The Genevac Rocket™ Evaporation System

User Manual

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Part Number **04-6276**

Contents

Introduction

The Genevac Rocket Evaporation System

The ***Genevac Rocket Evaporation System*** is designed for ease of use and very fast concentration or drying times.

User interface is via twist-and-press menu control system, coupled to an LCD screen. Simple menu options provide quick access to everyday functions and advanced features are intuitive to use. The menu screen displays at-a-glance system status information.

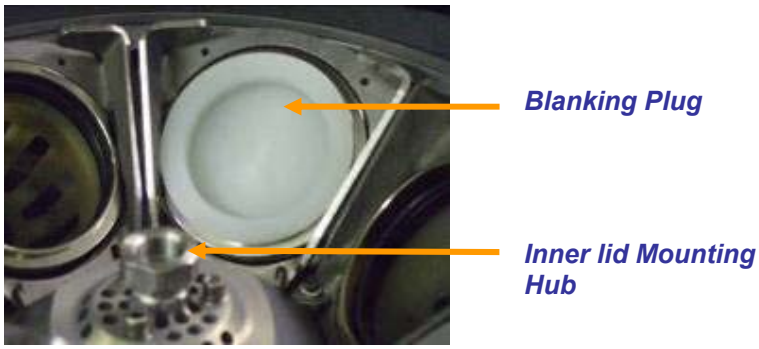
Samples can be monitored using the sample viewing window in conjunction with a variable timing strobe system (this is an optional feature).

Simple start, stop and pause keys are used to control the evaporation process.

The evaporator automatically records log files which can be used for method certification purposes. A USB port allows connection of a data storage device (not supplied) so that log files can be downloaded for transfer to a remote computer. Software upgrades or new methods can also be uploaded via a USB data-key.

Waste solvent is recovered by a highly efficient vapour condenser, which then drains the waste solvent automatically. The plastic coated glass condenser is powered by cold water from an external source.

There are various methods of supplying coolant to the condenser. Genevac supply a re-circulating cooler which can be controlled, remotely, by the evaporator. Several evaporators can be connected to a single re-circulating cooler (in which case remote control is not possible) or coolant can be supplied from a running cold water supply.

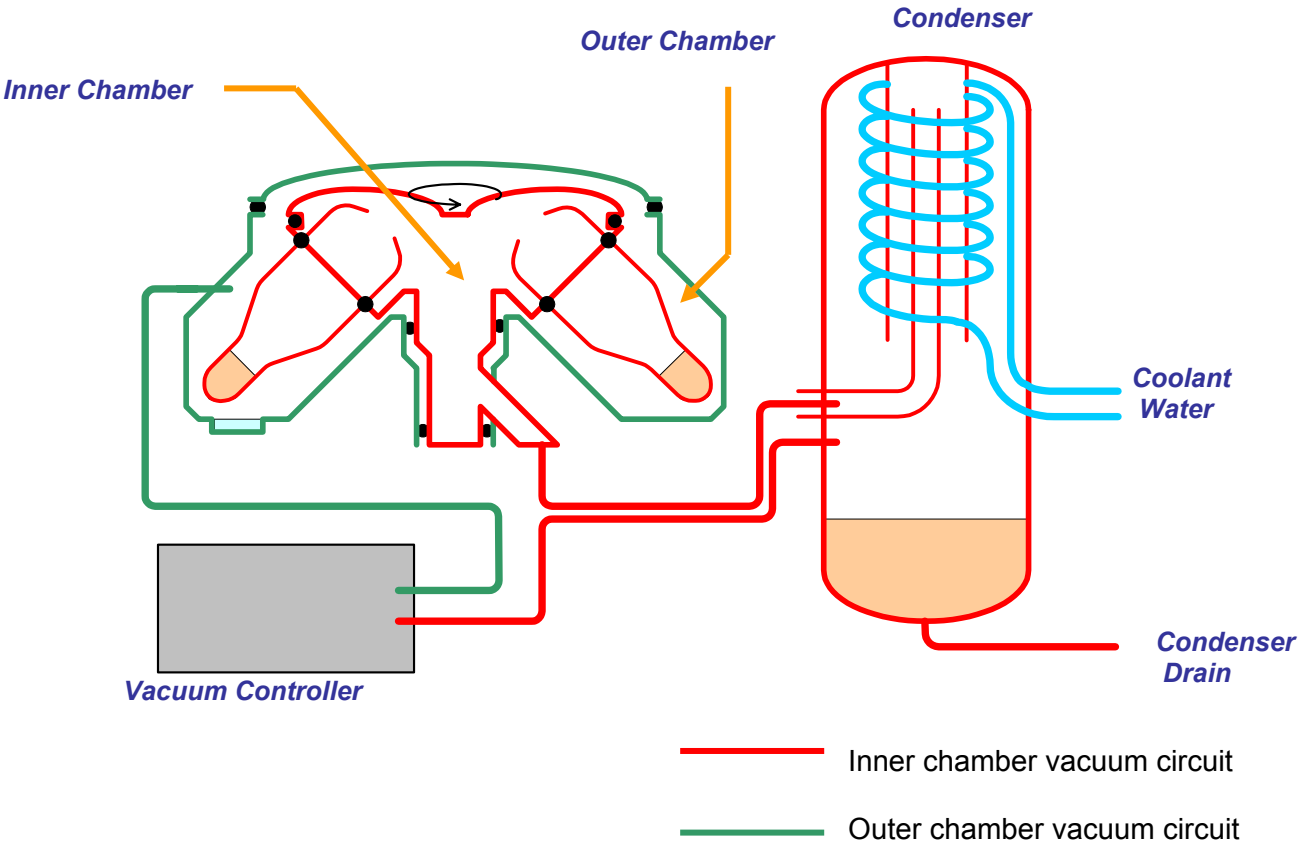


The main evaporator lid is locked electronically during operation to prevent unsafe opening. It is opened manually to provide access to the main vacuum chamber and inner lid. A thumb screw releases the inner lid allowing access to the rotor. The rotor is compatible with Genevac Standard drying flasks or the Genevac SampleGenie™ flask-into-vial concentration system.

The main lid isolates the vacuum system from the outside world. With the inner lid and sample flasks fitted, a seal forms between the inner (rotor) chamber and outer chamber, allowing independent vacuum control of each. The flask seals form an air tight seal when the rotor spins, and release to allow unimpeded loading and unloading of the sample flasks when the rotor is stationary. This is achieved by a unique seal clamping system which applies force, compressing the flask seals, under centrifugal acceleration.

It is essential that the flasks and flask seals are kept clean and in good condition. Unused rotor positions must be fitted with blanking plugs (or sealed with empty flasks).

Vacuum System Schematic



Safety

Hazard Caution or Warning Symbol

This warning symbol is used throughout this manual. When used in conjunction with:

Caution:

It indicates hazards that can lead to material damage.

When used in conjunction with:

Warning:

It indicates hazards that can lead to material damage and / or potential injury.

Safety Precautions

Always observe these safety precautions when using the evaporator:

- Ensure the exhaust hose is connected to a suitable laboratory fume extraction system
- Place the system in a ventilated space
- Clean up any solvent spillage within the evaporator immediately
- Empty the waste solvent vessel before every use
- Dispose of waste solvents in accordance with local environmental regulations
- Refer to the list of acceptable solvents before use
- Take care when using the optional strobe function. Persons in the vicinity may suffer adverse effects if prone to epileptic seizure.

Combustible Solvents

Please note it remains the responsibility of the user to consider safety when evaporating any combustible solvents. The Genevac position regarding evaporation of such solvents, particularly with respect to the European ATEX directive, is available on our website or from your local sales representative.

Limitations of use

Your evaporator is not suitable for use under these circumstances:

- With strong mineral or halogenated acids such as HCl and HBr at any concentrations
- Evaporating Diethyl Ether and similar low auto-ignition solvents (unless fitted with an Inert Gas Purge System)
- For evaporating solvents with a boiling point greater than 160°C at atmospheric pressure.
- For use as a pressure vessel.

Lid Operation

The electrically operated lid lock is controlled by a system of safety sensors. The lid cannot be opened while the rotor is spinning, the evaporator is under vacuum or when the power is switched off.

Electrical Earthing

This system must be earthed. This Evaporator is a Safety Class I product according to IEC classification. It must never be used with any interruption to the safety earth conductor. It is an Installation Category II product and is intended to operate from a normal single phase supply.

Operating Environment

This evaporator is designed to be used in a pollution degree I environment (no pollution or only dry non-conductive pollution).

Recommended Practice

A few general rules for safe operation of the system:

- Only permit users, familiar with all the issues outlined in this manual, to operate the equipment
- Do not start or restart a system without checking the rotor is balanced and correctly loaded
- Do not place any objects on top of the evaporator
- Take care when loading; incorrect loading may result in damage to samples and / or the evaporator and could void the warranty
- Maintain a solvent free environment around the evaporator; do not use free space around the evaporator for storing vessels that contain solvents or acids
- Follow the maintenance and cleaning procedures outlined within this manual.

Caution: Maintenance procedures must be carried out by a competent person.

Method Guide

The evaporator is supplied with a number of preloaded methods. If any or all of these standard methods are unavailable, it is likely they have been overwritten (deleted). See ***Copy Methods to Datakey*** for advice on the safe keeping of methods.

Caution: Do not attempt to evaporate high boiling point solvents (160º C or above at atmospheric pressure). This includes DMSO, DMI and NMP. Attempting to evaporate these solvents is likely to cause damage to the evaporator vacuum system.

Caution: Do not attempt to evaporate strong halogenated acids (such as HCL and HBr) or mineral acids at any concentration.

List of Acceptable Solvents

These commonly used solvents are compatible for use with the evaporator. Solvents are grouped according to boiling point and the table shows the appropriate method to use for each group. Contact your local Genevac agent for advice on solvents which are not listed, or for information about obtaining bespoke methods.

Note: Methods that have been edited may no longer be optimised for use with the solvents listed.

Method Location	Standard Method (Solvent group)	List of Acceptable Solvents
01	***Very Low BP***	Dichloromethane (DCM) **Diethyl Ether **Pentane
02	***Low Boiling Point***	Acetone Acetonitrile (ACN) Butyl Acetate Chloroform (TCM) 1,2-Dichloroethane (DCE) *Dioxane Ethyl Acetate *Heptane Hexane (Hex) Methanol Propan-1-ol or Propanol *Propan-2-ol or isopropyl alcohol (IPA) *Pyridine Tetrahydrofuran (THF) Trifluroacetic Acid (TFA)
03	***Medium BP***	Acetic Acid Ammonium Hydroxide (NH_3OH) *Ethanol (EtOH) Dimethyl Formamide DMF Formic Acid *Toluene Butan-1-ol *Butan-2-ol
04	***Aqueous***	Water
05	***Low BP Mixture***	Any mixture of low boiling point solvents (except DCM)
06	***Med & Low BP Mixture***	Any mixture of medium and low boiling point (refer to rest of table)
07	***HPLC Fractions*** (Water / organic mixture)	Water / Acetonitrile or Methanol
08	***DCM mixture***	Dichloromethane (DCM) and other miscible solvents and no traces of water

* Some solvents can be placed into more than one group. For instance, they may evaporate using either the ***Low Boiling Point*** or the ***Medium Boiling Point*** method. In this case, use ***Low Boiling Point*** to optimise solvent recovery, or ***Medium Boiling Point*** to reduce evaporation time.

** **Warning:** Do not attempt to evaporate Diethyl Ether, pentane or other similar low auto-ignition solvents unless the evaporator is fitted with an Inert Gas Purge system.

Quick Reference Guide

Power

Connect mains, switch on power

Optional Julabo Re-circulating Cooler
Power switch

Controls

Strobe
Press and follow on-screen instructions

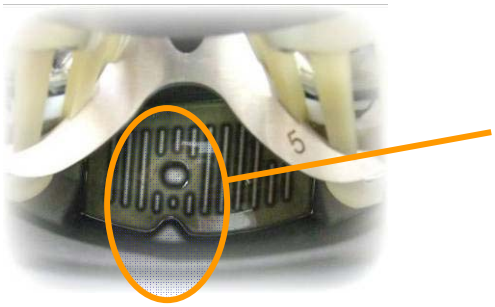
Menu Control
Navigate menu screens
Turn to scroll, press to select

Run Controls
Start, stop and pause

Vacuum Chamber Reservoir

Use deionised water only (resistivity 50,000 to 1 megohm at pH >6.5 and particulate free).

Volume required to fill from empty: 250ml.



Correct water level:

Above low water level marker, below high water level marker

Warning: The outer lid and inner lid may reach temperatures up to 60°C when the evaporator is operating.

Getting Started

Use this quick reminder to get started. For more detailed descriptions of features and operating procedures: refer to the relevant sections within this user manual.

1. Switch the evaporator on.

   If ***Sys Use Checks*** appear on the screen, complete each check and press the menu control. The ***Method Select*** menu will open when all checks have been completed.

2. Switch on the re-circulating cooler or turn on the coolant supply.

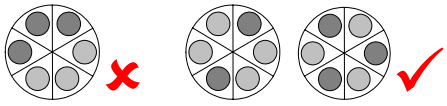
3. Inspect the condenser and drain it if any solvent is present; select the ***Drain Condenser*** option from the ***Method Select*** menu.

4. Empty the waste solvent container.

5. Check the water level in the ***Vacuum Chamber Reservoir***. It must be between the low (circular) marker, and the high (triangular) marker. Refer to the ***Vacuum Chamber Reservoir*** illustration on the opposite page, and top up if necessary.

6. Load the rotor.

   Balance opposing samples within 10g. Avoid cumulative rotor imbalance by distributing minor weight variances around the rotor.



   Fit blanking plugs or empty standard flasks to unused rotor positions.

7. Select the required method from the ***Method Select*** screen.

8. Press the start key .

   If ***Pre-Run Checks*** appear on the screen, complete each check and press the menu control. The method will commence when all checks have been completed.

   During evaporation, the screen displays information relating to sample drying progress.

   The evaporator will stop automatically. Alternatively, the method may be paused or stopped manually.

9. Unload the samples after the evaporator stops.

Switching On

Evaporator

Ensure the evaporator is installed in accordance with the instructions in the section entitled: ***Installing the System.***

Switch on power to the Evaporator.

Note: After switching the evaporator off, wait 10 seconds before switching on again.

Evaporator Power Switch

The software boot-up sequence commences.

If the ***Commissioning*** checks or ***Sys Use*** checks functions are enabled, these checklists appear on the screen now. Go through the commissioning checklist and press the Menu Control to confirm each step has been completed; go through the Sys Use checks and press the start key to confirm each check has been completed.

The ***Method Select*** menu opens when all the checks are complete.

Note: ***Commissioning*** checks and ***Sys Use*** checks, can be enabled or disabled from the ***Options*** menu.

Julabo Re-Circulating Cooler

Switch on power to the re-circulating cooler. The unit performs a short self test, and then displays the software version before starting up.

Re-circulating Cooler Power Switch

Providing the comms lead is connected and ***remote mode*** is enabled, the re-circulating cooler starts and displays the current coolant temperature. The evaporator then assumes control of the re-circulating cooler.

Note: The re-circulating cooler display shows ***rOFF*** if the evaporator is off or in standby mode.

Refer to the re-circulating cooler Operating Manual for further details.

Cold Water Supply

Turn on the cold water supply.

Note: The evaporator controls the coolant flow by opening and closing an internal water valve. The water valve opens when the evaporator is operating, and closes to prevent wastage when the evaporator is switched off or idle.

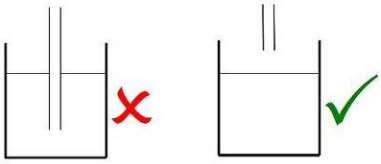
Preparation

Evaporator

1. Check the condition of the waste solvent drain hose. The drain hose must provide unimpeded drainage of waste solvent into the waste solvent container.

Waste solvent drain hose

The end of the waste solvent hose must not be allowed to submerge below the level of the waste solvent.



2. Check the condenser. Drain any waste solvent from the condenser.

3. Empty the waste solvent container. Ensure the end of the waste solvent hose remains above the level of the waste solvent

Note: Waste solvent may drain periodically whilst the evaporator is operating.

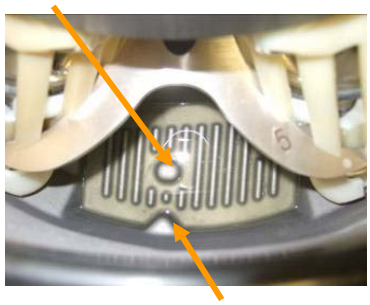
Caution: Do not start the evaporator if the waste solvent container is disconnected. Do not remove the waste solvent container while the evaporator is opearating.

4. Check the level of water in the chamber water reservoir. It must be between the high and low level markers. Top up with distilled water if necessary.

   Correct water level:

Chamber Water Reservoir

Low level marker



High level marker

- Above the circular low level marker
- Below the triangular high level marker

Alternatively, measure out 250ml of distilled water, if filling the chamber water reservoir from empty.

Note: Use only deionised water (resistivity 50,000 to 1 megohm at pH >6.5 and particulate free) in the chamber reservoir.

The evaporator is now ready for the samples to be loaded. Refer to the section entitled: ***Samples*** for details.

Condenser

Efficient solvent recovery and reduced evaporation times, can be achieved by optimising the condenser performance:

- Drain the condenser before every use
- Ensure the coolant supply temperature is appropriate for the (solvent group) application.

When using the Julabo re-circulating cooler (supplied by Genevac) ensure the evaporator is set up to control the re-circulating cooler automatically, as specified in the section entitled: ***Installation***. This will ensure appropriate coolant supply temperature at all times, the evaporator also switches the re-circulating cooler off when the system is idle.

- Connect the re-circulating cooler to the evaporator via the comms lead supplied
- Set the re-circulating cooler to remote control mode. Refer to the re-circulating cooler Operating Manual for details.

Evaporator Serial Port

Re-circulating cooler Serial Port

If an alternative re-circulating cooler is used (or if the Julabo re-circulating cooler comms lead is not connected) the coolant temperature will have to be set manually. The optimum coolant supply temperature for each solvent is defined within the appropriate method. To find the appropriate coolant temperature, select ***View Method*** from the ***Method Select*** menu, and scroll down to find the ***Chiller Set Temp***.

Do not set coolant temperatures lower than +2°C when evaporating water

Refer to the re-circulating cooler Operating Manual for details of how to check and top up the coolant level. Use a 50% water, 50% glycol mixture.

If the condenser coolant comes from a running cold water supply, ensure the supply conforms to requirements for temperature, pressure and flow rate. See ***Technical Specifications: Cold Water Supply***.

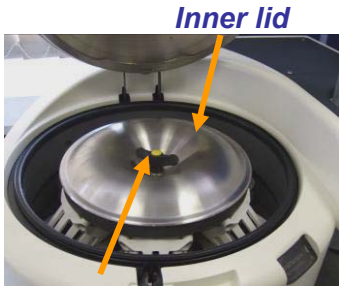
Samples

Caution: Ensure that flasks are clean and undamaged before every use. Scratched or damaged flasks may break causing unrecoverable sample loss and possible damage to the evaporator.

Warning: The outer lid, inner lid and sample flasks may reach temperatures of up to 60°C whilst the evaporator is operating. They may also be wet causing them to drip or be slippery when handled.

1. Open the outer lid.

   Note: The lid lock is electrically operated and is controlled by a system of safety sensors. The lid cannot be opened whilst the rotor is spinning, the evaporator is under vacuum or when the power is switched off.



Inner lid Thumb Screw

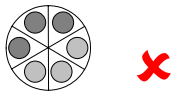
2. Remove the inner lid by unscrewing the inner lid thumb screw and lifting the inner lid away from the rotor. Store the lid safely.

Inner-lid Stand

3. Ensure the samples are balanced.

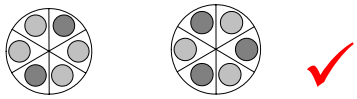
   Note: Whilst the evaporator can tolerate an imbalance of 40g across the rotor, it is recommended that individual samples should be balanced within 10g. Minor variations should be distributed evenly around the rotor to prevents cumulative rotor imbalance.

Rotor not balanced



Individual samples balanced within 10g, but cumulative imbalance across rotor.

Rotor balanced

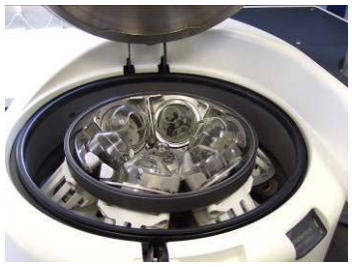


Samples balanced and minor variances distributed around rotor

Note: Do not fill the sample flasks above the safe fill level marker.

4. Load the sample flasks into the rotor. Carefully twist the flasks whilst easing into the rotor basket. Push the flasks all the way down, there should be very little resistance to insertion of the flask until the flask's shoulder rests against the rotor basket.

   Fit blanking plugs into any unused rotor positions. Empty standard flasks may be used as an alternative to blanking plugs.



5. Replace the inner lid and secure with the thumb screw. Turn the thumb screw clockwise until light resistance is felt. Tighten by continuing to turn clockwise for a further three quarters of a turn.

6. Close the outer lid.

The evaporator is now ready for use. Select the required method from the ***Method Select*** menu and press start key .

Operation

Method Select

Turn the menu control to highlight the menu options.

Press the menu control to select the highlighted option.

Select ***<BACK>*** to exit a menu screen.

Follow other instructions as they appear on the screen.

Starting and Stopping

1. Scroll to highlight the required method in the ***Method Select*** menu.
2. Press the start key to commence the method.
    - The evaporator displays the method settings momentarily whilst the rotor spins up
    - ***Pre Run Checks*** may appear on the menu screen (this function can be enabled or disabled using the ***Options*** menu). Complete the checks and press the start key
    - The evaporator vents to atmospheric pressure and stops the rotor spinning when the method is complete.
3. To over-ride the method and stop the evaporator manually:
    - Press the pause key The method can be resumed later
    - Press the stop key The method cannot be resumed

Note: Methods consist of several stages which commence consecutively, for example: All methods start with a system safety check which includes a lid integrity test. A ramping (dri-pure™) stage may then follow, then the evaporation stage, then a final drying stage.

Changing Method Settings while Evaporating

Method settings may be changed whilst the evaporation is in progress.

Using the menu control:

1. Press to enter the ***Method Edit*** menu.
2. Select the required parameter.
3. Scroll through the available setting options and select the required value.
4. Select ***<BACK>*** to return to method in progress screen. Alternatively the system returns automatically after a short time.

Note: A method is altered permanently when a setting is changed in this way. See ***Method Edit Menu*** for details. Methods that are locked (indicated by a locked padlock icon) cannot be changed.

Draining the Condenser

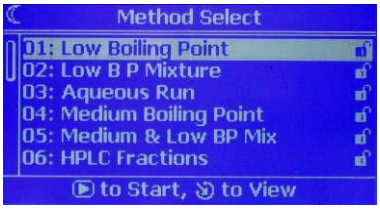
1. Select the ***Drain Condenser*** option from the ***Method Select*** menu.
2. Press the Menu Control or start key to confirm the request to drain.
   - The condenser drain valve opens for six minutes, allowing the condenser to drain
   - A countdown timer appears on the screen
   - The drain operation can be stopped by pressing any key

3. Inspect the condenser glass to ensure that all of the solvent has drained.
4. Empty the waste solvent container.

Note: A method may specify an automatic drain sequence between method stages or at end of method. Manual draining of the condenser will not be necessary in this case.

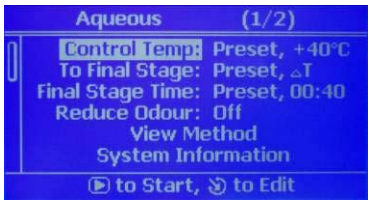
Menu Screens

Start at ***Method Select*** menu



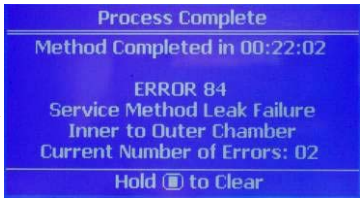
- ***01 Very Low BP***
- ***02 Low BP***
- ***03 Medium BP***
- ***04 Aqueous***
- ***05 Low BP Mixture***
- ***06 Med & Low BP Mixture***
- ***07 HPLC Fractions***
- ***08 DCM Mixture***
- ***09 No Method (spare)***
- ***10 No Method (spare)***
- ***System Test***
- ***Drain condenser***
- ***File Transfer***
- ***Options***
- ***Maintenance***
- ***View Last Method Graph***
- ***About***

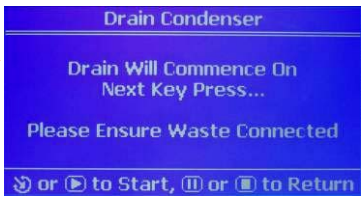
Press Menu Control

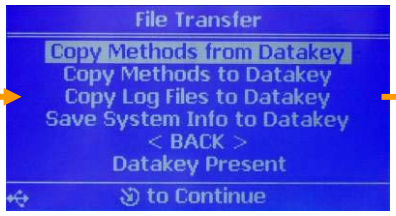


Edit Method

Commence Method



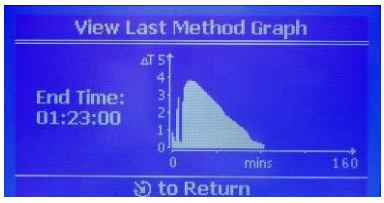




- Copy Methods from Datakey
- Copy Methods to Datakey
- Copy Log Files to Datakey
- Save System Info to Datakey

- Power Save
- Key Beep
- Audible Alarms
- Magnified Display
- Commissioning
- Sys Use Checks
- Pressure Units
- Temperature Units
- Iner Gas Blanket
- Inert Gas Purge
- Change IGP Password

- Next Log File Name
- System Hours
- Pump Hours
- Motor Hours
- Heater hours
- Condenser Hours
- Error History
- Water Valve



- Product
- Model
- Serial No
- Software Versions
- Copyright Info
- Sales / Service Contact details

Advanced Features

Method Edit

The evaporator can store up to ten individual methods, a number of standard methods are preloaded when new. Details of the preloaded methods can be found in the section entitled: ***Guide to Methods***.

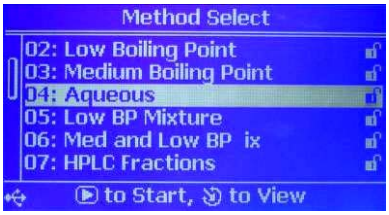
The Method Edit function allows the alteration of some method parameters in order to adapt methods for specific applications. When a parameter is changed, the ***Method Edit*** screen indicates this by omitting the word ***Preset*** from relevant line of text, and substituting the word ***User***.

Some methods are locked to prevent alteration. These methods are identified by a locked padlock icon. Locked methods may be overwritten using the file transfer function but cannot be altered using ***Method Edit***. See ***Transferring Method Files*** for details. This prevents standard methods being altered whilst retaining their standard method identity.

To avoid inadvertent loss of method settings, we recommend backing-up the original methods on a datakey for safe keeping. See ***Transferring Method Files*** for details.

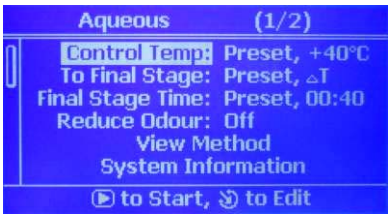
To access the ***Method Edit*** menu:

1. Select the required method.



Note: The padlock icon indicates whether a method is locked or unlocked.

2. Select the required method parameter.



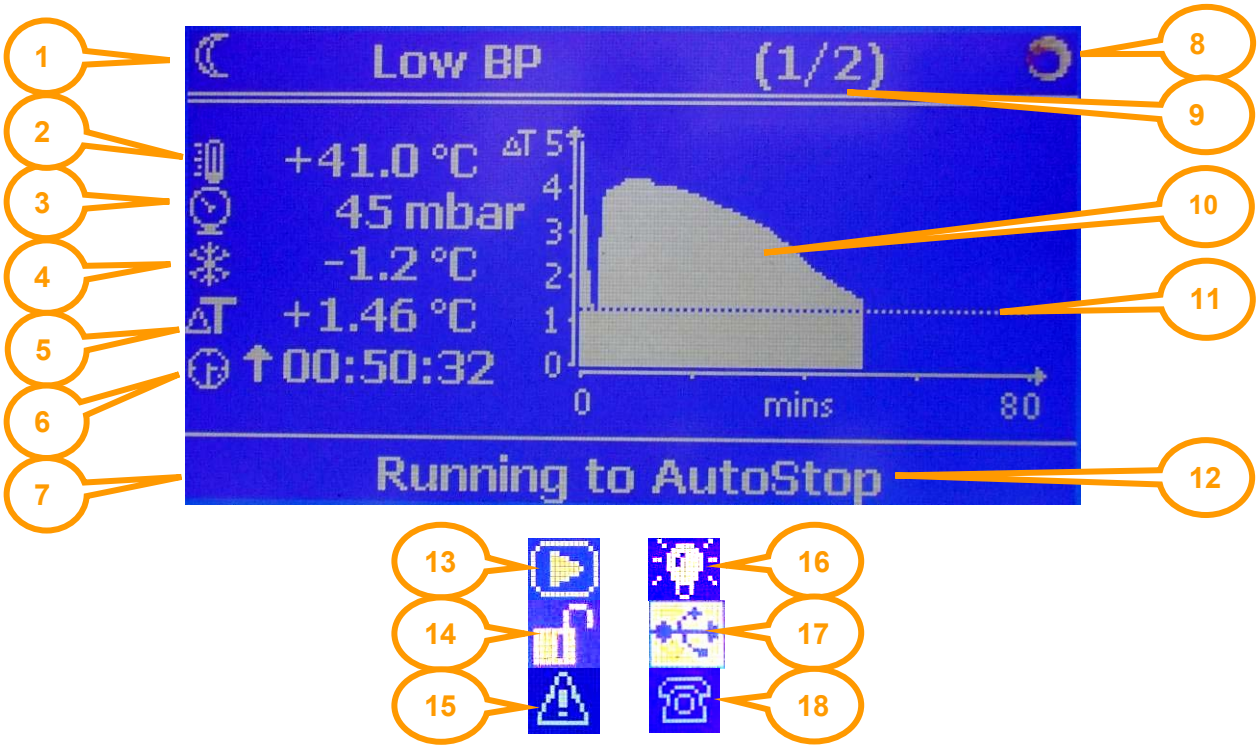
3. Turn the menu control to edit the parameter value. Press to select the new value.
4. The new value is accepted after a 5 second delay, select ***Back*** or allow the evaporator to exit the ***Method Edit*** menu automatically after a 30 second delay.

Available setting ranges for method parameters

Parameter	Setting Range	Effect
Control Temp	As method or/Set manually: no heat, or range 30°C-60°C	Sets the maximum temperature that the samples will reach.
To Final Stage	As method or set manually range 0.00 to 99:30 hours	Sets duration of method stages. **Auto:** system detects optimum time to stop or progress to next stage. **Timed:** system allocates time proportionately depending on method stages.
Final Stage Time	As method or set manually range 0.00 to 99:30 hours	Sets duration of the final drying stage.
Reduce Odour	Off, 50mbar, 100mbar, 200mbar	Enables vent and vacuum cycle at end of method to purge vacuum chamber of residual vapours. **Note:** Higher boiling point solvents require lower vacuum levels.
View Method	View all parameter settings relevant to the selected method.	
System Information	View the current status of all system parameters.	

Method in Progress

The menu screen displays information relevant to system status and sample drying progress when the evaporator is operating.



1. Power save function enabled
2. Water temperature
3. Inner (rotor) chamber vacuum
4. Condenser supply temperature
5. Delta T *
6. Elapsed method time
7. USB device connected and working
8. Rotor spinning
9. Method identity
10. ΔT graph
11. AutoStop trigger point
12. Current method stage
13. Press start key for function
14. Method not locked
15. An error has occurred
16. Strobe operating
17. USB device busy
18. Contact Genevac for advice

These are examples of commonly used screen icons. Other messages and graphics with intuitive meaning may also appear on the menu screen.

*For details, refer to the section entitled: ***Delta T***.

System Test

Automatically tests the integrity of the vacuum system. To gain meaningful results from the ***System Test***, the water must first be removed from the vacuum chamber reservoir, and all traces of solvent must be removed from the vacuum chamber.

Preparation

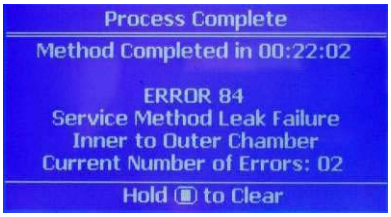
1. Remove the water from the ***Vacuum Chamber Reservoir***.
2. Drain the condenser.
3. Fit blanking plugs (or empty flasks) to all rotor positions.
4. Fit the Inner lid.
5. Select ***Medium BP*** method from the ***Method Select Menu.***
6. Press the start key and allow the method to operate for 1 hour.

   Note: the above procedure ensures all traces of water and solvent are removed from the vacuum system. The presence of water or solvent invalidates the test.
7. Turn off the re-circulating water cooler.

The ***System Test*** takes approximately 50 minutes to complete.

Perform System Test

8. Select ***System test*** from the ***Method Select*** menu.
9. Press the start key to commence the ***System test.***
10. Any faults encountered during the test are displayed on the menu screen in the form of short descriptive message and an error number. Refer to: ***Error Messages and Fault Finding*** for details. The menu screen also confirms the successful completion of a ***System Test***, with no error deteced.



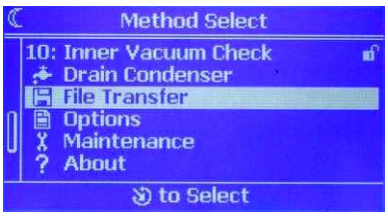
Note: Contact your local Genevac representative or Genevac Service Department for advice on decoding error numbers which are not listed in this manual.

File Transfer

New methods can be installed using the ***File Transfer*** menu. Bespoke methods are available from Genevac by email. Contact your local Genevac representative for details.

Copy Methods from Datakey

1. Select ***File Transfer*** from the ***Method Select*** menu.



2. Create a root folder entitled ***Rocket*** on a USB data key.
3. Download the new method to the USB data key ***Rocket*** root file.
4. Insert the data key into the evaporator USB socket located under the left hand side of the control panel. The evaporator acknowledges the presence of the data key by emitting a beep and displaying an icon on the menu screen.
5. Select the ***File Transfer*** option from the ***Method Select*** menu.
6. Select ***Copy Methods from Datakey***.

7. Select the required file or ***Copy all*** to commence the file transfer.
8. Select ***<BACK>*** to exit the ***File Transfer*** menu.
9. Remove the datakey.

Copy Methods to Datakey

To download methods from the evaporator:

1. Insert a datakey into USB socket, located under the left hand side of the control panel.
2. Select the ***File Transfer*** option from the ***Method Select*** menu.
3. Select ***Copy Methods to Datakey***.
4. Repeat the procedure if more methods require to be copied.
5. Select ***<BACK>*** to exit the ***File Transfer*** menu.
6. Remove the datakey.

Note: The evaporator creates a directory ***\ROCKET\ARCHIVE*** in which to store the methods. Downloaded files may be transferred to other evaporators. They may be kept and used to recover evaporator method settings should methods inadvertently be lost.

Copy Log Files to Datakey

Data is collected during the progression of a method. The resulting log files may be used for method verification purposes.

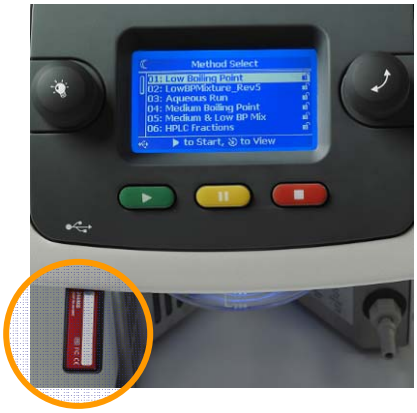
Each log file is assigned an eight digit reference number. The first four digits of the reference number are the evaporator serial number. The next four digits form a unique identifier which increments upwards with each successive use.

The evaporator's internal memory can hold up to four completed run log files. The oldest log file is overwritten once the memory is full. Alternatively, connect a USB data key before commencing the method. The evaporator logs files directly to the data key.

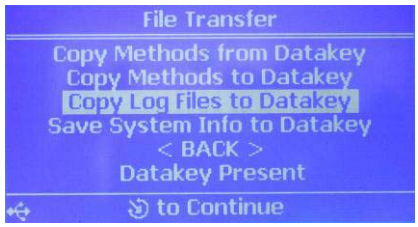
Note: Log files record temperature in °C and pressure in millibar, regardless of the pressure and temperature unit options selected from the Options menu.

To retrieve internally logged files from the evaporator:

1. Insert a USB data key into the USB port located beneath the left hand side of the control panel. The evaporator acknowledges the presence of a data key by emitting a beep and displaying an icon on the menu screen.



2. Select ***File Transfer*** from the ***Method Select*** menu.
3. Select ***Copy Log Files to Datakey***.



4. Select the log file to be copied.
5. Repeat the procedure for any remaining log files that require to be copied.
6. Select ***<BACK>*** to exit the ***File Transfer*** menu.

Upload the log files from the data key to a PC.

Save System Info to Datakey

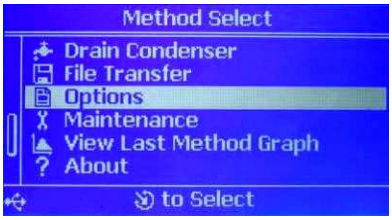
Downloads information to datakey, which is useful for method verification or for troubleshooting.

1. Insert datakey into USB socket, located under left hand side of the control panel.
2. Select the ***File Transfer*** option from the ***Method Select*** menu.
3. Select ***Save System Info to Datakey***.

Open the downloaded file on a PC to view calibration settings, error history and method settings.

Where method parameter settings have been changed using ***Method Edit***, the new value is shown. If method settings are unchanged, this is confirmed by the word: ***Preset***.

Options



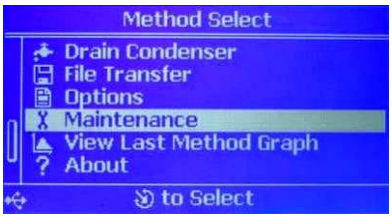
There are choices in the ***Options*** menu that affect the way information is presented on the display, some functions can also be enabled or disabled. Select ***Options*** from the ***Method Select*** menu.

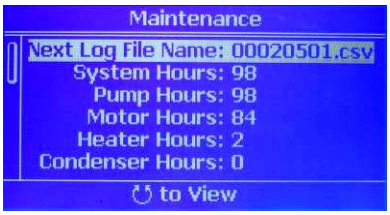
Options and their functions

Power Save	On/Off	Switches off power after 30 minutes if no user intervention.
Key Beep	On/Off	Disables key beep.
Audible Alarms	On/Off	Disables audible alarms.
Pre Run Checks	On/Off	Displays shows safety check list before allowing run to start.
Magnified Display	On/Off	Graphic / numeric display replaced by timer count up (or count down if end time is defined) after 5 minutes with no intervention from user.
Commissioning	On/Off	Displays information useful during installation. The option to disable this function is offered at subsequent start-ups.
Sys Use Checks	On/Off	Displays extended check list at start of every 10th run.
Pressure Units	m/t	Displays pressure in millibar or Torr.
Temperature Units	C/F	Displays Temperature in Centigrade or Fahrenheit.
Inert Gas Blanket		Future development not yet implemented
Inert Gas Purge		Future development not yet implemented
Change IGP Password		Future development not yet implemented

Maintenance

Select ***Maintenance*** from the ***Method Select*** menu.





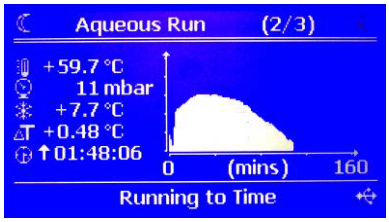
Options and information

Next Log Filename	Next Log File number for allocation
System Hours	Total of hours system operation
Pump Hours	Total hours of pump operation
Motor Hours	Total hours of motor operation
Heater Hours	Total hours of heater operation
Condenser Hours	Future development not yet implemented
Most Recent Error	Displays up to 10 errors
Water Valve	Open / close coolant water valve (running cold water powered condenser option only)

View Last Method Graph

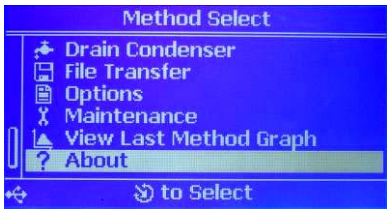
Select ***View Last Method Graph*** from the ***Method Select*** menu.

The screen displays the graph (ΔT against time) for the last completed method.



About

Select ***About*** from the ***Method Select*** menu.



Information

Product	Rocket
Model	Chemi
Serial Number	Serial number of individu instrument
Software Version PCB076 PCB077 Update Manager USB firmware	Version numbers of currently loaded software
Copyright ©	For information
Contact details:	For information

Software

USB data key

Upgrading

Contact your local Genevac representative for information on software upgrades. Upgrades can be sent by email and downloaded to a USB datakey for transfer to an evaporator.

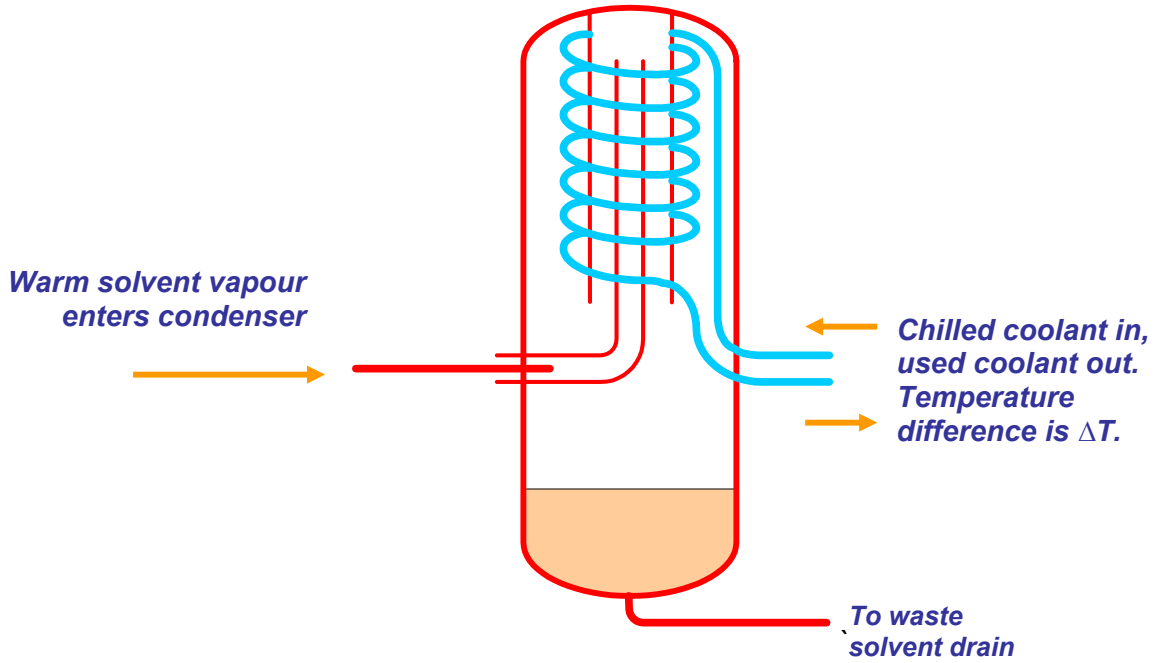
To upload software:

1. Create root folder entitled ***Rocket*** on a USB data key.
2. Download software upgrades to the USB data key ***Rocket*** root file.
3. Switch off the evaporator.
4. Insert the datakey into the USB socket located beneath the left hand side of the Evaporator control panel.
5. Switch the evaporator on. The system searches for and validates available software upgrades. Press start to install the upgrade, or stop to cancel.

   Note: The new software uploads automatically if the system software is corrupted.
6. Remove the datakey.

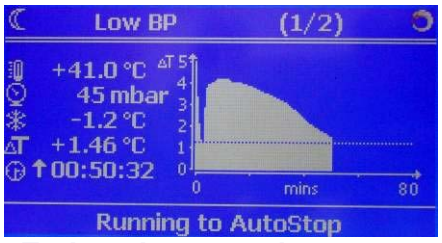
Delta T

The system monitors the temperature of coolant as it enters the condenser, and compares the temperature of coolant leaving the condenser. The resulting difference (ΔT) equates to the heat energy transferred by the condenser, and is proportional to the flow rate of warm solvent vapour entering the condenser.



External effects cause uneven warming of the coolant hoses during standby which can affect ΔT stability during the early stage of evaporation. For this reason, the system does not attempt to set the end of stage trigger point during the first five minutes of operation.

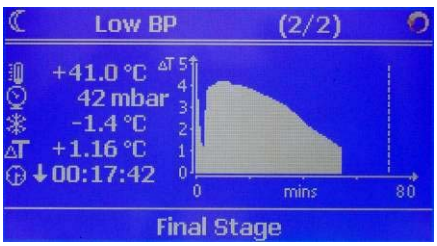
Once stabilised, ΔT peaks at the point where solvent evaporation is most rapid. The system sets an end of stage trigger point at a percentage value of the ΔT peak (the percentage value being defined within the method). The menu screen shows the end of stage trigger point as a horizontal dotted line and displays ***Running to AutoStop***.



ΔT trip point set and evaporator running to AutoStop

When the ΔT end of stage trigger point is reached, the evaporator proceeds to the next stage; this may be a new stage (in a multi stage method) or it may be the final drying stage.

Once in the final drying stage, the menu screen shows a vertical dashed line at the projected end of run time, and displays *Final Stage*. The system runs to the time determined by the method.



Final drying stage, evaporator running to time

Strobe

Sample Viewing Window

Strobe Control

The strobe may be used for viewing samples whilst the evaporator is operating. The strobe does not function during spin up, spin down or when the rotor is stationary.

The strobe is a build option and may not be available on all evaporators.

Warning: The strobe frequency range is 5 to 30Hz. Take care when using the strobe as persons in the vicinity may suffer adverse effects from flashing strobe light.

1. Press the strobe control. A warning message appears on the menu screen. Press the control a second time to activate the strobe. The display reverts back to the Method Running screen if no user intervention occurs within 5 seconds.
2. An icon appears on the screen whilst the strobe is active. See ***Method Running Display*** for details.
3. View samples through the sample viewing window.
4. Turn the strobe control to adjust the strobe timing. Each sample flask can be brought into view in turn.

   Note: Rotor positions are numbered to enable identification of individual samples.
5. Press the strobe control to switch the strobe off. The strobe powers off automatically after 2 minutes with no user intervention.

Sample Flasks

A variety of sample flask systems are available for use with the Genevac Rocket Evaporation System.

Standard Flask

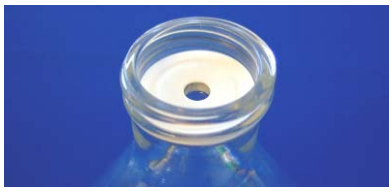
The ***standard flask*** is designed for general sample drying. The dried product may be re-suspended after evaporation, or scraped from the "nose" of the flask.

Standard Flask

SampleGenie™ Vial System

The ***SampleGenie Vial System*** is designed for drying samples directly into vials.

1. Insert a ***vial seal*** into the neck of a flask, chamfer side down. Push it down until the seal locates against the glass shoulder.



Note: Standard ***SampleGenie vial seals*** are manufactured from low leachable viton. Perfluoroelastomer seals are also available.

2. Place a ***flask collar***, with ***collar pad*** inserted, over the neck of the flask

3. Place a vial into a ***vial adapter***.

4. Screw an assembled flask, flask collar and collar pad onto the vial adapter.

Caution: Never place a flask, vial and vial adapter assembly into the rotor without a flask collar / collar pad assembly.

5. Repeat steps 1 to 4 for the remaining sample flasks.

6. Place the flask assemblies into the flask holder to fill them with samples.

Note: Inspect the collar pads periodically and replace them if necessary. To replace the collar pad: remove the flask collar from the flask and discard the defective collar pad. Fold the new collar pad and insert it into the flask collar. The collar pad unfolds into the correct position when released.

SampleGenie™ GC Vial System

The ***GC Vial System*** is used to concentrate samples into vials. Its design minimises heat transfer into the vial, the evaporator detects a slowing of evaporation when the solvent level drops below the neck of the flask and stops the evaporation process with a finite volume of solvent remaining.

GC Vial Adapter

1. Insert a ***vial seal*** into the neck of a flask.

2. Push down until the seal locates against the glass shoulder .

Note: The standard ***SampleGenie GC vial seals*** are manufactured from low leachable viton, perfluoroelastomer seals are also available.

3. Place a vial into a ***vial holder***.

4. Place the assembled vial and vial holder into a ***flask cap.***

5. Screw a flask onto the vial / cap assembly. Take care to ensure the vial aligns centrally with the vial seal.

6. Repeat the procedure for all other sample flasks and place the flask assemblies into the flask holder in preparation for filling with samples.

Note: The SampleGenie GC Vial System is designed to accommodate Crimp Top GC vials. Contact your local distributer or Genevac Ltd for advice on the compatibility of alternative vials.

Caution: Remove the flasks from the evaporator carefully. They are likely to be hot and wet.

Place the flasks in the flask holder to fill with samples.

Seal the flasks using a Flask Splash Cap before transporting the flasks in the flask holder.
Do not mark or apply labels to the sample flasks around or below the level where the rotor flask seal locates into the rotor. Do not fill flasks above the maximum fill level indicated on the side of the flasks.

Caution: Ensure that the flasks are clean and undamaged before every use. Scratched or damaged flasks may break resulting in unrecoverable sample loss and possible damage to the evaporator.

Replacement or spare flask sets are available. Contact your local Genevac agent for details.

Error Messages and Fault Finding

If an error occurs whilst the evaporator is operating, the system notifies the operator by flashing the blue condenser illumination and showing a flashing error icon  on the screen. Errors which are safety critical, cause the evaporator to stop. Non critical errors will be flagged but allow the evaporator to continue. When the display states ***Rotate to View***, non critical errors are revealed by turning the Menu Control.

Warning or advice information may also appear on the screen. In all cases, error messages and error codes are displayed on the screen after the evaporator stops. The following table lists common error messages and the action recommended for rectifying the problem.

Er Code	Cause of Error	Rectification
01-04	Electronic failure	No user action possible, contact Genevac Service
05-07	Lid safety errors	Ensure lid is closed and engaged with latch
08	Fail to detect lid open	Avoid stop / start without opening lid
13	Fail vacuum start up test	Check inner chamber lid, flasks / blanking plugs are fitted
14	Rotor not spinning	Check / remove debris from chamber
15	Spin speed too low	Check / remove debris from chamber
17-20	Out of balance (critical)	Rebalance rotor
21	Out of balance (warning)	Rebalance rotor
24-29	Vacuum integrity failure	Check flask seals, run ***System test***
32	Condenser too cold for aqueous	Reset condenser coolant temperature to >+2°C
50	Unexpected spin	Avoid excessive turning of rotor whilst loading
57	Condenser temperature too low	Reset re-circulating cooler supply temperature
59-60	Supply voltage out of range	Check mains supply voltage
61-65	Data transfer error	Check data key route folder
74-77	System Test – Leak detected	Check seals as directed by accompanying text
78	Re-circulating coolant level low – only if comms lead connected	Check / top up re-circulating cooler reservoir

Once the cause of an error has been established and rectified, press and hold the stop key  for 5 seconds to clear the error. Non-critical errors will self clear automatically.

Contact your distributer or Genevac Service for advice if errors occur which are not listed above, or if reduced system performance is experienced. Be prepared to provide the following information:

- System type, model and serial number
- Details of application (method settings, solvent, volume, flask / vial type etc)
- Detailed description of problem
- Download and send ***System Info*** via email.
- Download and send the log file from a completed ***System test*** method via email (this assists Genevac Service to analyse system performance issues)

A log of the last ten errors, encountered by the evaporator, can be viewed via the ***Options*** Menu. Alternatively, an error log is included in the ***System Info*** which can be downloaded via the ***File Transfer*** menu.

The following table lists some possible fault symptoms and appropriate corrective actions.

Symptom	Cause	Corrective Action
Lid difficult to open	Dirty / contaminated outer lid seal	Clean the outer lid sealing face, clean or replace the outer lid seal.
Excessive vibration / noise	Rotor imbalance	Rebalance samples.
No Vacuum	Pump not running	Check power connection inside pump bay.
Excessive evaporation times	Poor vacuum	Run the System test. Contact local representative or Genevac service department for advice if the test produces an error code.
	Poor condenser performance	1. Check re-circulating cooler is turned on / temperature setting 2. Check water supply pressure / temperature .
Excessive evaporation times, method runs to time, not to AutoStop	Very low condenser solvent loading. ΔT too low to set AutoStop trip point	Add more solvent / samples
Excessive solvent odour	Method does not include ***Reduce Odour*** stage	Enable ***Reduce Odour*** via Method Edit screen.

Contact you local Genevac representative for details and availability of spare parts.

Routine Maintenance

Perform the following maintenance procedures to prolong the serviceable life of components and maintain optimum performance levels from the evaporator.

Check before Use

- All flasks are clean and undamaged. Do not apply labels or other markings to flasks around or below the level where they contact the Flask Seals
- All coolant hose connections are secure
- Waste solvent drain hose and vessel are secure and allow unimpeded drainage
- Exhaust hose is secure and allows unimpeded exhaust flow
- Correct water level in vacuum chamber reservoir, top up as necessary.

Caution: Scratched or damaged flasks may break causing unrecoverable sample loss and possible damage to the evaporator.

After Each Use

Wipe moisture or condensed solvent from the following parts using clean paper towel. Ethanol or methanol may be applied to a paper towel for use as a cleaning solvent.

- Inner lid sealing O-ring
- Outer lid seal
- Rotor flask seals
- Underside of chamber (sample viewing) window
- Inner lid
- Inside of outer lid.

Periodic Maintenance

Inspect the following parts weekly (or in compliance with local in-house risk assessment) and clean or replace defective parts as necessary:

- Sample viewing window, clean / replace if necessary
- Outer lid seal
- Inner lid sealing O-ring
- Flask seals, replace as a set if necessary
- Adapter cushions, replace as a set if necessary.

Remove and replenish the chamber reservoir water to prevent algal growth. Reservoir water may be removed using a pipette, or by soaking up with paper towel.

Recommended Practice

Caution: Clean up any solvent or sample spills immediately.

Exterior paintwork may be cleaned using a detergent solution. Alternatively use ethanol or methanol applied to a soft, lint free cloth or paper towel.

Warning: The lid and inner lid will heat up to sample control temperature during operation. They may be hot to touch during or after evaporator operation.

Leave the outer chamber lid in the open position when the evaporator is not in use. Switch off the evaporator (and, if applicable, the re-circulating cooler) whenever the system is unused for a prolonged period. Only load samples when ready to start the evaporation.

Caution: Do not leave flasks containing solvent in the evaporator when not in use.

Caution: Exposure of the seals to vapours from ketone solvents (such as acetone) may cause swelling. Should the flask seals suffer damage due to swelling or become unserviceable due to wear and tear, refer to: ***Flask Seal Replacement*** for details of how to replace these parts.

Repair and Maintenance

Flask Seal Renewal

The flask seals are consumable parts and may suffer damage due to wear and tear in normal use. If a flask seal is damaged it must be replaced. Flask seals should normally be replaced as a complete set.

Removal

1. Remove all sample flasks from the rotor.
2. Lift a seal clamp and remove its assosiated clamping ring.

3. Pull the flask seal away from the basket.

Refitting

4. Place the new flask seal in position and press the seal into the slot in the basket

Start at one point, move to the point at 180° (oppoite) then the points at 90° and 270°. Then work around the seal untill the seal lip is flush with the basket all the way round.

Note: Use soapy water to lubricate the seal if it is difficult to insert.

5. Replace the clamping ring and lower the seal clamp.
7. Repeat this procedure for the remaining rotor positions.

Test the vacuum system: insert blanking plugs or empty standard flasks into all rotor positions. Select ***System test*** from the ***Method Select*** menu and allow the maintenance self test to complete.

Vacuum Pump Removal / Refitting

In the unlikely event of a vacuum pump failure, an exchange replacement pump may be acquired.

No attemp should be made to dismantle or repair the defective pump other than by trained representatives of Genevac. Contact your local Genevac representative for details.

Follow these instructions to remove and replace the vacuum pump assembly.

1. Switch off power and isolate evaporator from mains supply.
2. Release 3x fasteners and open the evaporator side access panel.
3. Disconnect the fan power cable and remove the side panel.

4. Remove the pump tray retaining screw and pull out the pump tray assembly as far as the PTFE hoses will allow.

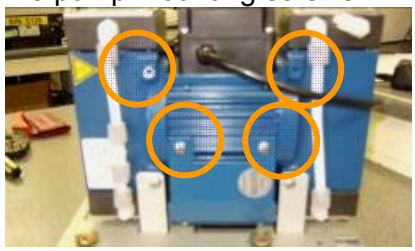
5. Disconnect the plastic hose connector to release the top left PTFE hose. Pull the pump tray out further.

6. Disconnect the plastic hose connector to release the back left PTFE hose from the “T” connector .

7. Pull the pump tray all the way out and position the pump assembly to one side.
8. Disconnect the pump power cable from the power socket inside the pump bay .

9. Remove 2x M6 pump mounting screws

10. Turn the pump around and remove 2x M5 pump mounting screws.



11. Lift the vacuum pump away from the pump tray

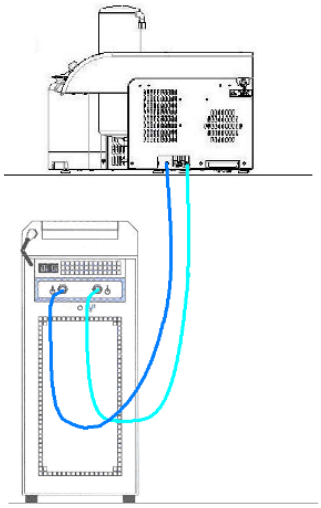
Reverse the procedure to fiit the replacement vacuum pump.

Take care to avoid cross threading or over tightening the plastic hose connectors when reconnecting the PTFE hoses. The plastic Hose connectors should be no more than finger tight

Condenser Coolant – Draining

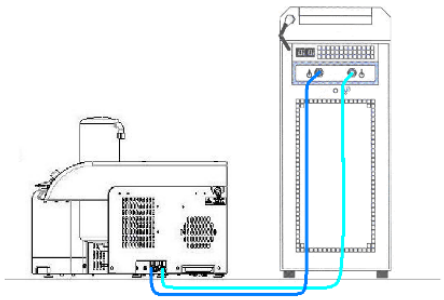
Follow procedure **A**, **B** or **C** according to which option most closely matches the system set-up.

A Evaporator located on a bench, re-circulating cooler located on the floor:



1. Switch off the re-circulating cooler.
2. Place some paper towel beneath the evaporator coolant-hose connectors (a small amount of coolant may dribble from the connectors during the following steps).
3. Use a 19mm spanner to loosen the evaporator ***coolant in*** hose connector.
4. Hold the hose tightly in position to minimise water leakage whilst continuing to disconnect the ***coolant in*** hose connector by hand.
5. Remove the water hose from the evaporator and hold it up so the coolant drains back into the re-circulating cooler reservoir.
6. Loosen and remove the ***coolant out*** hose from the evaporator in the same way. The remaining coolant will drain back into re-circulating cooler reservoir.
7. The coolant hoses can now be disconnected from the re-circulating cooler if required.

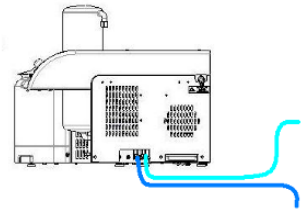
B Evaporator and re-circulating cooler located on a bench:



1. Switch off the re-circulating cooler.
2. Loosen one of the hose connectors to the re-circulating cooler.
3. Hold a suitable container beneath the loose coolant hose connector and disconnect the hose.
4. Keeping the container beneath the disconnected hose end, lower the hose and container to floor level. Coolant begins to drain from the condenser and re-circulating cooler into the container.
5. Repeat this procedure for the other coolant hose.
6. Use 19mm spanner to disconnect the coolant hoses from evaporator if required.

Retain the coolant collected in the container and tip back into the re-circulating cooler reservoir, see the cooler Operating Manual for details.

C No water cooler, running cold water supplied from a tap.



1. Switch off the evaporator.
2. Turn off the water supply.
3. Disconnect the water hose from the supply tap.
4. Hold the disconnected hose end at a height above the evaporator during the next step.
5. Use the menu navigation control. Enter the ***Maintenance*** menu and select water valve*. The water valve will open allowing coolant water to drain from the condenser.

Note: Evaporator build variants specified for use with running cold water supply have a water valve fitted in the cooling circuit. The water valve elliminates water wastage when the evaporator is not running.

Should an evaporator with a water valve be installed with a re-circulating cooler (due to change of use or upgrade) switch on evaporator and insert procedure C, step 4 after procedure A, step 5 or procedure B, step 4.

Condenser Removal / Refitting

Routine removal of the condenser should not be necessary. Follow these instructions, to remove the condenser, only if the glass is damaged.

Warning: Wear appropriate personal protective equipment, including anti puncture and solvent proof safety gloves

1. Drain all waste solvent from the condenser. See ***Draining the Condenser*** for details.

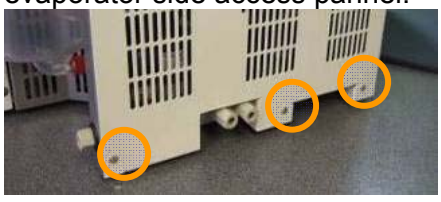
2. Drain the coolant from the condenser. Refer to ***Draining Condenser coolant*** for details.

3. Switch off the evaporator and isolate from the mains power supply.

4. Unscrew the GL18 connector to disconnect the PTFE hose from the bottom condenser fitting.

5. Unscrew the GL18 connector to disconnect the PTFE hose from the top condenser fitting.

6. Release 3x fasteners and open the evaporator side access pannel.



7. Disconnect the fan power cable and remove the side panel.

8. Disconnect 1x GL32 and 2x GL18 connectors to release the tubing from back of the condenser.

9. Lift and wiggle the glass condenser assembly upwards until clear of the evaporator. Place the glass condenser assembly on a suitable work surface.

Inspect the glass condenser assemblty to ensure it is free from cracks, nicks and other damage. A replacement condenser glass is available as a spare part.

The glass condenser assembly may be cleaned using water, methanol or other suitable cleaning solvents.

Re-install the condenser assembly by following the above procedure in reverse. Begin by lifting the top GL18 connector into position. (the connector will probably have slid down the PTFE tube as the condenser assembly was lifted clear of the evaporator). Hold the GL18 connector in position whilst lowering the condenser assembly into the evaporator.

Test the vacuum system: insert blanking plugs or empty standard flasks into all rotor positions. Select ***System test*** from the ***Method Select*** menu and allow the maintenance self test to complete.

Rotor Removal / Refitting

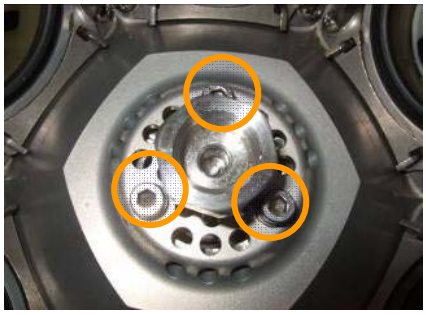
Follow this procedure if removal of the rotor is required for routine cleaning purposes.

1. Open the main lid.
2. Switch off the evaporator and isolate from the mains power supply.
3. Romove the inner lid.
4. Remove all sample flasks and / or blanking plugs. Store the flasks safely.
5. Lift a seal clamp and remove the associated clamping ring and flask seal. Repeat for all other rotor positions.

6. Use a flat tool such as a spatula to release the flask adaptor locking tab .

7. Remove the flask adapter from its basket .

8. Repeat the procedure to remove the flask adaptors from all remaining rotor positions.
9. Remove the 3x rotor screws using a 4mm allen key.



10. Lift the rotor assembly free it from the shaft and away from the evaporator.
11. Place the rotor assembly on a suiatble flat work surface.

12. Revove the rotor shaft O ring.

13. Remove the inner lid sealing O ring.

The rotor assembly and main vacuum chamber are now accessible for cleaning. A stiff brush may be used with water, methaol or other suitable cleaning solvents.

Refit the rotor by following this procedure in reverse. Check the flask seals are correctly seated once the rotor is refitted.

Note: Locate the adapter into the basket in the correct orientation. The flask adapter locking tab must locate into the central lower slot of its basket.

Caution: Failure to ensure correct orientation of the adapter is likely to result in flask breakage, unrecoverable sample loss and damage to the evaporator.

Flask Adapter Cushion Renewal

The flask adapter cushions must be replaced if they become damaged.

1. Open the outer lid.
2. Switch off the evaporator and isolate from the mains power supply.
3. Remove the inner lid by unscrewing the inner lid thumb screw and lifting the inner lid away from the rotor. Store the inner lid safely.
4. Remove all sample flasks and / or blanking plugs. Store the flasks safely.
5. Lift a seal clamp and remove the associated clamping ring and flask seal. Repeat for all other rotor positions.

6. Use a flat tool such as a spatula to release the flask adaptor locking tab.

7. Remove the flask adapter from its basket.
8. Remove the flask adapter cushion from the adapter.

9. Insert one end of the new flask adapter cushion through the retaining loop in the flask adapter.

10. Use a scredriver or similar tool to push the cushion over the retaining clip.

11. Repeat for the other end of the flask cushion. Ensure the cushion is correctly seated in the flask adapter.

12. Refit the flask adapter into the rotor ensuring that the flask adapter locking tab is located into the cenrtral lower slot of the rotor basket.
13. Refit the clamping ring.

Caution: Failure to ensure correct orientation of the adapter is likely to result in flask breakage, unrecoverable sample loss and damage to the evaporator.

Sample Viewing Window Removal / Cleaning

The sample viewing window assembly consists of two main parts:

Cladding Window and Seal

Prevents dust or solvent spillage from entering the evaporator outer cladding.

Chamber window

Provides vacuum sealing of the outer chamber. The chamber window is heated on evaporator build variants that are fitted with a strobe.

Caution: Take care when cleaning the heated chamber window. The heating element is fragile and may be hot if the evaporator has been running recently. Switch off the evaporator and isolate from the mains power supply. Wait for the heating element to cool before continuing.

1. Open the outer lid and wipe the underside of the chamber window. Use a clean, non abrasive paper towel or lint free cloth.

2. Press in the lower edge of the cladding window, the top pops out and the window is released from the cladding aperture.

3. Remove the cladding window and wipe clean using non abrasive paper towel or lint free cloth.

4. The upper side of the chamber window is now accessible for cleaning . Take care to avoid damaging the window heating element (if fitted).

5. Press the cladding window back into the cladding aperture.

Critical Failure Recovery

The following notes may be usefull in the event of power outage or a critical system failure

Warning: Carry out a risk assesment before performing any unplanned maintenance. Always observe Good Lab Pactice and work within the appropriate Health and Safety regulations.

Opening Lid without Power

1. Ensure the rotor is stationary and the vacuum system is vented to atmospheric pressure.

Note: In the event of power failure, the vacuum system vents automatically; the rotor may take up to 2 minutes to stop spinning.

2. Insert a narrow tool into the hole near the lid latch mechanism and release the lock by pushing the latch.

3. Lift the lid.

Recovering Broken Glassware

In the unlikely event of a glassware breakage, it is necessary to remove all traces of glass and solvent from the rotor assembly and vacuum chamber. Remove the rotor assembly to allow access.

Warning: Wear appropriate personal protective equipment, including anti-puncture and solvent proof safety gloves. Inspect all parts of the rotor and vacuum chamber for glass fragments before placing hands on or near any part of the evaporator. Pay particular attention to parts of the rotor and vacuum chamber that are not normally visible, the use of an inspection mirror, inspection lamp and magnifying glass is recommended. Follow the instructions for ***Removing / Replacing the Rotor***.

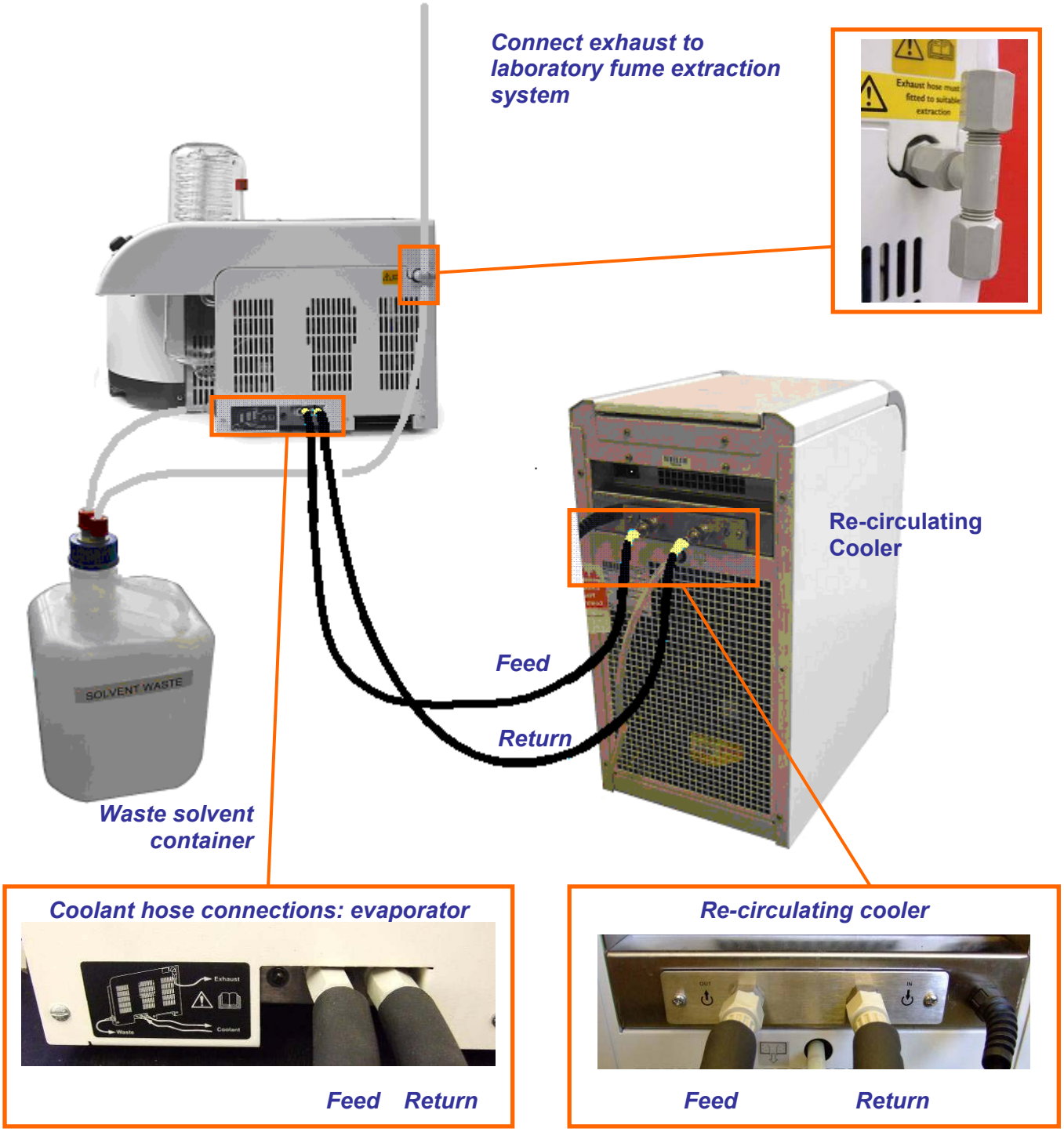
Installation

Overview

The illustration shows hose connections for an installation with a re-circulating cooler. The feed and return hoses may alternatively, be connected to a running cold water supply and drain.

Install the system according to the step by step instructions on the following pages

Caution: Check the evaporator serial plate before connecting mains power. Ensure the specified voltage is correct for the installation, refer to the section entitled: ***Model / Serial Number*** for details.



Evaporator

Place the evaporator on a level and sturdy work surface. Leave space for:

- A 75mm air gap between the evaporator side-panel cooling-vents and any other object
- A hose from the system exhaust to an appropriate laboratory fume extraction system
- Connection of the mains cable / cables to an appropriate mains power supply outlet
- Hoses to and from the re-circulating cooler, or cold water supply and drain.

Lift the evaporator into place using the four lifting points in the base.

Re-Circulating Cooler

Place the re-circulating cooler within two meters of the evaporator. It may be positioned on the floor, or on a suitably sturdy bench. Refer to the re-circulating cooler Operating Manual for installation instructions.

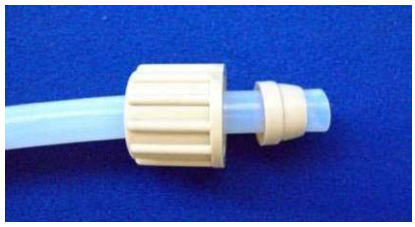
Ensure that all system components are suitably located for maintenance access and for general operational requirements. During the next stage of installation, hoses will be cut to length. After this it may not be possible to alter the location of some parts of the system.

Waste Solvent Container

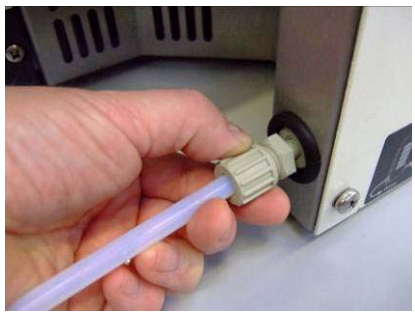
Place the waste container in a convenient location (normally on the floor, in front of the evaporator). It must be located so that solvent can drain freely, and to allow convenient access for emptying. There must be no sharp bends or upward incline of the hose between the evaporator and the waste solvent container.

Drain and Exhaust Hoses

1. Slide a finger nut and olive over one end of an 8mm opaque PTFE hose. This will be the waste solvent drain hose.



2. Connect the waste solvent drain hose to the waste solvent drain connector. Hold the hose against the solvent drain connector and screw the compression nut onto the spigot until finger tight.

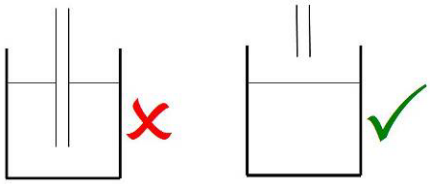


3. Cut the waste solvent drain hose to a suitable length so it may be connected to the waste solvent container.

4. Slide a finger nut and compression ring over the free end of the waste solvent drain hose.

5. Connect the waste solvent drain hose to the waste solvent container. Hold the waste solvent drain hose against the waste solvent container connector.

Caution: Position the waste solvent drain hose so that the end of the hose cannot be submerged below the level of the waste solvent . Screw the finger nut onto the connector spigot until finger tight.



6. Using the same method, connect another section of 8mm opaque PTFE hose to the second connector of the waste solvent container. This will become the waste solvent container breather hose.

7. Cut the waste solvent container breather hose to a suitable length and connect it to the evaporator exhaust T piece

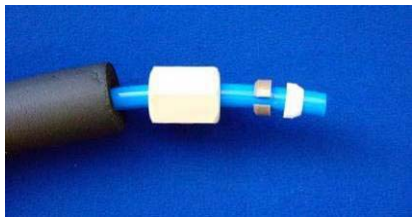
8. Connect the remaining 8mm opaque PTFE hose to the remaining spigot of the evaporator exhaust T piece. This will become the evaporator exhaust hose.

9. Cut the exhaust hose to a suitable length and connect it to the laboratory fume extraction system.

Re-Circulating Cooler Hose Connections

1. Remove the transit sealing bungs from the evaporator coolant connectors (located below the right hand side cover panel).

2. Place a compression nut, split ring and olive over one end of a coolant hose.



3. Connect the coolant hose to the evaporator ***coolant in*** connector. Hold the coolant hose against the connector and screw the compression nut onto the connector until finger tight. Tighten the compression nut (If necessary) no more than a quarter of a turn using a 19mm spanner.

4. Screw a hose adaptor onto the re-circulating cooler ***feed*** (or ***out)*** connector.

5. Slide a finger nut and olive onto the other end of the coolant hose.

6. Connect the coolant hose to re-circulating cooler ***feed*** adapter. Hold the coolant hose against the adapter and screw the finger nut onto the adapter until finger tight.

7. Repeat this procedure to connect the second coolant hose from the evaporator ***coolant out*** connector to the re-circulating cooler ***return*** (or ***in***) connector.

Re-Circulating Coolant

Fill the re-circulating cooler reservoir with a mixture of 50% water and 50% mono ethylene glycol. Refer to re-circulating cooler Operating Manual for instructions.

Note: If the cooling system fails to prime, open the re-circulating cooler reservoir filler, disconnect the coolant hose from the evaporator ***coolant in*** connector and hold the end of the hose over the re-circulating cooler reservoir filler. Allow water to flow into the coolant hose, reconnect the hose to the evaporator and prime the system again.

Re-Circulating Cooler Comms lead Connection

1. Connect the female end of the comms lead to the evaporator socket located under the right hand side of the evaporator control panel.

2. Connect the male end of the comms lead to the re-circulating cooler socket located under the re-circulating cooler control panel.

3. Set the re-circulating cooler ***remote control activate*** mode to: ***On***. Refer to re-circulating cooler Operating Manual for details.

If glycol is unavailable, 100% water may be used as a temporary measure. In this case omit step 12 and proceed as follows.

- Fill the re-circulating cooler reservoir with water
- Set the re-circulating cooler ***remote control activate*** mode to: ***Off***. See the re-circulating cooler Operating Manual for details
- Set the re-circulating cooler coolant supply temperature to +5°C

The evaporator performance is restricted.

Note: For installations where more than one evaporator is connected to a single re-circulating cooler, switch the ***remote control active*** mode to ***Off*** and set the required coolant supply temperature manually. Contact Genevac for further advice.

Cold Water Connection

Note: Ensure the cold water supply conforms to requirements for temperature, pressure and flow rate. The Installation must also comply with local regulations regarding connection of equipment to a water supply.

Remove the transit sealing bungs from the evaporator coolant connectors (connectors are located below the right hand side cover panel).

Connect a suitable water hose ($^3/_8$" internal diameter) to the evaporator ***coolant in*** spigot.

Connect the other end of the water hose to the running cold water supply. The use of a non return valve is recommended to avoid the possibility of contaminating the water supply. Due to the variation of water supply outlets, Genevac do not supply this valve.

Connect a suitable hose ($^3/_8$" internal diameter) to the evaporator ***coolant out*** spigot. Connect the other end to the water drain.

Turn on the cold water supply.

Note: Coolant water will not flow until the evaporator is switched on and a run is commenced.

Connect the mains power cable to the Evaporator and switch on the power.

Mains Power Connection

Connect mains power to the Evaporator and re-circulating cooler using the power cables supplied. Switch on the power.

Power Switches

Commissioning instructions appear on the screen when the evaporator is switched on for the first time

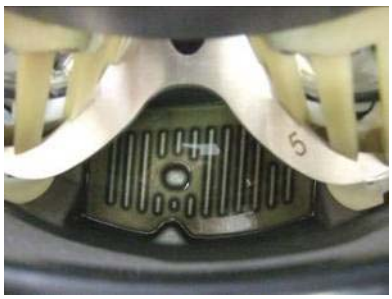
Press the Menu Control to confirm that each step of the commissioning instruction has been completed. The ***Commissioning*** screen offers the option to disable this feature upon completion or allow it to reappear at subsequent power ups.

Menu Control

Vacuum Chamber Water Reservoir

Fill the vacuum chamber water reservoir using 250ml of distilled water. Use deionised water only (resistivity 50,000 to 1 megohm at pH >6.5 and particulate free).

The evaporator is now ready for use. All instructions contained within the Rocket Evaporation System User Manual (and, where applicable, Re-circulating Cooler Operating Manual) should be read fully before using the system.



Technical Data

EC Declaration of Conformity

Rocket Evaporation System

Manufacturer's Name: *Genevac Ltd*

Manufacturer's Address: Farthing Road
Ipswich
Suffolk
IP1 5AP
UK

Type of Equipment: Laboratory Equipment

This is to certify that the following Rocket products:

RKCM-1005060-xxx
RKCM-12060-xxx
RKCM-22060-xxx
RKCM-23050-xxx

Serial Numbers from/to: Individual declarations are available on request

Conform to the Essential Health and Safety requirements of European Directives:

- Machinery Directive (98/37/EEC),
- EMC Directive (2004/108/EEC) and
- Low Voltage Directive (73/23/EEC) as amended

Conformity is demonstrated by compliance to the following standards:

- EN 60204-1: 2006 (Safety of machinery. Electrical equipment of machines. General requirements)
- BS EN 1088:1995+A1:2007 (Safety of machinery. Interlocking devices associated with guards. Principles for design and selection)
- IEC 61326: 2006 (Electrical equipment for measurement, control and laboratory use. EMC requirements)
- BS EN 61010-1: 2001 (Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements)

Note: The electrical supply must be protected by an appropriately rated type C or type D circuit breaker (or equivalent).

Signed: Position: Chief Electrical Engineer

Name: G. Broadbent Date: 1st October 2008

Being the person appointed on behalf of Genevac Ltd to sign on their behalf

Specifications

Mechanical

Max rotor speed	1,800rpm
Max sample acceleration	700G
Drive system	Direct
Max rotor imbalance	40g
Weight (dry) approx	75kg

Condenser

Type	Dual Glass Coil
Powered by	cold water / glycol mix
Maximum coolant pressure	7 bar (static)
Minimum flow rate	1 litre per minute
Maximum flow rate	2 litres per minute
Maximum coolant temp	15°C
Minimum coolant temp	-15°C (+5°C if solvent may Freeze)
Solvent Level detection	Visual

Vacuum System

Inner chamber pressure	3 -1000 mbar
Display resolution	0.1mbar
Outer chamber pressure	3 -1000 mbar
Display resolution	1mbar
Vacuum control	Solenoid valve
Dri-Pure	Yes
Ultimate system vacuum	3mbar
Vacuum chamber water	Deionised: resistivity 50,000 to 1 megohm at pH >6.5 and particulate free. 250ml.

Vacuum Pump

Type	4 head diaphragm
Maximum vacuum	2mbar

Power Supplies

120V (±10%)	60Hz	15A	USA
230V (±10%)	50Hz	13A	UK + Europe
220V (-5+15%)	60Hz	10A	Korea + Saudi Arabia
100V (±10%)	50Hz	15A	Japan
100V (±10%)	60Hz	15A	Japan

Power Consumption

		Max	Idle	Stand by
230V	50Hz	5A	0.3A	0.1A
120V	60Hz	10A	0.6A	0.2A
100V	50/60Hz	10A	0.6A	0.2A

Note: The instrument may momentarily draw current in excess of the quoted figures. To comply with BS EN 61010-1:2001, the electrical supply must be protected by a circuit breaker. Genevac recommend an appropriately rated type C or type D circuit breaker (or equivalent).

Operating Environment

Ambient operating temp	15°C to 30°C
Relative humidity	10 – 60% (non-condensing)
Altitude	Sea level to 1,600m

Storage / Transporting Environment

Ambient temperature	-10°C to 40°C
Relative humidity	10 - 80% non condensing
Altitude	Sea level to 12,000m

Emissions

Noise levels during normal operation: 55dBA at one meter from the evaporator.

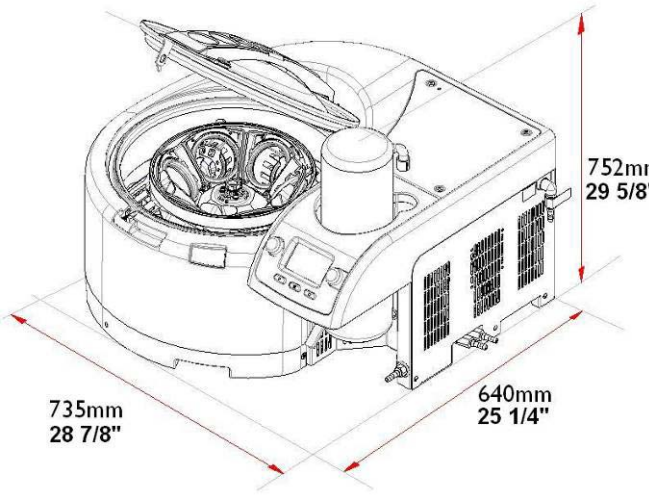
Electrical Earthing

This system must be earthed. This Evaporator is a Safety Class I product according to IEC classification. It must never be used with any interruption to the safety earth conductor. It is an installation category II product and is intended to operate from a normal single phase supply.

This Evaporator has been designed to be used in a pollution degree I environment (no pollution or only dry non-conductive pollution).

Height shown is with lid fully open. Extra allowance must be made for hoses and air venting.

Dimensions



Spare Parts and Service

Warranty Statement

This product (the Genevac Rocket Evaporator) is guaranteed for a period of 12 months from the date of delivery. In the unlikely event of a system failure arising from problems due to faulty materials or construction, the unit will be repaired (or user serviceable parts will be supplied) free of charge.

This warranty is subject to the following provisions:

- Any repair of this product shall be carried out by Genevac personnel (or approved representatives of Genevac) using only Genevac approved replacement parts
- The evaporator must be sited, installed and operated in accordance with instructions contained within this User Manual
- All vapours must be ducted away from the system as described in the installation instructions and User Manual
- The evaporator is used only for the purpose for which it was sold, and in accordance with the Genevac approved solvent list contained within this User Manual
- Preventative maintenance to be adhered to as detailed in “Maintenance and Cleaning” within this User Manual
- Consumable items (including Flask Seals) are not covered by warranty and should be replaced as and when necessary by the operator. Only Genevac approved parts to be used
- The vacuum pump may be exchanged for a refurbished unit in event of failure. The owner is responsible for the return of the failed unit
- Warranty does not cover accidental damage, misuse or damage caused by inappropriate repair by untrained personnel

Failure to adhere to the above may result in a charge for the cost of repairs.

The instrument is supplied in reusable packaging. This packaging should ideally be retained for reuse in the unlikely event that the equipment needs to be returned for repair. If the packaging is not retained, replacement packaging may be obtained from Genevac Ltd, however a charge may be made for the replacement packaging and any shipping costs incurred.

Returning Equipment to Genevac

Genevac does not accept the delivery of any equipment which is not accompanied by appropriately completed Safety Declaration paperwork. This applies to all equipment and / or parts.

Obtain the necessary Safety Declaration paperwork and details of Returns Authorisation procedures from your local Genevac representative or Genevac Service Department. Contact details are shown on the back cover of this User Manual.

Re-circulating Cooler Warranty and Service

If you have purchased a Julabo re-circulating cooler as part of your evaporation system, please read the Julabo Operating Manual fully and refer to it for details of warranty conditions. We draw your attention to the option to extend the product warranty period to two years.

Model / Serial Number

The model and serial number plate can be found below the condenser glass. Build variant information is encoded into the model number and may be interpreted as follows:

Model number: **RKCM-12060-SNW**

Rocket

N=Envi **CM**=Chemi
CP=Chemi Plus

Voltage and frequency

Water Valve: W= fitted N=not fitted

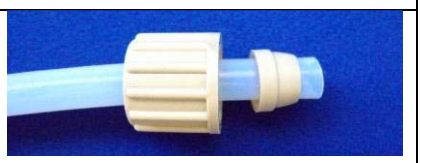
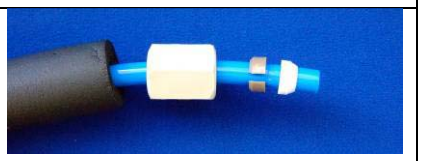
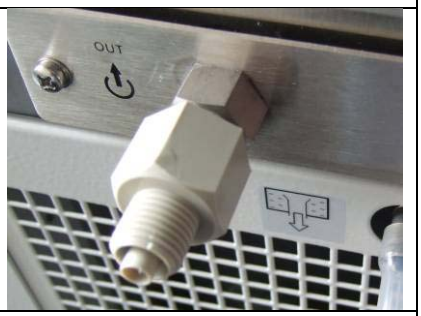
Inert Gas Purge: P=fitted N=not fitted

Strobe: S=fitted N=not fitted

Make a note of the model and serial number and quote this when contacting Genevac to request parts, servicing or repairs.

Spare Parts

Refer to the sections entitled: ***Safety*** and ***Maintenance*** before attempting to remove or replace these parts.

Part Number	Description	
04-5672/S	Replacement condenser glass assembly	
04-2705	Vacuum pump 230V	
04-2920	Vacuum pump 100V / 120V	
AB7006	Drain / Exhaust hose (specify length required when ordering)	
04-6435	Finger nut (waste solvent drain hose and coolat hose)	
04-6437	Olive (waste solvent drain hose and coolant hose)	
04-5786	Coolant hose	
07-0289	Hose insulation	
04-6430	Compression nut (coolant hose)	
04-6432	Split ring (coolant hose)	
04-6431	Olive (coolant hose)	
04-5917	Adapter (Julabo re-circulating cooler water hose)	
04-6274	O-ring (inside adapter)	
04-6339	Comms lead (evaporator to Julabo re-circulating cooler	
04-5676	O-ring (rotor shaft)	

Consumable Parts

The following consumable parts are not covered by the warranty. These parts are available and are user serviceable.

Part Number	Description
70-1193	SampleGenie vial system (complete) with white viton seal
70-1194	SampleGenie vial system (complete) with perfluoroelestomer seal
04-5838	Standard flask
04-6310	SampleGenie vial system - flask (glass 250ml)
04-6311	SampleGenie vial system – vial seal (white viton)
04-6312	SampleGenie vial system- vial seal (perfluoroelastomer)
04-6340	SampleGenie vial system – flask collar and pad assembly
04-6342	SampleGenie vial system - flask collar
04-6341	SampleGenie vial system - collar pad
04-5650	SampleGenie GC vial system - flask (glass 250ml)
04-6234	SampleGenie GC vial system - seal (white viton)
04-6291	SampleGenie GC vial system - seal (perfluoroelastomer)
04-5892	SampleGenie GC vial system - vial adapter
04-5899	SampleGenie GC vial system - O-ring for vial adapter
04-5899	SampleGenie GC vial system - O-ring for vial adapter
04-5664	SampleGenie GC vial system - flask cap (GL25)
04-6372	Sample Flask Splash Cap
04-5865	Rotor - blanking plate
04-6071	Rotor - flask seal
04-5602	Rotor - inner lid seal (O-Ring 260IDx4 Viton)
04-6273	Rotor - flask adapter cushion
04-5818	Outer lid seal

Amendment Control Form

Revision Number	Issue and Reason for Change	Date Issued
1	Clarified instructions for downloading to USB datakey root file	6 October 08
1-2	Revised drawing Vacuum System Schematic	6 October 08
1-3	Corrected specified tollerance for 220V power supply	6 October 08
1-4	Insert Certificate of Conformity Expand System test Instructions to remove water	13 October 08
1-5	Add methanol to List of Acceptable Solvents	22 October 08
1-6	Update images and instructions for connecting hoses Update US address	29 October 08
1-7	Insert instruction to disregard ΔT anomalies while stabilising Update error table for error 74-77	29 October 08
1-8	Insert safety warning and instructions to avoid siphoning of waste solvent. Repeat electrical earthing warning in safety section (already in specifications). Insert instruction to check mains voltage before installation. Insert warning; flasks may be hot and wet.	7 November 08
1-9	Insert SamplGenie vial System	17 November 08
1-10	Remove SamplGenie non insulating adapter. Conventionalise SampleGenie terminologies. Update Hazzard symbol	9 December 08
1-11	Add *Save System Info* to Maintenance Menu, update image and instruction to reflect software change in Method Edit Menu	16 December 08
1-12	Add statement: electrical supply must be protected to comply with safety standards.	13 January 09
1-13	Change methanol to Low Boiling Point, add instruction for sample Flask Splash Cap.	10 February 09
1-14	Add Delta T section. Add Spare Parts List. Clarify installation instructions and illustrations. Add Menu Screens illustration. Restructure Contents. Reformat 2 column text and image sections. Add imperial dimension units. Update images and text to reflect V1.06 software changes.	6 April 09
1-15	Add re-circulating cooler warranty instructions, rename Flask Splash Caps, revise lid opening instructions	9 April 09

These instructions are correct at time of going to press and may be subject to change without notice.

These operating instructions should be read before you use the Genevac Rocket Evaporator.

Your attention is drawn in particular to the section entitled: ***Safety***

The evaporator should not be discarded in your regular disposal stream. Contact your Distributor or Genevac for proper disposal instructions.

Within the EU, it is Genevac's responsibility under the WEEE directive to provide for the recycling of their products.

Notes

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