KBIOSYSTEMS
porvair

Sample Concentrator

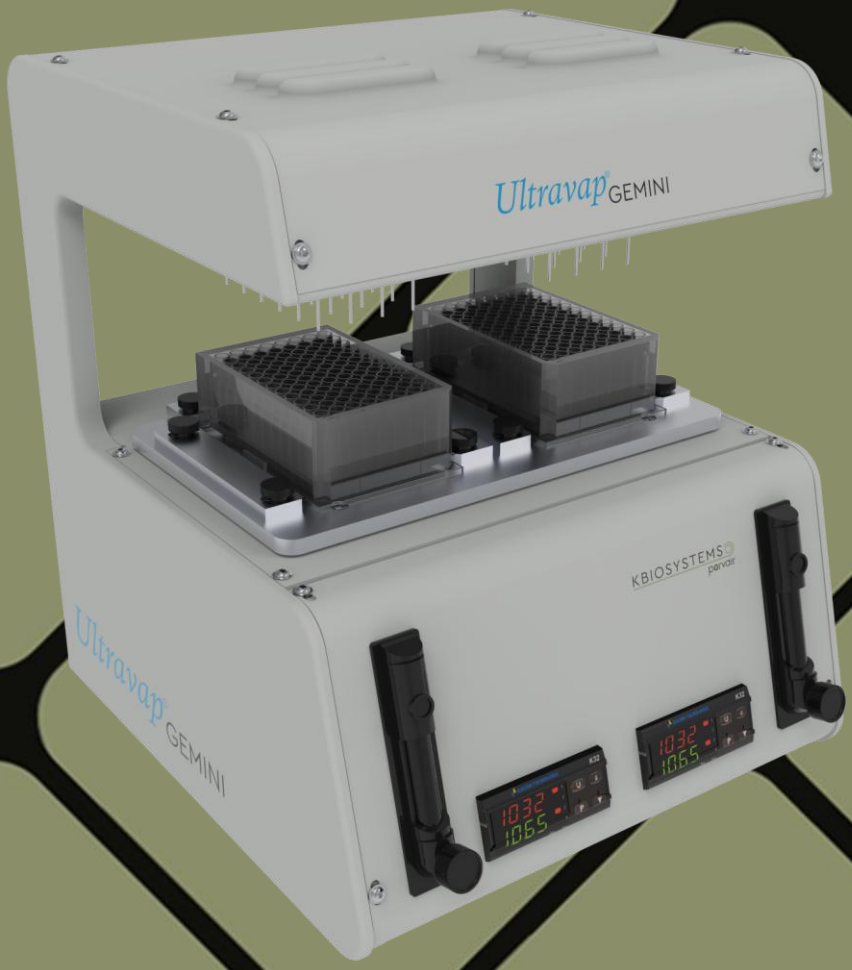
User Manual

KBF167-10051-000 Version 2.0-25

8090-10051-000

Ultravap GEMINI

Read these instructions thoroughly before using this product. keep these instructions in a safe place for future reference.



Document Information

Copyright

Publication and Purpose

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This document provides installation and operating instructions for the Ultravap GEMINI.

All possible care has been taken in the preparation of this user guide, but Kbiosystems Ltd., its agents and distributors accept no liability for any inaccuracies that may be found. This user guide reflects the state of the product at the publication date above, but further enhancements while in service may mean that the user guide does not precisely reflect your system.

Kbiosystems Ltd. reserves the right to make changes without notice both to this user guide and the products which it describes.

Symbols and Notices Used

Important information has been highlighted throughout this document using the following symbols:

Warning	See relevant section	Take note of this information
		

Important safety information in the safety section below has been highlighted using the following symbols:

Caution: Finger entrapment / injury	Caution: Injury / product damage	Warning: Electrical death / serious injury
		

Caution: Hot area / injury	Caution: Protective Conductor Terminal	Safety Instruction: Wear appropriate gloves
		

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Contents

1. Safety Information

Ensure that the information and instructions provided in this section have been reviewed prior to unpacking, installing or operating the product.

1.1 Intended Use

Kbiosystems Limited has introduced the compact, stand-alone blow down sample concentrator, to allow evaporation of solvents from microplates in minutes, rather than hours.

1.2 Statutory Obligations

Installation and maintenance must comply with all relevant local laws and regulations ('statutory obligations').

Statutory obligations always override manufacturer documentation.

It is the responsibility of the customer to conduct a Health & Safety risk assessment prior to installing and operating this product.

This product should not be operated by children or persons with reduced physical, sensory, or mental capabilities. Where necessary, such persons should be given supervision by a qualified person responsible for their safety.

Do not position the unit where it may violate Fire or Health and Safety regulations (e.g., block fire exits or stairwells, etc.).

1.3 Electrical Safety

Warning: Electrical Death / Serious Injury (Risk of 115 -230 Nominal Volt Alternating Current (VAC) Electric Shock)

Only qualified, competent, and approved persons may undertake installations, repairs, or relocations of this product.

Only approved, supplied mains cord set must be used with this instrument. If an extension lead is required, then it must be earthed correctly.

Ensure that the building electrical system is compliant with Safety Regulations.

For indoor use only in a well-ventilated area.

Do not allow children or any other unqualified or unapproved persons to install, repair, clean, relocate, or otherwise interfere or tamper with the product.

Do not immerse the unit or its peripherals in liquid.

Do not install outdoors, near explosive gases, hot works, or where there is a danger of freezing.

Do not connect to incompatible power sources or use any fuse other than that specified.

1.4 Installation Safety

Caution: Injury / Product Damage (Product Weighs at Least 14 Kilograms)

Use appropriate lifting and carrying equipment – including Personal Protective Equipment (PPE) – for installation and movement of the product.

Install on a suitable, stable bench with sufficient space to avoid the unit falling, vibrating during operation, or being unable to extend the plate carriage fully.

1.5 Operational Safety

Caution: Finger entrapment / Injury (Fingers May be Caught in the Plate Carrier)

When instrument is running, ensure that fingers or other appendages are clear from being caught.

Do not place fingers, other appendages, or any other items into openings not intended for them.

Safety: Wear Appropriate Gloves (Ensure Appropriate Gloves are Worn)

Chemically resistant gloves must be worn when handling samples.

Protective gloves must be worn when installing or moving the unit.

Do not attempt to touch chemicals, or other potentially hazardous substances without the use of appropriate gloves.

Supplement gloves with other appropriate PPE where necessary (e.g., eye protection, etc.).

Safety: Using Solvents and Potentially Hazardous Chemicals (Ensure Proper Training and Care is Taken When Handling/Disposing of Solvents or Chemicals)

Do not use with damaged or defective plates.

Use in a well-ventilated environment, use a fume hood if necessary.

Sample waste used in the process should be disposed of using approved waste disposal procedures.

Ensure gas supply is within pressure limits.

SAVE THESE INSTRUCTIONS

2. Overview

2.1 Ultravap GEMINI

The instrument eliminates the traditional “bottleneck” of solvent evaporation prior to analysis or reconstitution in buffer. It has been designed to be used with ANSI/SBS format well plates. All evaporator heads are easily interchangeable. The instrument will accommodate either 96 or 384 well plates.

The Ultravap Gemini flows heated gas (typically Nitrogen) into a plate’s wells and will accommodate both deep and shallow well plates. The location of the needle array is fixed. The platform containing the well plates can be manually elevated to suit well plate dimensions and to optimise dry-down of samples.

The concentrator has been configured to be simple to install, operate and maintain. Installation requires connection to a gas supply of nitrogen or clean dry air, and a suitable electrical supply. Safe operation is ensured as the CE/UKCA marked unit fits into fume cupboards.

- Benchtop evaporator
- Compressed air or nitrogen compatible
- Interchangeable needle head design
- 115 -230 nominal VAC power compatible
- Built in safety features
- Easy to clean and maintain

2.2 Parts Supplied

All items listed below are provided upon purchase. All may also be purchased separately from Kbiosystems.

Part No.	Part Name	Part Code	Quantity
1	Ultravap GEMINI	250-10051	1
2	Mains IEC Lead UK	5058-10020	1
3	Mains IEC Lead USA	5058-10031	1
4	Mains IEC Lead EU	5058-10032	1
5	10 Amp Fuse	5050-10323	1
6	User Guide	8090-10051-000	1

Table 1: Ultravap GEMINI Parts Supplied.

2.3 Technical Specifications

Item	Specification	Notes
Model	Ultravap GEMINI	See section above for part code
Dimensions	380 x 380x 390 mm	Width x Depth x Height in millimetres
Unit Weight	14.5 kg	
Gas Input	8mm Female Thread inlet	
Input Gas	Nitrogen / Compressed Air	Clean, dry supply
Gas Supply Pressure	4 to 7 Bar (58 to 100 PSI)	
Flow	200 L/min	
Power Supply	115 to 230 VAC 50/60 Hz	
Fuse Rating	10 AMP Anti-Surge (T10AH 250V)	
Protection	IP40	
Ambient Temperature	10 to 30˚C (50 to 104°F)	
Humidity Range	10-80%	Non-condensing
Max. gas flow temperature	60 ˚C	

Table 2: Ultravap GEMINI Technical Specifications

Gas Supply Information

A suitable clean, dry, regulated gas supply should be connected to the instrument using 6 mm tubing. Use of a filter / separator in addition to supply regulator is strongly recommended. Typical gases suitable for use with the Ultravap GEMINI are nitrogen and compressed air.

For samples that are easily oxidised it is strongly recommended that nitrogen is used. The gas can be supplied from cylinders/bottles, via in-house systems, local compressor (air) or from a gas generator (nitrogen).

3. Delivery, Installation, & Repacking

Ensure that the information and instructions provided in section **1. Safety Information** have been reviewed prior to unpacking, installing, or operating the product.

3.1 Delivery

The unit is supplied in a re-usable crate and a transit bracket (where applicable) that must be retained in case the unit requires return (e.g. for servicing).

Where unpacking the unit after delivery:

- Inspect the unit and its parts for any damage that may have occurred during shipping.
- Use appropriate Personal Protection Equipment (PPE) and tools to safely remove the unit from its crate. **Do not damage or discard the crate or packaging provided.**
- Ensure that all components listed in section **2.2 Parts Supplied** have been provided.
- Ensure that all packing foam and ties are removed from the unit and its components.
- Store the re-usable crate and foam in a safe place.

3.2 Installation

Do not move the unit whilst in use. Install the unit on stable bench to avoid vibration during operation. Allow space for the plate carriage to move outwards without obstruction.

Where installing or moving the unit to a suitable location:

- Place the unit on a suitable and stable bench to avoid the unit falling or vibrating during operation.
- Use appropriate Personal Protective Equipment (PPE) during lifting or carrying equipment to install or move the unit.
- Allow sufficient space for the plate carriage located at the front to move outwards without obstruction.
- A pneumatic supply must be available nearby in a suitable environment (see section **2.3 Technical Specifications**).

3.3 Repacking

The unit is a precision instrument and MUST be properly repackaged for shipping. A failure to do so may result in unit damage during transit.

Where repacking the unit for return (e.g., if damaged or for servicing by Kbiosystems):

- Repack the unit in the same re-usable crate, foam, and transit bracket (if applicable) provided upon its original delivery.
- Ensure the unit has been repacked in the same way it was originally delivered.
- Where the original packaging has been lost or damaged, contact Kbiosystems via the details provided (see section **7. Warranty**) above before shipping.
- Ensure that all relevant parts have been repackaged prior to sealing and shipping.

4. Configuration

Ensure that the information and instructions provided in section **1. Safety Information** have been reviewed prior to unpacking, installing, or operating the product.

4.1 Connecting the Gas and Power Supply

Connecting the Gas Supply

Connect gas supply using 8mm connector. If a different fitting is required; remove the existing push-fit adapter using two spanners (one to remove the fitting, the other to constrain rotation of the bulkhead fitting.)

Connecting the Power Supply:

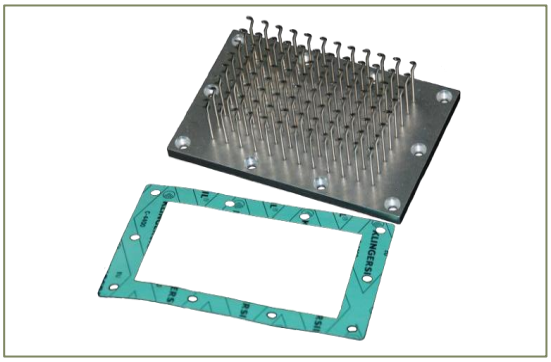
The Evaporator utilises a standard Euro inlet, which is fused and switched prior to inserting the connector. Check that the correct voltage is being applied.

4.2 Fitting and changing the needle head

It may be easier to carry out the following operations with the Evaporator laid on its side. Please ensure that a suitable soft cloth or tissue is placed on the surface to protect both it and the product if this is done.

To fit a Needle Head to the instrument, carry out the following steps:

- Disconnect from gas and electrical supplies, to minimise risk during the next steps



When fitting the Needle Head ensure to fit the manifold gasket supplied.

Note: It does not matter which way round the gasket goes.

- Carefully place Needle Head on top of the gasket and fix it in position using the socket head screws and Allen key (Hex wrench) provided. The screws should be placed in the centre holes at the front and back of the needle head.

- Tighten socket screws securely
- Reconnect gas and electrical supplies

To remove a needle head, typically for cleaning, repair or replacement, carry out the following steps:

- Allow instrument to cool, if it has been in use
- Disconnect from gas and electrical supplies, to minimise risk during the next steps
- Using Allen key (Hex wrench) supplied; remove the socket screws retaining the Needle Head. Retain the screws for re-fitting the head.
- Carefully remove the head – avoid bending or damaging needles
- Inspect gasket for tears and replace if required
- Fit new / cleaned head as instructed above

Thermal Cutout

Please note that the Ultravap Gemini is fitted with a thermal cut out switch. If the heater goes above a pre-set safe temperature, the thermal cut out will activate and the heater will be switched off.

If this occurs, please contact Kbiosystems immediately as it could indicate a fault.

5. Operation

Ensure that the information and instructions provided in section **1. Safety Information** have been reviewed prior to unpacking, installing, or operating the product. This includes secure placement of the unit on a suitable and stable workbench, as well as use of appropriate PPE.

5.1 Operating instructions

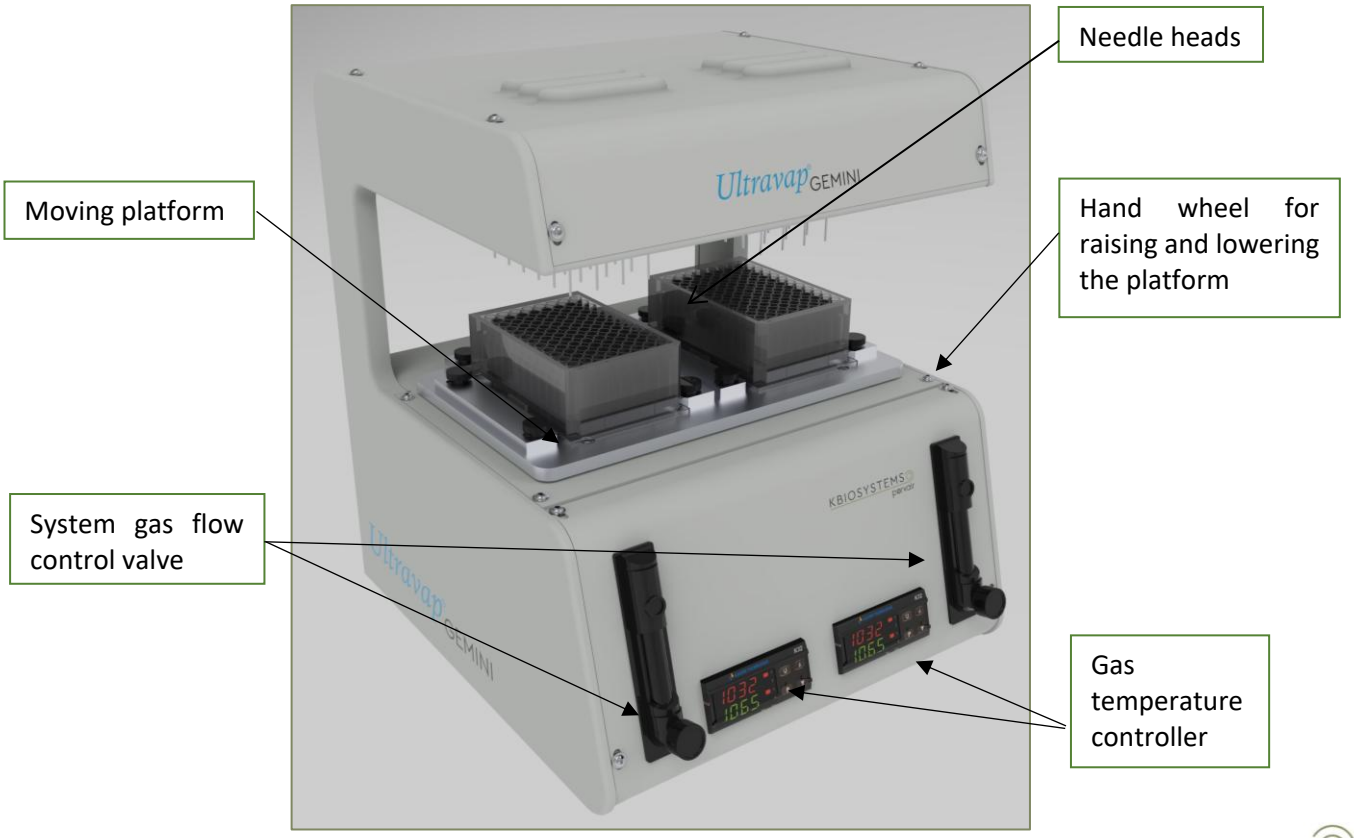
Once the unit is correctly connected to gas and mains power supplies and a suitable Needle Heads are installed, as described in the previous sections, the unit is ready to be setup for use.

This involves the following steps:

- Platform adjustment
- Temperature setting
- Setting Inlet Operating Pressure
- Setting System Gas Flow
- Sample concentration using unit

Turn the power on at the IEC power inlet at the rear of the instrument; the temperature controller will display the previously set temperature and ambient temperature of the gas manifold.

Note: Ensure that the system gas flow control valve is closed otherwise the unit will start to heat up and dispense gas prematurely

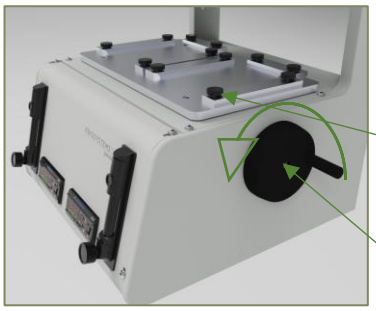


5.2 Operational procedure

This is the overview of the display on the unit. This screen displays the gas manifold temperature and the set temperature.

The 4 functional buttons on the right-hand side control the settings of the unit. The up/down arrows allow you to change the temperature and maintenance functions. The P enables you to select what you want to adjust, including temperature and maintenance functions.

Note: Only press the keys as outlined in these instructions. Pressing key 'U' has no effect during normal operation – no user functions available. Incorrect pressing of either keys 'P' or 'U' may result in undocumented / error screens. The display will return to the default screen if no keys approximately 15 – 20 seconds.



Here you can see the hand wheel for raising and lowing the platform alongside the adjustable bars on the bed plate.

Loosen thumb screws to move adjustment bars

Rotate anticlockwise to lift plate carrier

To avoid damage to either Needle Head or sample plates, the position of the microplate to be used should be set on the moving platform before setting the instrument. To allow this, the unit is fitted with adjustable bars mounted on the moving platform – as illustrated above.

To correctly position the microplate, carry out the following steps:

- Loosen both rear and side adjustment bars by rotating knurled retaining screws counterclockwise.
- Place Microplate on moving platform inside adjustment bars
- Raise platform using hand wheel until needles are just above the top of the plate
- Visually align plate so that the needles are positioned centrally above each well
- Secure in position by moving location bars until they are just touching the microplate and tightening the knurled retaining by rotating clockwise, recheck position and adjust if required
- Raise the platform slowly, checking position of the needles, until they are inserted almost to the full depth of the wells. Recheck the position periodically during this process and adjust if necessary. This is particularly important with spiralled needles which could potentially collide with the side of the wells if inserted beyond the vertical sections of the wells. It may be easier to loosen all the adjustment bars and gently move the microplate ensuring that it can move freely without touching the tips of the needles. Secure in position once this check is carried out
- Lower the platform to its home position using the hand wheel.

5.3 Temperature and pressure setting

Once the gas supply is established and the mains power is switched on at the IEC inlet at the rear of the instrument, the temperature controller will display the following screen at start up.

After a few seconds the screen will return to its default display: -

The Display may show a negative temperature on power-up (from cold). This will align itself, once the target temperature has been reached and is perfectly okay.

Press key 'P', this screen will display. Adjust temperature setting using the up and down arrow keys. Do not press any keys for approximately 30 seconds. The screen will return to the default display.

Note: The instrument will not start to heat up if the gas flow is less than 25 L/min see following sections for setting operating pressure and system gas flow.

Setting Inlet Operating Pressure

To obtain optimum performance it is necessary to correctly set the gas supply to the instrument before adjusting the System Gas Flow – see following section.

Note: This setting is carried out at the supply regulator and is not the value shown on the system gas flow meter. Due to internal pressure and distribution losses this is not the gas pressure through individual needles.

To set up the Inlet Operating Pressure, carry out the following step:

- Ensure System Gas Flow Meter valve is fully closed (turn clockwise) and adjust supply system regulator to a value of between 4 Bar (58 psi) and 7 Bar (100 psi).

Seeing System Gas Flow

The unit is designed to work with a gas flow between 25 and 100 L/min. For optimum performance a setting of 70 L/min is recommended. This is the value shown on the system gas flow meter. Once the system inlet pressure is set, adjust the system gas flow valve to give the desired flow rate by turning the valve counterclockwise.

Once the flow rate exceeds 25 L/min the instrument will start to heat the gas and the temperature indicated on the display will start to rise. The diameter of the needles has been optimised to allow high gas flow rates (> 75 L/min) to be used while minimising sample disturbance. This allows quicker sample concentration without the risk of cross contamination.

Sample Concentration

To proceed with sample concentration using the unit carry out the following steps:

- Set temperature and gas flow as described in previous sections
- Wait for instrument to reach the set temperature
- Place the microplate containing samples in correct position on platform
- Raise the moving platform by turning the hand wheel, located on right side of the instrument, counterclockwise until the needles are approximately 4mm from the top of the plate or the sample.

- Allow the unit to concentrate the sample adjusting the position of the moving platform periodically, if required.
- On completion; lower moving platform to its home position by turning the hand wheel clockwise.
- Remove microplate with concentrated sample

6. Maintenance and troubleshooting

6.1 Troubleshooting

Unit repairs and servicing are to be undertaken only by approved Kbiosystems personnel. Do not use cleaning agents or solvents on the unit.

Problem	Recommended Action
Nothing happens when the unit is switched on	• Check power to the unit. Check the condition of the fuses.
Flowing gas does not heat	• Check that the inlet gas pressure is greater than 4 Bar (60 psi). Turn the unit off and on again to reset heater.
No gas emits from the needles	• Check that the gas inlet supply is sufficient. Check integrity of head gasket. Check for gas leaks.
Certain wells do not dry down	• Check visually that the needles are not blocked, bent or damaged. Due to the nature of the heated gas, the pins towards the centre of the head plate will generally be slightly warmer.
The instrument continues to emit gas after a method has finished	• Turn the unit on and off to reset the gas regulation.

Note: For other failures it is recommended that you consult your local supplier directly. Do not dismantle the unit without prior authority of Kbiosystems since this will invalidate the warranty.

6.2 Identifying your unit

For all warranty and service requests the serial number and year of manufacture of the unit are required. These are located on the manufacturer's plate on the underside of the instrument.

6.3 Cleaning the instrument

- Wipe clean all splashes immediately with a clean tissue or lint-free cloth.
- Switch off and disconnect from mains power supply before cleaning the instrument.
- The instrument is to be cleaned only by wiping with a decontaminating solution at the manufacturer's guideline concentration, applied using a clean tissue or lint- free cloth.
- Do not allow the instrument to come into direct contact with solvents or other potentially corrosive solutions.
- Do not autoclave any parts of this instrument other than the Needle Head.

6.4 Cleaning /Examining needles

It is occasionally necessary to clean or examine the needles. To facilitate either of these operations remove the Needle Head according to previously noted instructions – refer to **Fitting / Changing Needle Head**

To clean contaminated needles, carry out one of the following procedures:

1. Autoclave the needle head according to your company's standard protocol
2. Using a 2ml deep well microplate, immerse the needles fully into the plate, partially filled with a suitable strong solvent. DO NOT use strong alkali solutions since they could damage the aluminium manifold plate. Ensure that the cleaning solution only comes into contact with the needles

After a suitable period of time (possibly overnight), remove the needle head from the solvent and examine. If it has been cleaned satisfactorily decontaminate it will suitable solvent or deionised water.

Reinstall the needle head and operate the unit for several minutes until needles are completely dry.

Please note that when reinstalling the needle head, great care must be taken to ensure that the gasket is present and positioned correctly.

7. Warranty

The Ultravap GEMINI is provided with a 1-year back-to-base warranty as standard. The warranty is applicable from the date of purchase and covers repair or replacement by Kbiosystems if the product is defective or non-functional. Exclusions apply:

- Products purchased second-hand or from unauthorised vendors. Only new products purchased from Kbiosystems are covered.
- Persons not listed as the original purchasers in the order information.
- Damage caused by a failure to follow the instructions provided in section **1. Safety Information.**
- Damage caused by abuse, accident, neglect, or misuse.
- Damage caused by connection to incompatible gas source.
- Damage caused by use of unauthorised (e.g., third party) components or peripherals.
- Unauthorised attempts to repair, modify, or disassemble the product by unqualified or unauthorised persons.

For further information on the warranty and returns procedure, contact Kbiosystems:

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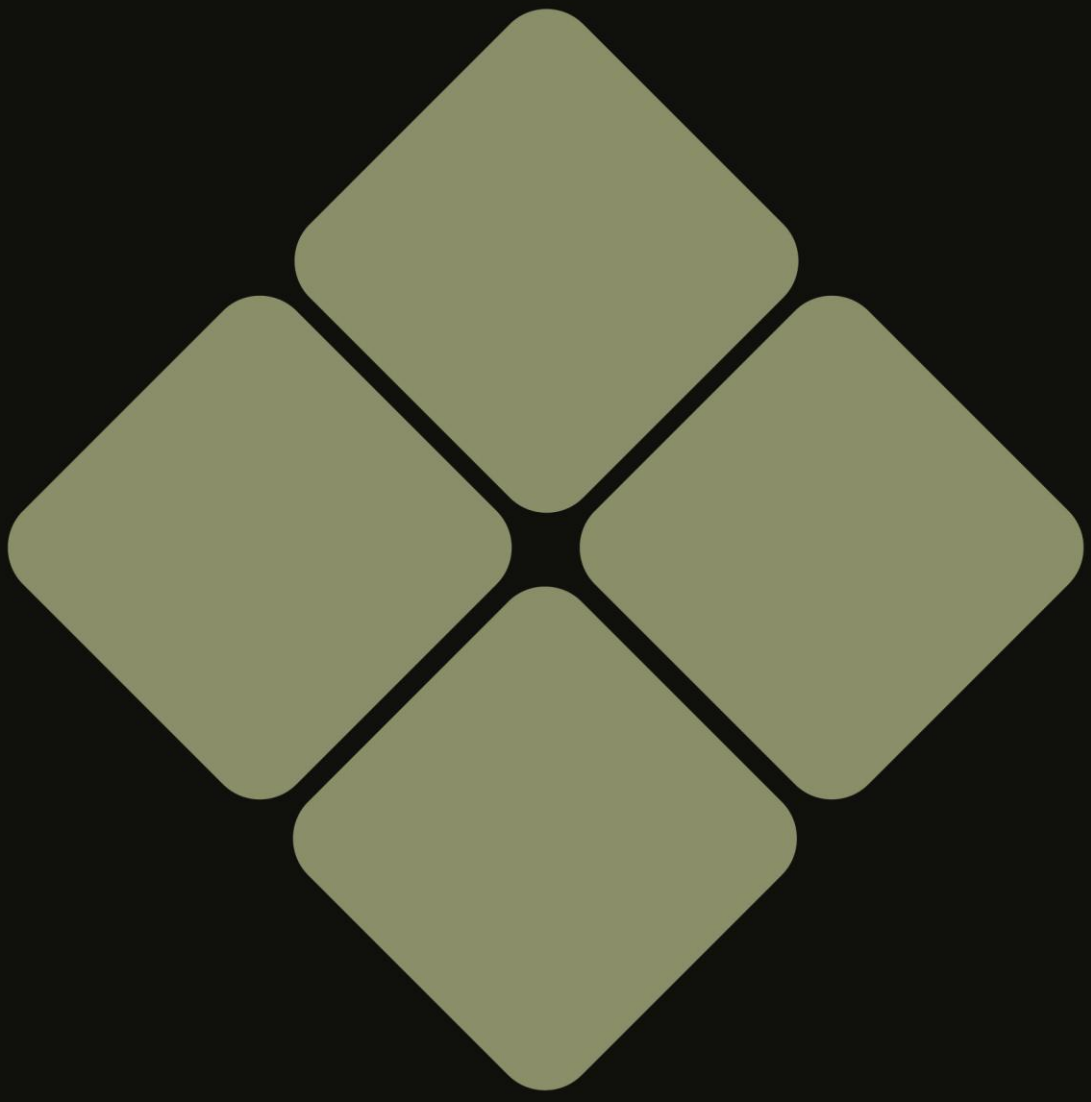

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