum chamber. The rotor is spun, the vacuum pump switched on, and if required, heat to speed evaporation is provided by electrical heaters in the centrifuge wall. Solvent vapour boiling off the samples is then pumped away by the vacuum pump. Unless a refrigerated condenser or cold trap is used, the flow rate of the vacuum pump limits the speed of concentration. A well designed cold trap, such as the miVac SpeedTrap is used to recover the waste solvent before the pump which further speeds the process by maintaining a good vacuum in the system.

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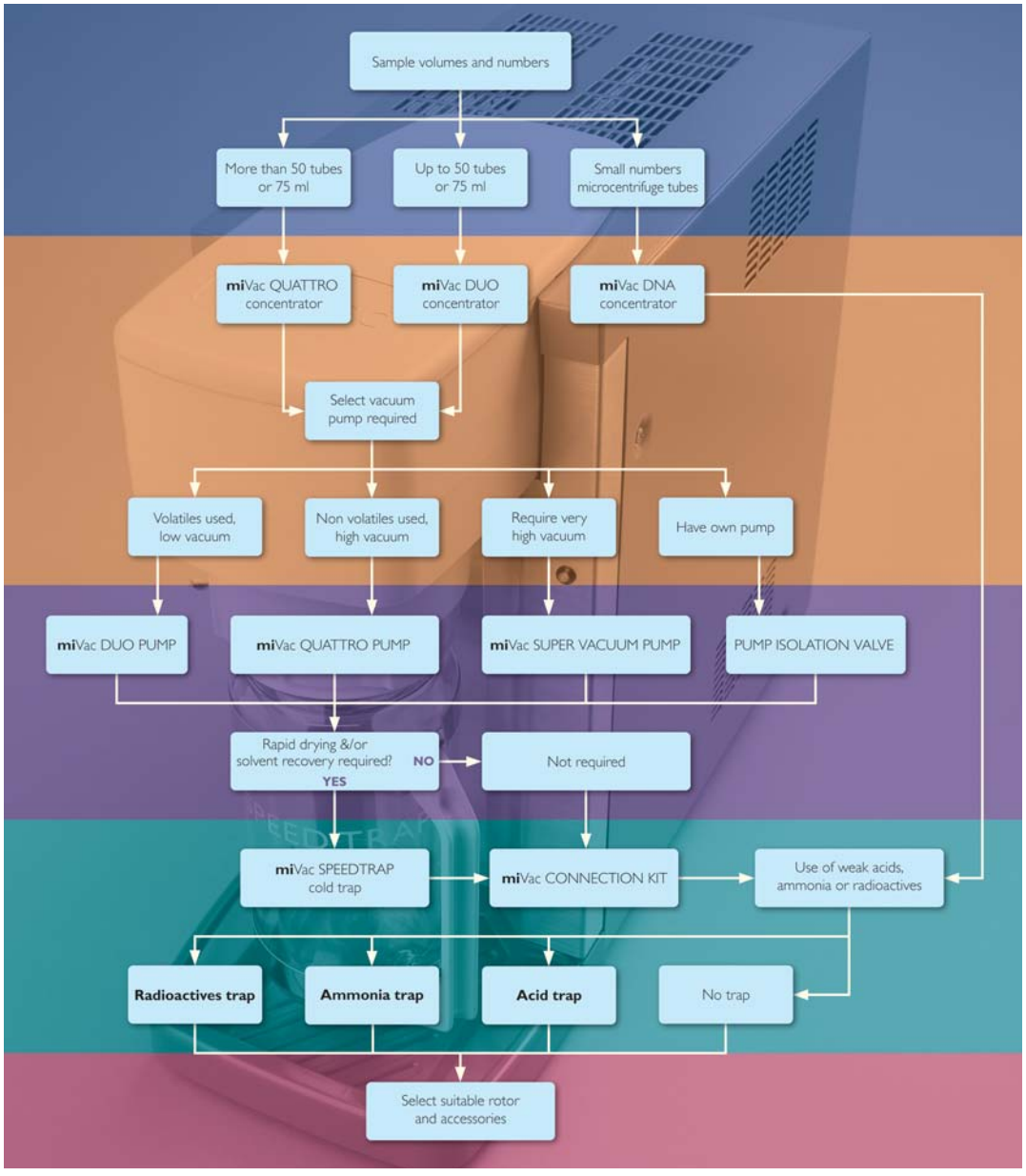
Introducing the miVac range

miVac from Barnstead Genevac is a new range of centrifugal concentrators capable of removing water and organic solvents from a variety of sample formats including tubes, microplates and vials. There are three concentrators, three pumps and a novel refrigerated trap in the miVac range. miVac concentrators feature built-in special methods for working with alcohols, water and water mixtures to improve performance and optimise concentration times. There are two sizes of system available; the larger Quattro concentrator and the smaller Duo. 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. There is a choice of medium or high vacuum pump and a dedicated DNA system with built-in pump. Rotors are chosen according to the type of sample format in use and can include both deep and shallow well microplates, glass vials and tubes. Rotors are easily interchangeable.

miVac is the first concentrator system with modules designed to work together – and look good.

Choosing your system



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DNA system

The miVac DNA integrated system is a centrifugal concentrator capable of removing water and organic solvents from a variety of sample formats including tubes, microplates, and vials. It is designed specifically for working with nucleic acids and is supplied complete with everything the scientist requires; built in high performance vacuum pump, concentration chamber with electro-magnetic drive for quiet, maintenance free operation, and a fixed angle aluminium rotor for 1.5 ml microcentrifuge tubes. Simply position the system on the bench, connect the power lead and exhaust tube and look forward to faster, trouble free concentration!

The clear acrylic lid allows you to monitor progress and is specially treated with a novel coating to resist the most aggressive chemicals and solvents. The miVac DNA system is everything you would expect of a DNA concentrator, and more!

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. For a wider range of solvents and/or a larger range of sample formats select miVac Duo or Quattro concentrator with miVac SpeedTrap and pump.

The miVac DNA system is very simple to use. Concentration time and temperature are readily monitored on the large clear display. Parameters can be easily set and selected using the friendly dial. To improve performance there are built-in special modes for working with water and alcohols, which optimise concentration time.
Concentration using the miVac DNA is faster than any other system in its class, due to the high displacement vacuum pump.

Specifications	
Dimensions mm (in.) WxDxH	360x597x300 (14.2x23.5x11.8)
Max g-force	250
Pump details	See Duo Pump on page 6
Weight	34 kg (75 lbs)
Temperature range	Ambient, 30°C - 80°C

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miVac Duo and Quattro Concentrators

miVac concentrators are extremely quiet when in use and typical results with water show that miVac systems are up to 40% faster than comparable machines, due to the very high displacement pumps.

Performance can be further enhanced through the use of the miVac SpeedTrap refrigerated condenser – see page 7 for details. A large clear acrylic lid allows you to monitor the drying process and is specially treated with a novel coating to resist the most aggressive chemicals and solvents.

These two precision-engineered systems allow you to safely concentrate your samples or take them through to complete dryness. The miVac Duo system has been designed to accept a two-swing position microplate holder or disc rotors for tubes and vials.

The miVac Quattro is a bigger system with a larger capacity bowl, enabling it to use a four-swing position rotor and much higher capacity disc rotors. In both swing rotors, each position for shallow well microplates can accept multiple plates through the use of stackers, so that a miVac Duo can hold six shallow plates.

In the larger miVac Quattro, up to twenty shallow-well microplates or eight deep-well plates can be used simultaneously, vastly increasing your throughput and slashing drying times.

With such a wide variety of available rotors, the miVac evaporators are suited to many different tasks. These include drying or concentration in microcentrifuge tubes, conical centrifuge or other plastic tubes, glass vials and shallow or deep well microplates. miVac concentrators can be used in a wide range of application areas such as ADME / toxicology, polymer chemistry, DNA, RNA & peptides, oligosynthesis, forensics / drugs of abuse testing, food science and agrochemical research.

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

The large display makes miVac very easy to use and can show the actual temperature and elapsed time. Setting is simple, with just one 'set and select' 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.

Specifications	Duo	Quattro
Dimensions mm (in.) WxDxH	360x424x300 (14.2x16.7x11.8)	480x594x300 (18.9x23.4x11.8)
Max g-force	250	250
Vacuum connection	0.5 in. or 12.7 mm	0.5 in. or 12.7 mm
Weight	21 kg (46.3 lbs)	35 kg (77.2 lbs)
Temperature range	Ambient, 30°C - 80°C	Ambient, 30°C - 80°C

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miVac Duo and Quattro Vacuum Pumps

There is a choice of three oil-free pumps to complement the miVac concentrators according to your application. For most people, the high-displacement miVac Duo Pump will be quite sufficient to give excellent results with either the miVac Duo or Quattro concentrator. This quiet and compact two-head diaphragm pump will remove 38 l/min (2.3 m^3 h) of solvent vapour and is housed in a smart case to match the other miVac components. It is suitable for removing solvents that boil below 130°C, including water, methanol, ethanol and their mixtures.

For more demanding applications, such as higher boiling-point solvents up to 175°C, we recommend the miVac Quattro Pump, as this four-head diaphragm pump can reach pressures of 1mbar or below, which are needed for successful drying of medium boiling point solvents. Both pumps are controlled automatically by the miVac evaporation chamber.

Exceptionally demanding uses, involving very high-boiling point solvents up to 200°C will require a special scroll-type vacuum pump as used on larger Genevac systems. This pump is capable of routinely removing high-boiling solvents at pressures down to 0.15 mbar. You should consult your local sales person about the exact pump configuration your application requires.

Specifications	Duo Pump	Quattro Pump	Scroll Pump
Vacuum level (Maximum)	10 mbar	<1 mbar	0.15 mbar
Flow rate	38 l/min (2.3 m^3h)	17 l/min (1 m^3h)	83 l/min (5 m^3h)
Vacuum connection	0.5 in. or 12.7 mm	0.5 in. or 12.7 mm	0.5 in. or 12.7 mm
Outlet connection	3/8 in. or 9.5 mm	3/8 in. or 9.5 mm	3/8 in. or 9.5 mm
Dimensions mm (in.) WxDxH	210x389x300 (8.3x15.3x11.8)	210x389x300 (8.3x15.3x11.8)	249x427x288 (9.8x16.8x11.3)
Weight	13 kg (28.6 lbs)	18 kg (39.6 lbs)	23 kg (50.7 lbs)

miVac accessories

miVac connection kit.

A range of optional accessories is available for the miVac series –

All Duo or Quattro concentrators will need the miVac connection kit. This contains all that is needed to turn the separate units of the miVac series into a fully integrated system. It includes vacuum tubing, a tube cutter, catch pot, and pump control lead.

When working with chemicals that may be harmful, such as acids, ammonia, or radioactive materials, a range of vapour neutralising traps is recommended. A vapour wash bottle with either acid or ammonia neutralising solution is available for use with these chemicals. Solutions change colour when exhausted, indicating when they need to be changed. For neutralising radioactive vapours an activated carbon trap is available. Traps are fitted after the pump and before the vapour is discharged to atmosphere or fume extraction system.

For users who are short of bench space, a robust cart is available. This sturdy cart with locking castors will take either a concentrator, or a pump plus a SpeedTrap and comes with two shelves.

MCK-00000-Y00	*miVac connection kit*
VAP-TRAP0-100	*Trap for neutralising acid or ammonia vapours, requires neutralising solutions*
NH3-REF00-100	*Ammonia neutralising solution 4 x 500 ml*
ACD-REF00-100	*Acid neutralising solution 4 x 500 ml*
RAD-KIT00-100	*Activated carbon radioactives trap*
CRT-10000-200	*Cart with two shelves and locking castors*

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SpeedTrap

The miVac SpeedTrap is a novel high power cold trap used to condense solvent vapours. Cold traps can seriously improve the performance of any vacuum concentration system. When a cold trap condenses vapours back to liquid, there is a corresponding massive volume reduction helping to pull a vacuum; speeding up the concentration process considerably. When choosing a cold trap, it is important to note that condensing power is more important than low trap temperatures.

Most traditional traps are large and cumbersome, based on a stainless steel vessel with cooling coils attached to the outside. The trap is connected in the vapour path between the concentrator and the pump. The vessel walls are chilled to sub zero temperatures by a gas compressor system, similar to that used in a refrigerator.

These older traps are inefficient and difficult to use, and if water is condensed it freezes, and must then be defrosted before the trap can be emptied. Some systems require the use of an interchangeable glass flask and thermal transfer fluid; however a flask covered in slippery cold silicone fluid at -40°C may become a dangerous liability when it needs to be emptied.

The miVac SpeedTrap is radically different. It is very small in size and requires little bench space, being only 212 mm (8.3 in.) wide. The SpeedTrap operates in a unique way. The cold condenser coils are suspended directly in the vapour path, solvent vapours condense directly on to the coils and run off into the collection vessel below without freezing, even when using water. There are huge benefits to this method; it is highly efficient, with more than twice the condensing power of a similar system, the user can quickly see the solvents in the trap, and emptying the trap is easy, requiring no defrosting. The collection vessel is removed with a simple quarter turn, allowing safe disposal of the solvents. What could be easier?

miVac SpeedTrap is supplied with a one litre glass condensing vessel, a two litre option is available for users evaporating very large solvent volumes.

The SpeedTrap jar is extremely easy to remove and empty, requiring just a quarter-turn.

Specifications	
Minimum temperature	-50°C
Cooling power	134 Watts
Refrigerant medium	R404A
Glass Vessel Capacity	1 litre as standard, 2 litres with option
Vacuum connections	0.5 in. or 12.7 mm
Dimensions mm (in.) WxDxH	212x563x450 (8.3x22.2x17.7)
Weight	25 kg (55.1 lbs)

Ordering Information

Using the chart on page three, simply select the concentration system components you require, not forgetting connection kit, accessories, and rotors*. Please note miVac system part numbers vary by voltage and country and are therefore not shown here. A full list is available from your local distributor. Information on the connection kit and accessories is found on page six. The most popular rotors are listed below. A full list can be found on the miVac website. A custom rotor service is available to ensure that you gain best use of your system. If you are unsure of the rotor or system you require, or need further information, please contact your local distributor, or visit www.miVac.co.uk for details.

Rotor Options

DNA Integrated System / Duo Concentrator

Part number	Capacity	Description
*DRC-15EPP-048	48	1.5 ml microcentrifuge tubes
DRC-15EPP-120	120	1.5 ml microcentrifuge tubes
DRC-05EPP-120	120	0.5 ml microcentrifuge tubes
DRC-MIXEP-048	48	24 off 1.5 ml and 24 off 0.5 ml microcentrifuge tubes
DRC-15CCT-010	10	15 ml conical based centrifuge tubes (17 mm x 120 mm)
DRC-50CCT-010	6	50 ml conical based centrifuge tubes (28 mm x 115 mm)
DRC-01275-040	40	12 mm x 75 mm tubes
DRC-13100-032	32	13 mm x 100 mm tubes
DRC-18100-008	8	16 to 18 mm x 100 mm tubes
DRC-18150-006	6	18 mm x 150 mm tubes
DRC-12V40-060	60	12 mm x 40 mm vials
DRC-15V45-024	24	15 mm x 45 mm (1 dram) vials
DRC-28V60-012	12	28 mm x 60 mm (20 ml) scintillation vials
DRS-00000-200	Swing rotor with two microtitre plate positions	
BRS-STK00-004	Set of four stacker plates to allow up to three shallow well plates to be loaded per swing of the two place rotor	

Quattro Concentrator

Part number	Capacity	Description
QRC-15EPP-200	200	1.5 ml microcentrifuge tubes
QRC-15CCT-052	52	15 ml conical based centrifuge tubes (17 mm x 120 mm)
QRC-50CCT-048	48	50 ml conical based centrifuge tubes (28 mm x 115 mm)
QRC-01275-200	200	12 mm x 75 mm tubes
QRC-16100-100	100	16 mm x 150 mm tubes
QRC-18150-032	32	18 mm x 150 mm tubes
QRS-00000-400	Swing rotor with four microtitre plate positions	
BRS-STK00-004	Set of four stacker plates to allow two deep well plates to be loaded per swing of the four place rotor	
BRS-STK00-016	Set of sixteen stacker plates to allow up to five shallow well plates to be loaded per swing of the four place rotor	

*48 place rotor supplied with DNA system

Barnstead | GeneVac

Barnstead International, 2555, Kerper Blvd, Dubuque, IA 52001
Tel: +1 800 553 0039 Fax: +1 563 589 0516

Genevac Ltd, Farthing Road, Ipswich, UK, IP1 5AP
Tel: +44 (0) 1473 240000 Fax: +44 (0) 1473 742987

www.mivac.co.uk