

Rocket Synergy and Rocket 4D Synergy Evaporators



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 WRITTEN PERMISSION OF:

ALL DIMENSIONS ARE IN MILLIMETRES
 Tolerances unless otherwise stated:
 ±0.05mm for two place decimals
 ±0.10mm for one place decimals
 ±0.50mm for nominal dimensions
 ±0.10° for angles
 ✓ surface finish for machined faces

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Issue: Date:

Icons: Sig:

ROCKET ASSEMBLY

N/A

N/A

Equipment

Scale:
 Drawn: P
 Checked:
 Drawing: N

Revolutionary Rocket Synergy

Rocket Evaporators use patented vacuum technology to evaporate solutions to dryness, or a concentrate, rapidly and safely. The latest Synergy series offers integrated, flexible solutions for processing a wide range of sample volumes. Interchangeable rotors will accommodate tubes, flasks and batch volumes of up to 100L.

Two models are offered:

Rocket Synergy, will evaporate samples in flasks, tubes, or a variety of innovative Genevac sample holders such as the SampleGenie. The removable rotor may be replaced with a 5L 316 stainless steel vessel for batch processing.

Rocket 4D Synergy is designed primarily to evaporate large sample volumes, with autofeed if required. The Rocket 4D Synergy can also be fitted with a removable flask rotor to accommodate the full range of Rocket Sample handling solutions such as flasks, tubes and SampleGenie.

Rocket technology

Using a single, common vacuum pump, the Rocket creates two vacuum environments:

1 a low vacuum causes the solvents in the sample to boil at a low temperature, often below 0°C;

2 a second vacuum environment boils deionised water to make low temperature, low pressure steam. The temperature of the steam heating the vessel or flasks in the Rocket is controlled in this way, while the temperature of the aluminium outer chamber is also carefully controlled at the user's set temperature.

Solvents boiling in the flasks or vessel will cause cooling, therefore the steam created by the Rocket will condense on the cold outer surface of the flask or vessel.

Condensation of steam releases energy into the samples to speed evaporation, without heating the samples themselves. Condensed steam is thrown off due to the rotational force and re-boiled to make more steam.

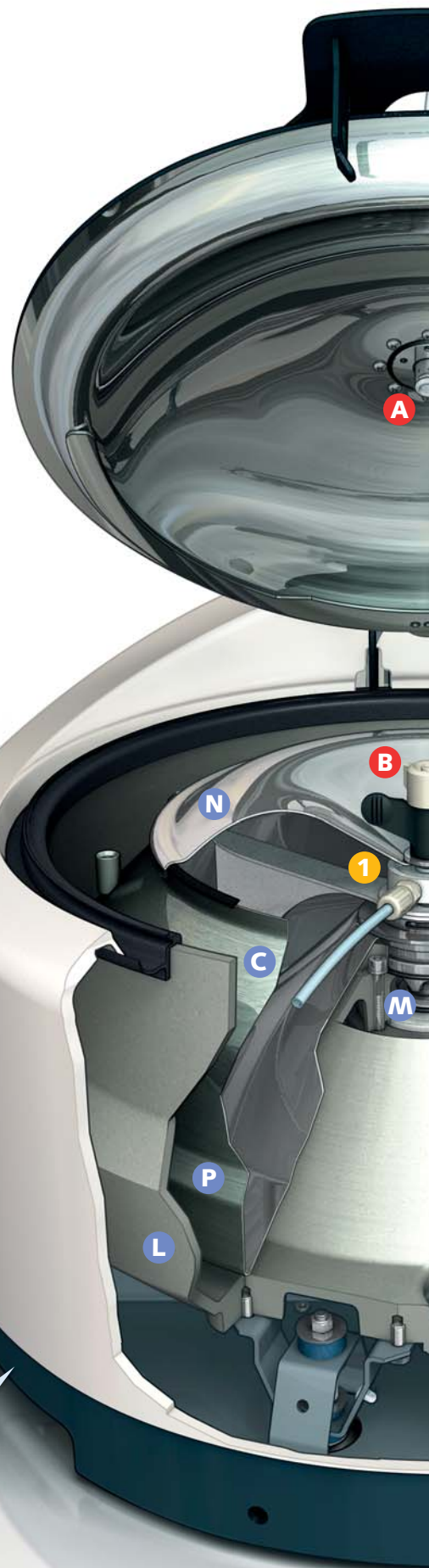
Features of the Rocket 4D Synergy only:

- A** Autofeed coupling enables large volumes of solvent to be fed into the evaporation vessel under control of the evaporator, to ensure safe, rapid evaporation or concentration.
- B** Autofeed option with sample feed via centre of inner lid.

Features common to both the Rocket and Rocket 4D Synergy:

- C** Removable 316 stainless steel vessel – holds up to 5 litres of sample (batch mode; Rocket and Rocket 4D Synergy), or can be used to evaporate larger samples with autofeed (Rocket 4D Synergy).
- D** Removeable flask rotor will accommodate the full range of sample handling solutions including tubes, flasks and SampleGenie.
- E** Auto-draining frost-free solvent condenser, collects all solvents as liquids. Plastic coated glass for safety and visibility.
- F** Easy to use controls. Select the method for the solvents to be evaporated, set the maximum safe temperature and start.

ROCKET4D
SYNERGY
SPACE AND TIME FOR SCIENCE

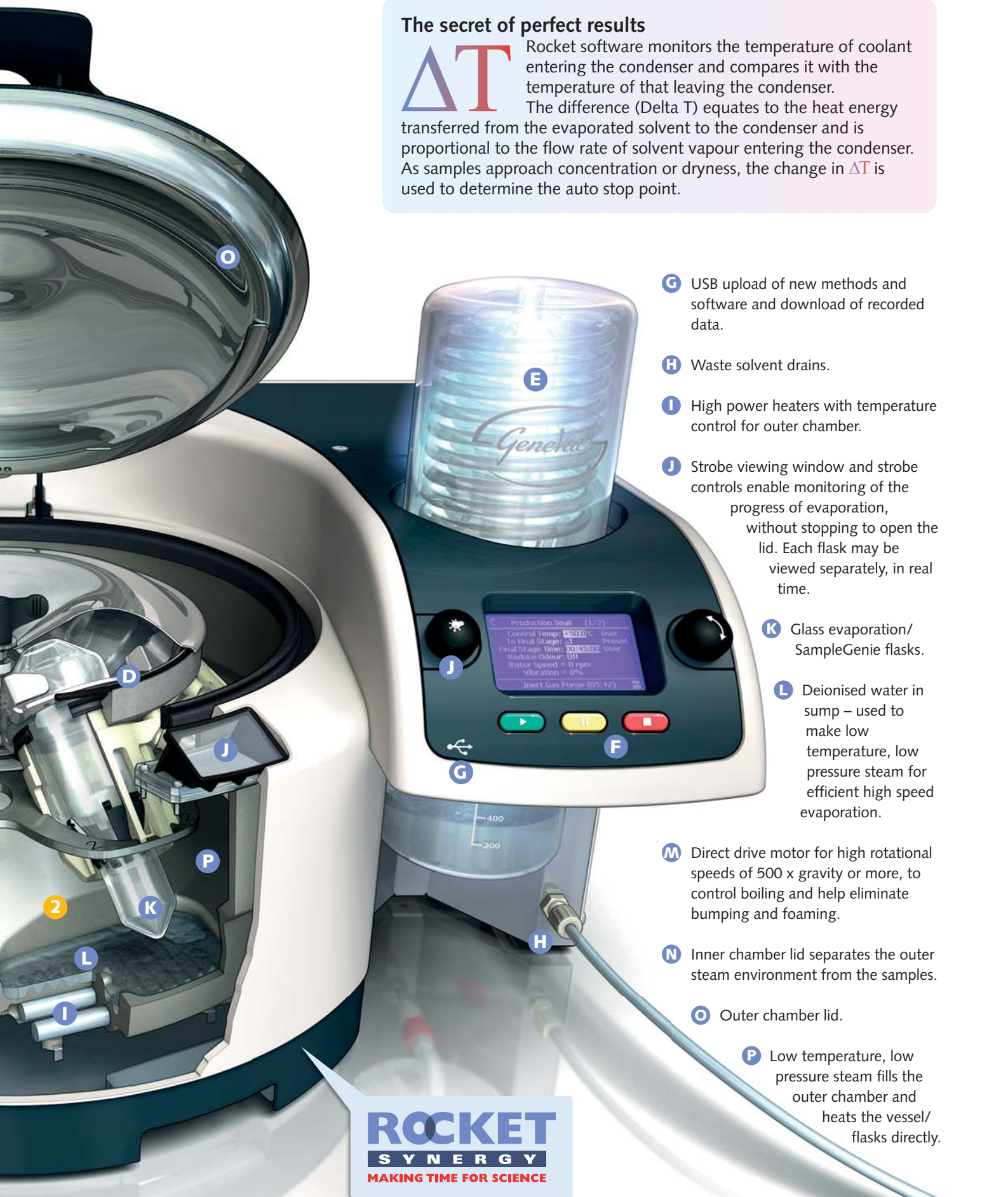


The secret of perfect results

ΔT

Rocket software monitors the temperature of coolant entering the condenser and compares it with the temperature of that leaving the condenser.

The difference (Delta T) equates to the heat energy transferred from the evaporated solvent to the condenser and is proportional to the flow rate of solvent vapour entering the condenser. As samples approach concentration or dryness, the change in ΔT is used to determine the auto stop point.



- G** USB upload of new methods and software and download of recorded data.
- H** Waste solvent drains.
- I** High power heaters with temperature control for outer chamber.
- J** Strobe viewing window and strobe controls enable monitoring of the progress of evaporation, without stopping to open the lid. Each flask may be viewed separately, in real time.
- K** Glass evaporation/ SampleGenie flasks.
- L** Deionised water in sump – used to make low temperature, low pressure steam for efficient high speed evaporation.
- M** Direct drive motor for high rotational speeds of 500 x gravity or more, to control boiling and help eliminate bumping and foaming.
- N** Inner chamber lid separates the outer steam environment from the samples.
- O** Outer chamber lid.
- P** Low temperature, low pressure steam fills the outer chamber and heats the vessel/ flasks directly.

Make time for science with the Rocket Synergy

- No waiting – five times faster than other 'intelligent' evaporators
- Perfect results – no monitoring or intervention required for excellent sample recovery
- Error free – eliminates foaming, bumping and cross-contamination
- Easy to use – simple controls and intelligent software
- Space saving – one Rocket replaces several rotary evaporators
- Sample volumes from 60ml up to 5 litres
- Environmentally friendly cold traps and advanced methodology provide very high solvent recovery

ROCKET
SYNERGY
MAKING TIME FOR SCIENCE



The Rocket Synergy high speed evaporator is designed to dry or concentrate up to six flasks, each containing a maximum of 450ml of solvent, or 18 ASE® vials, with no user intervention or attention. The removable flask rotor may also be replaced with a 5 litre stainless steel vessel for batch processing (see *Rocket 4D Synergy* section for more details). It is five times faster than other 'intelligent' evaporators and is capable of replacing several rotary evaporators, saving valuable bench space.

Using SampleGenie™ or Flip-Flop™ sample handling systems further extends the scope of the Rocket Synergy. These enable up to 450ml to be concentrated or dried directly into a smaller vial, increasing sample recovery and inter-sample reproducibility, while eliminating the drudgery associated with manual transfers. Methods on every Rocket Synergy can easily be optimised, and new methods uploaded via USB key. Data is downloaded in the same way.

The Rocket has an on-board strobe that allows each of the six flask positions to be viewed separately in real time.

Further information on how to concentrate with the Rocket can be found at:
www.Genevac.com/CFA

See the Rocket demonstration at:
www.Genevac.com/movie/Rocket



Rocket controls are very easy to use. Load your samples, select the correct method, press start and walk away. The evaporator is equipped with high performance features that prevent foaming, bumping and cross contamination. A built-in cold trap provides very high levels of solvent recovery, even with volatile organic solvents. Auto-draining, under the control of the Rocket, ensures optimal solvent recovery is maintained under all conditions.

Innovative Rocket sample handling choices – what else?

Evaporation Flasks

For drying or concentrating up to 450ml solvent.

- 450ml volume
- Dried sample is re-dissolved and removed using a pipette



Puck

Enables up to 18 ASE® vials to be dried in one operation, in place of flasks.



250ml SampleGenie™

For drying the sample directly into a range of vials from 12mm to 28mm diameter and up to 70mm tall. SampleGenie™ eliminates the need for manual transfers, saving time and preventing sample handling errors.

- 250ml volume plus vial
- Direct drying of sample into vial
- Eliminates manual transfers



400ml SampleGenie™

for concentrating the sample directly into 2ml GC autosampler vials. The vial is protected from the steam, so that only the solvent in the flask evaporates.

- Insulated vial
- Sample in the flask evaporates – not in the vial
- Eliminates manual transfers, graduated washing steps and errors



Flip-Flop™

is for users of ASE® vials who wish to concentrate their samples and also have them presented in a GC autosampler vial. It consists of a special double-ended tube with SampleGenie™ adaptor and 2ml GC vial.



- Works in combination with the Puck to enable direct concentration into a 2ml GC vial

Rocket 4D Synergy – space and time for science

ROCKET4D

S Y N E R G Y

SPACE AND TIME FOR SCIENCE

- Press and go – fully automated from start to finish
- Big capacity - can process up to 100 litres in one operation
- Interchangeable rotors for batch or flask/tube formats
- Error free – eliminates bumping and foaming
- Light work – effortless emptying of vessel using pouring stand
- Powerful cold trap provides improved solvent recovery and drying of samples
- Quick clean – so easy compared with large glass evaporator flasks



Rocket 4D Synergy is a fully automated system for drying or concentrating very large volumes with no user intervention and in complete confidence – no bumping, foaming or sample loss. Simply load your sample, select the correct method, press start, and walk away – the system will do the rest.

Solvents in the vessel are boiled under a separate vacuum and so will be at much lower temperature than the steam surrounding the vessel. By spinning the product vessel at high speed, the g-forces generated control the pattern of boiling so that bumping and foaming are eliminated.



Above: The 5 litre 316 stainless steel vessel can be used for batch processing, or in conjunction with the autofeed option.

Right: The vessel is easily removed and replaced with a flask rotor.

The Rocket 4D Synergy can also be fitted with a removable flask rotor to accommodate the full range of Rocket Sample handling solutions such as flasks, tubes and SampleGenie (see *Rocket Synergy* section for more details).

Fitted with the 5 litre stainless steel bowl rotor, Rocket 4D Synergy can process any volume from just a few litres to as many as 100. It uses Rocket technology to heat a single product vessel accurately with low temperature, low pressure steam.



Perfect drying of volumes up to 100 litres

Rocket 4D Synergy's 5 litre 316 stainless bowl rotor has detachable handles and is easily lifted into and out of the evaporator. Access to the dried or concentrated product in the vessel is very easy. Dried products can be scooped out, or re-dissolved while the vessel is still in the system. Liquid products can be easily drained via a drain port in the side of the rotor, using a dedicated pouring stand.

Users wishing to dry volumes larger than five litres should choose the 'Autofeed' option, which enables the Rocket 4D Synergy to draw in product from the user's own external supply. The Rocket 4D Synergy controls product feed, drying and the discharge of condensed waste solvent without any external intervention.

The autofeed system has an integrated rinse circuit, which washes the system through with compatible clean solvent and then air, to prevent drying of product in the autofeed mechanism. Dried products may be automatically re-dissolved in a small volume of solvent at the end of the process, using solvent from the rinse system. Alternatively, the same circuit can be used under manual control for solvent exchange by substituting a different solvent for re-dissolve.

Cleaning the Rocket 4D Synergy between cycles is very straightforward. The PTFE feed tubing is easily detached for cleaning or replacement and the vessel can be readily cleaned, wiped, inspected and even put in a dishwasher. It's all so easy compared with handling large glass evaporator flasks!



A typical Rocket 4D Synergy autofeed system, with recirculating chiller option.

Easily controlled emptying



Mechanical data

Blue = Rocket Synergy. Red = Rocket 4D Synergy. Black = both.

Maximum speed	1800rpm
Maximum G-force	700g
Drive system	Direct drive
Maximum sample load	6 x 450ml / 5 litres
Maximum imbalance	50g / self balancing

Vacuum system

Pressure display	0-1200mbar
Pressure control	Automatic / 3mbar / 0.5mbar to atmosphere
System ultimate vacuum	3mbar / 0.5mbar
Bumping / foaming protection	Dri-Pure®

Temperature and control

Control range	Ambient +7°C to 60°C
Control accuracy	±1°C
Temperature sensing	Via thermistor
Display range	0°C to 60°C
End of method	Time or automatic
Process visualisation	Strobe & Delta T

Solvent compatibility

Boiling point range	40°C to 160°C at ambient
Includes	Alcohols, DCM/methylene chloride, DMF, ethyl acetate, water
HCl	Not compatible
Di-ethyl ether	Requires Inert Gas Purge option (compatible with flask rotor only) / N/A

Dimensions

Width x Depth x Height	720 x 640 x 530mm
Headspace required	755mm (lid open)
Weight	75kg / 70kg

Services

Rocket Synergy requires one of the following electrical supplies,

Rocket 4D Synergy requires two of each (excluding chiller)

UK & Europe	230V (±10%), 50Hz, 13A
USA	120V (±10%), 60Hz, 15A
Japan	100V (±10%), 50Hz or 60Hz, 15A
USB A	For data upload and download

Deionised water	50K to 1M Ohm approx. 50ml per day
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Rocket 4D Synergy feed configuration

Feed	6mm OD PTFE hard wall tube
Drain	8mm OD PTFE hard wall tube
Rinse solvent for feed system	1 litre of compatible solvent for every 20 litres fed product
Liquid sample recovery	Via port or 3/8" or 1/2" hose barb

Cold trap cooling requirement

Temp range	-20°C to +10°C dependent upon application
Heat removal	700 Watts at +10°C 1500 Watts at +10°C
Flow rate	1.5 to 2.5 l/min
Pressure	1 (min) to 7 bar (max) static
Connections (to chiller):	8mm nylon hardwall tube for Genevac supplied chiller Quick connect coupling to chiller or female M16 fine thread to other sources 1/4 inch (6.5mm) hose barb for cold water connection (standard).

Recirculating chiller

Powerful recirculating chillers are available for the Rocket Synergy and Rocket 4D Synergy evaporation systems. The systems can control the chillers via RS232 links, thereby providing improved solvent recovery and better drying of samples compared with using a static cooled supply. Connection kits with insulated pipe work are available to accompany the chillers.



Chiller specification

Width x Depth x Height	320 x 500 x 600mm 500 x 760 x 640mm
Weight	48kg / 85kg
Cooling power	500W at 10°C / 1500W at 10°C
Electrical connections	As evaporator

Maintenance

All seals are durable consumables and user replaceable. Easy access is provided to the pump, which can be maintained by trained users.

Safety

Conforms to UL 61010-A-1:2002 & BS EN 61010-1:2001 for laboratory equipment.
CE certified.



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