

User Instruction Manual



User Instruction Manual

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Introduction

The MiniVap Gemini has been developed as a blow down sample concentrator, to allow evaporation of solvents, from microplates in minutes, rather than hours. This model is specifically designed to accommodate two microplates at a time by featuring a double positioned platform.

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 96 well plates (conforming to the standards mentioned on the next page). The instrument when fitted with compatible straight or spiral needle heads, which offers improved drying efficiency, can be used with 96 well plates. All evaporator heads are easily interchangeable. The device will accommodate either 24, 48, or 96 well plates, with straight needles, or spiralled needles (96 plate only).

The MiniVap Gemini blows heated gas (typically Nitrogen) into the wells and accommodates both deep and shallow well plates. The platform containing the well plates, is settable in elevation to suit well plate dimensions and dry-down protocol.

This product 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 marked unit fits into fume cupboards, or may be integrated into a dedicated fume extraction unit.

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Installation

Before use, carry out the following steps:

- Visually inspect MiniVap Gemini for damage.
- Check that correct needle head is supplied and inspect for damage.
- Ensure a suitable power cord is supplied.
- Ensure that gas and electrical supplies are correct – see [Specifications & System Requirements](#).
- Place MiniVap Gemini on a flat surface with a fume hood or well-ventilated area
- Connect the MiniVap Gemini to gas and electrical supplies – see [Connecting the Gas & Power Supply](#).
- Fit the Needle Head – see [Fitting / Changing Needle Head](#).
- Carry out adjustments (if needed) of the MiniVap Gemini – see [Adjustments](#).

Report all damaged or missing components to your supplier or distributor immediately.

Microplate Requirements

The MiniVap Gemini can be used with microplates that, as a minimum, conform to the following standards:

ANSI/SBS 1-2004: Microplates – Footprint dimensions

ANSI/SBS 4-2004: Microplates – Well positions

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Health & Safety

It is Important that the MiniVap Gemini is installed and operated in such a way that all applicable Health and Safety requirements are met. It is the users responsibility to ensure that all relevant Health and Safety Regulations are identified and complied with. Failure to do so, may result in damage to the equipment and could cause personal injury. In particular, the user should study the contents of this guide carefully before handling or operating this equipment.

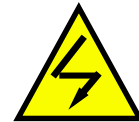
All users should be fully trained and have a full operational knowledge of the equipment.

Under no circumstances will the supplier of this equipment be liable for any incidental, consequential or any special damages of any kind whatsoever, including but not limited to lost profits arising from, or in anyway connected with the use of this equipment or this instruction manual.

If the unit is opened or tampered with in any way, the units warranty is invalidated immediately.

WARNING SYMBOLS in accordance with IEC 417

Risk of Electric Shock



Moving Equipment



WARNING

Refer to accompanying documentation



Earth Protective Conductor



Mains Switch Symbols

I - 0
I = ON 0 = OFF

DANGER - Hot Surface/Area



User Instruction Manual

Health & Safety

Environmental Requirements:

Temperature Range:	Operating 15°C to 40°C	Storage 0°C to 40°C
Relative Humidity:	Operating 10% to 80%	Storage 10% to 80%

Statement: WARNING - Do not operate this instrument in an atmosphere containing explosive gases.

Statement: WARNING - Only approved, supplied mains cord must be used with this instrument.

Statement: WARNING - If an extension lead is required, the lead **MUST** be earthed.

Statement: VOLTAGE – The MiniVap Gemini is supplied for direct connection to normal 115VAC or 230VAC supply, with a variation in supply that gives a voltage range of 108VAC to 250VAC.

- The provided covers **MUST** be used at ALL times during the operation of the unit.
- At no time should the plates be inserted whilst the unit is in its application state.
- The use of solvents on the unit is not recommended.
- The air supply must be removed and the electrical supply disconnected, prior to the removal of any covers.

The Mains Plug supplied with the MiniVap Gemini unit, is fitted with the following fuse:

Supply	Fuse fitted in plug	Fuse fitted in MiniVap Gemini
230VAC U.K	13 Amp	IEC Main inlet to rear of unit is twin fused, Live & Neutral fuse. (2 x T10AH 250V)
230VAC Europe	No fuse	
115VAC	No fuse	

Only refit the correct type of Fuse. Must be IEC127 approved for use in EC Countries.

Must be C.S.A. or UL listed or recognised for use in Canada or the United States of America.

Porvair Sciences Limited accepts no responsibility for the misuse of this equipment.

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Specifications & System Requirements

Power Supply:	115 - 240 - V AC 50/60Hz
Fuse Rating:	2 x 10 Amp Anti-surge (T10AH 250V)
Dimensions:	182mm x 442mm x 454mm (W x H x D)
Weight:	19.5Kg
Gas Input:	8mm Inlet
Min Operating Pressure:	4 bar (60 psi)
Max Operating Pressure:	7 bar (100 psi)
Flow:	60 L/min - 200 L/min
Min Operating Temp:	15°C
Max Working Temp:	60°C
Protection:	IP 40

Optimum Conditions

Pressure:	5.5 bar (80 psi)
Flow:	140 L/min

Gas Supply Information

A suitable clean, dry, regulated gas supply should be connected to the instrument using 8mm tubing. Use of a filter / separator in addition to supply regulator is strongly recommended. Typical gases suitable for use with the MiniVap 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).

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What's in the Box

Before installing your MiniVap Gemini, please check that all the required contents are in the box. See below for a full list of items.



1 x MiniVap Gemini Unit



1 x UK Power Lead



1 x EU Power Lead

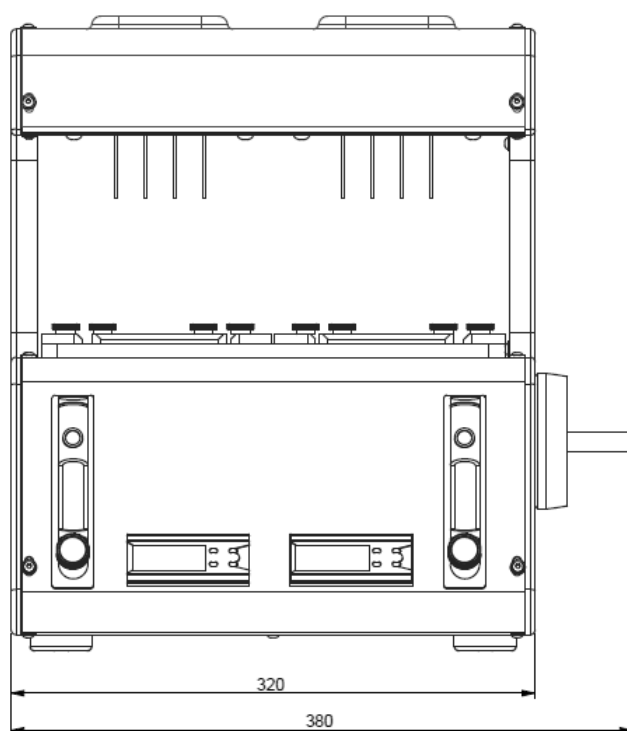
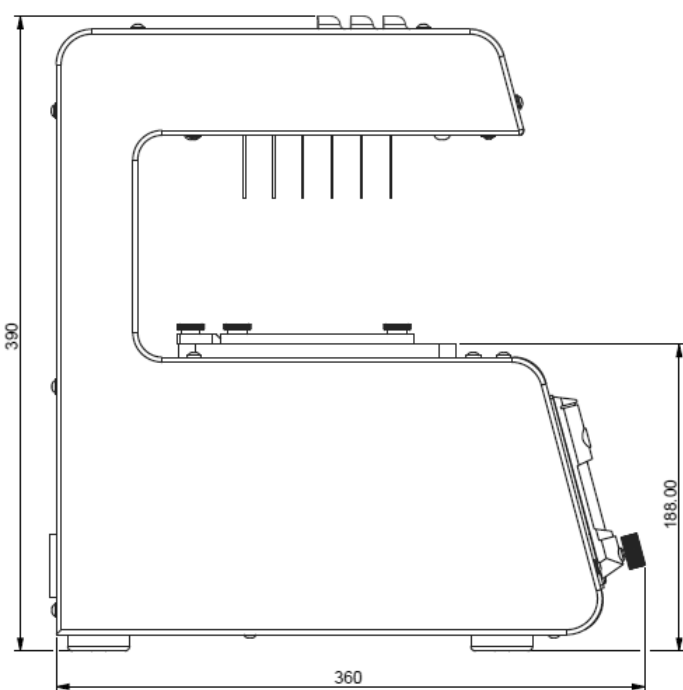


1 x US Power Lead

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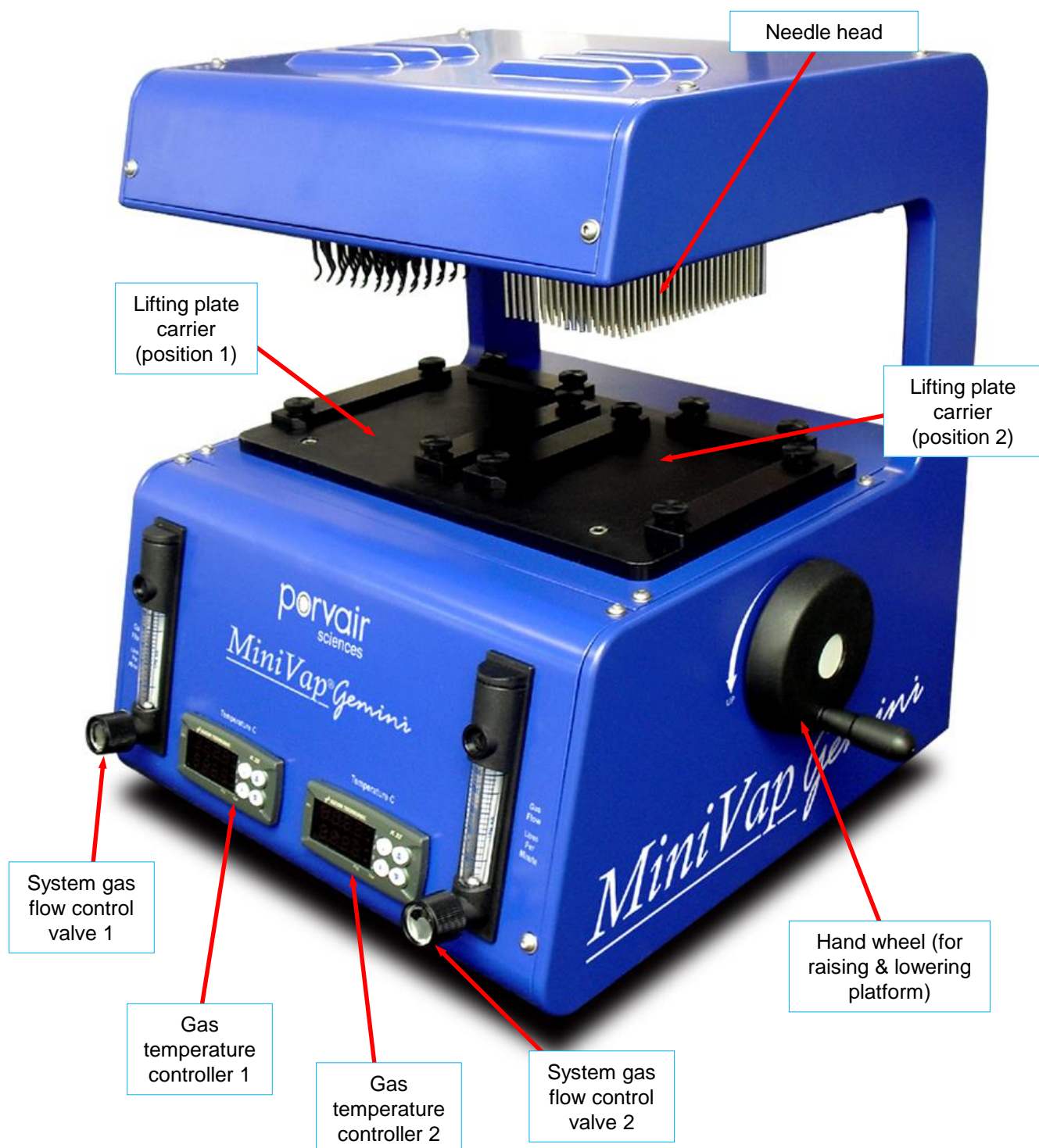
Product Overview

The MiniVap Gemini can be used in integration with other machinery; please take note of the dimensions below for accommodating the size of the unit. All dimensions are in mm.



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Product Overview



User Instruction Manual

Connecting the Gas & Power Supply

Connecting the Gas Supply

Check that the gas supply is within the system requirements.

The gas supply should be connected to the universal connector female 8mm (internal diameter) on the rear of the unit. The connecting tube is a one-touch connection.

Gas pressure should not exceed 7 bar (100 PSI). Exceeding this pressure may damage the unit.

Connecting the Power Supply

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

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Fitting / Changing Needle Head

BEFORE USING MINIVAP GEMINI CARRY OUT THE FOLLOWING STEPS:

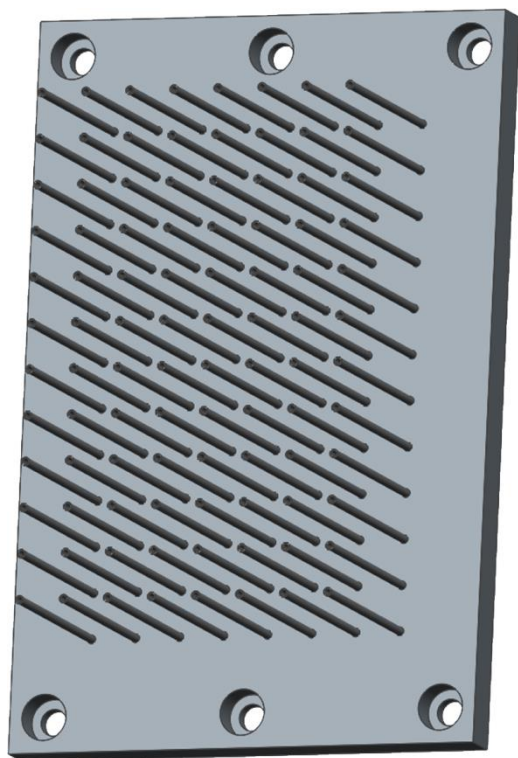
When unpacking your MiniVap Gemini unit, visually inspect the needle array for correct pitch.

- 96 well pitch (distance between pins) should be 9.00mm

This maybe checked by offering up a standard 96 well plate.

Check visually, that no obvious damage has occurred during shipping.

Once you have correctly followed the instructions on connecting MiniVap Gemini to gas and power supplies, the unit is ready for use.



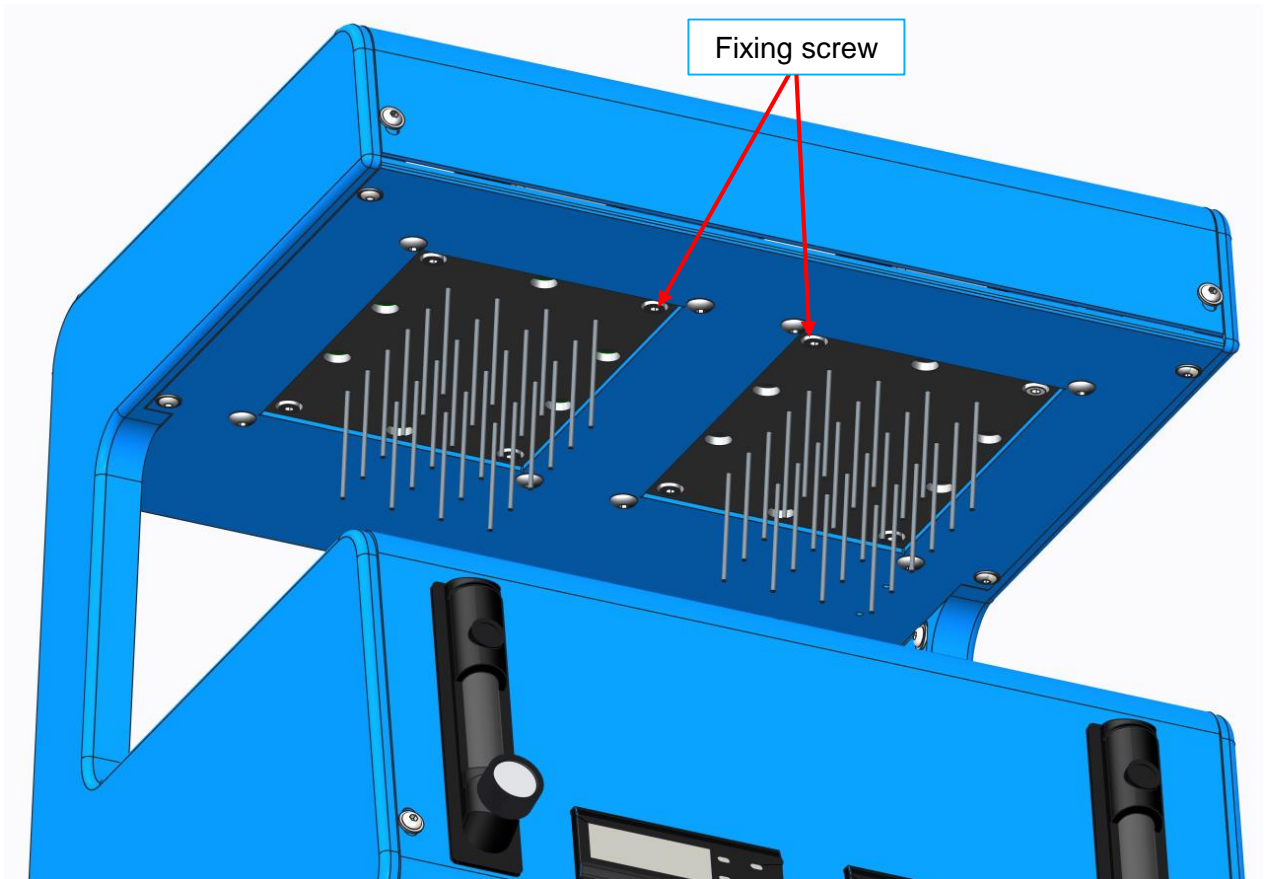
96 Well Head

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Fitting / Changing Needle Head

Before removing / changing the needle head, disconnect the unit from any electrical supplies and gas. Also ensure MiniVap Gemini has cooled down sufficiently if used.

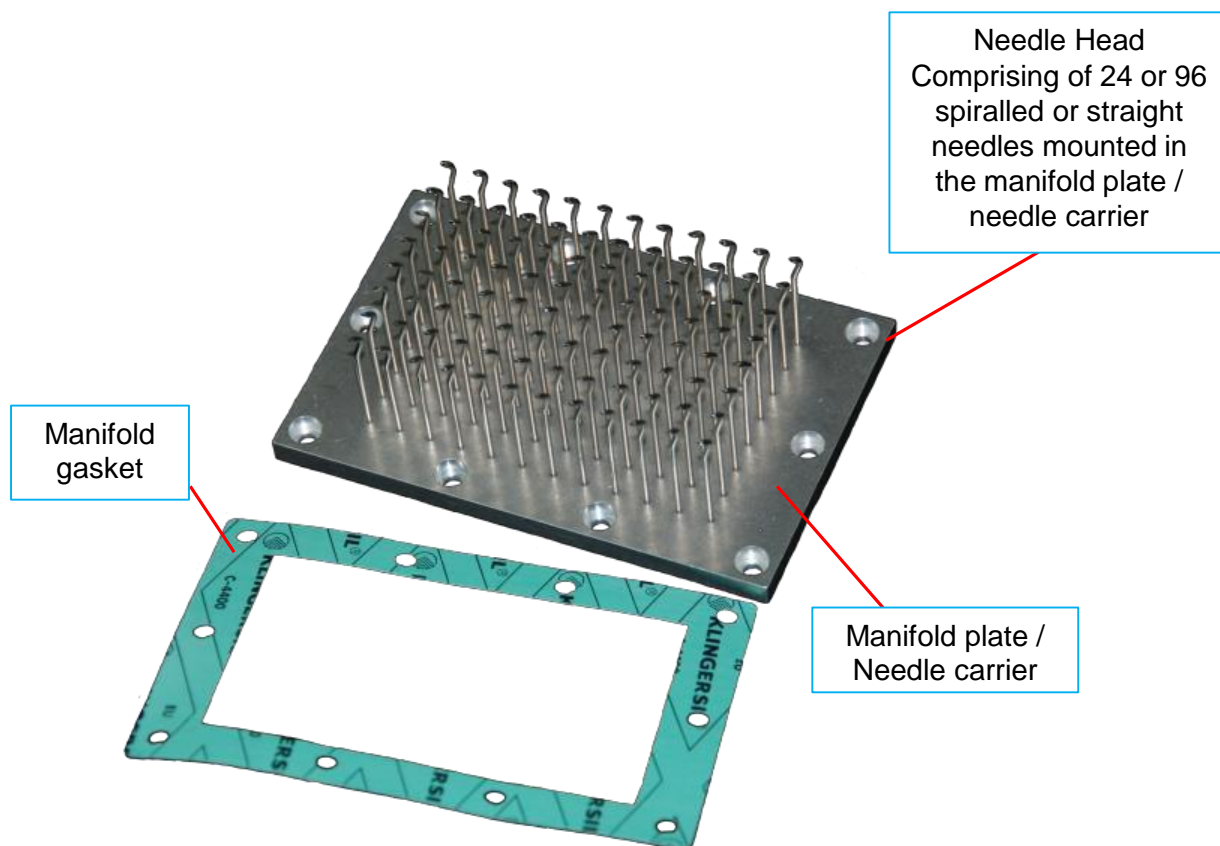
- Remove the safety guard.
- To remove the needle head, remove the four fixing screws, using the Allen key provided. Turning the unit on it's side may make this process easier (ensure it is placed on a suitable surface and a cloth is used if necessary for protection).
- Carefully remove the head, avoid bending or damaging needles.
- Inspect gasket for tears and replace if needed.
- When replacing the needle head, great care must be taken to ensure that the gasket is present and fitted correctly. For ease of fitting; the needle head will fit either way round.



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Fitting / Changing Needle Head

Disassembled needle head showing 96 spiral needles:



Please Note: Spare needle heads are available from Porvair Sciences. In order to fit these to Minivap Gemini, it will be necessary to first remove the spring clips on the two captive bolts supplied as part of each head. The bolts will be in an incorrect position, as supplied, and must first be re-located before the head can be fitted to Minivap Gemini. A flat-head screwdriver is supplied with each spare head to assist you to remove the spring clips.

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Operating Instructions

Once the MiniVap Gemini is correctly connected to gas and mains power supplies and a suitable needle head is installed, as described in the previous sections, the unit is ready to be set up for use.

This involves the following steps:

- Adjusting the platform
- Platform lifting and lowering
- Temperature setting
- Setting inlet operating pressure
- Setting system gas flow
- Sample concentration using MiniVap Gemini

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

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

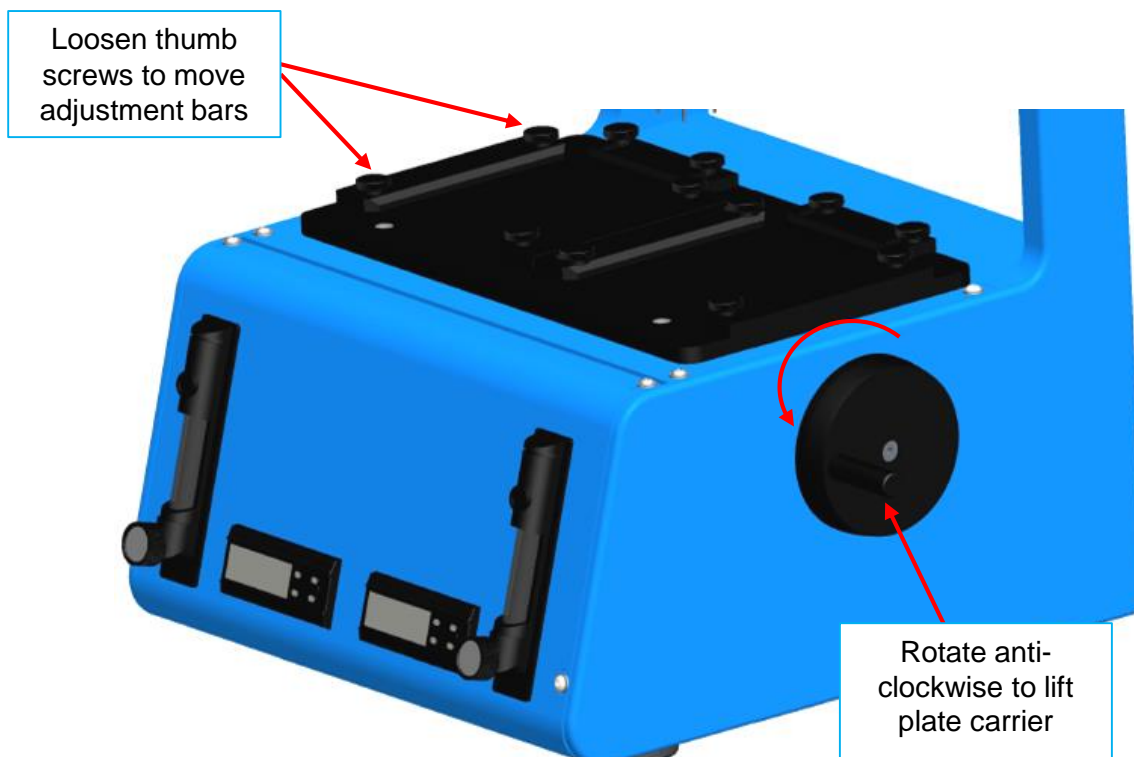
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Operating Instructions

Adjusting the Platform

The MiniVap Gemini has an adjustable platform, which has adjustment bars that can be moved for accommodating different samples and optimal positioning.

- Adjustment is carried out by loosening the location thumb screws (done by hand), positioning a microplate by moving the adjustment bars (sides and rear) and re-tightening the screws.
- Check that the needles are centrally located above each well by raising the platform and visually aligning the microplate to the needles. This is done by turning the hand wheel anti-clockwise. If the plate is not located properly, move the carrier to correctly align the plate.
- 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.

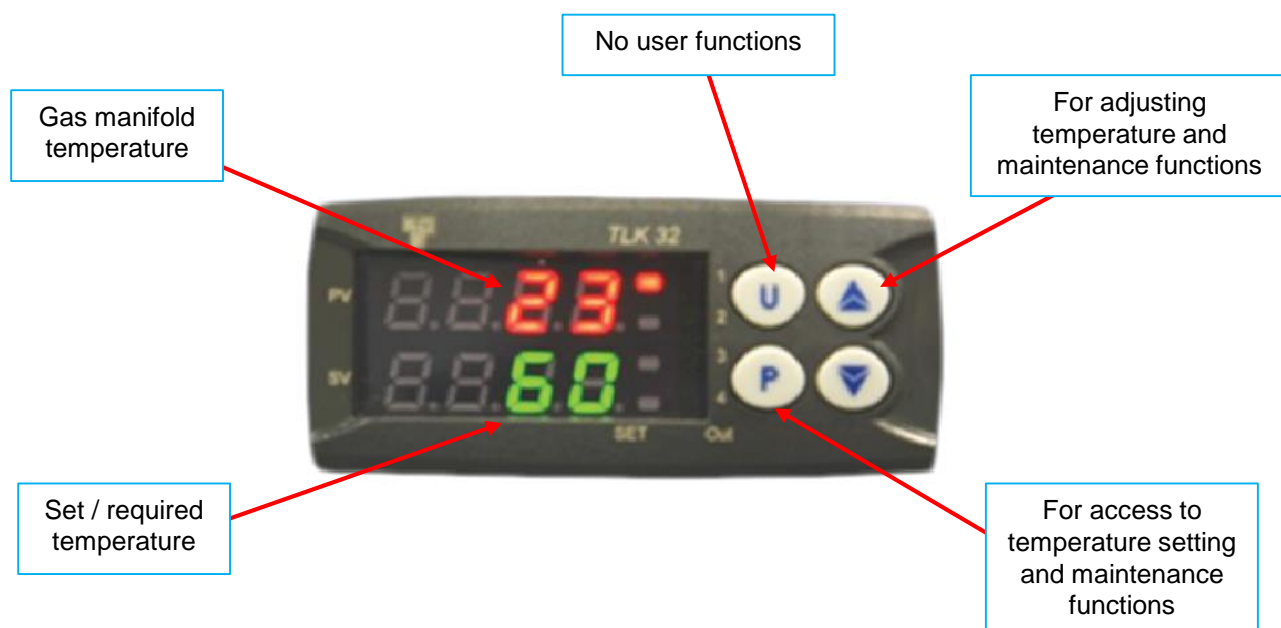


Important note: The MiniVap Gemini works by using both positions simultaneously; (gas will run through both needle heads) therefore if the second plate carrier is not in use ensure that a needle head is fitted to keep the machine running consistently.

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Operating Instructions

Temperature Setting



Important 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 are pressed approximately 15 – 20 seconds.

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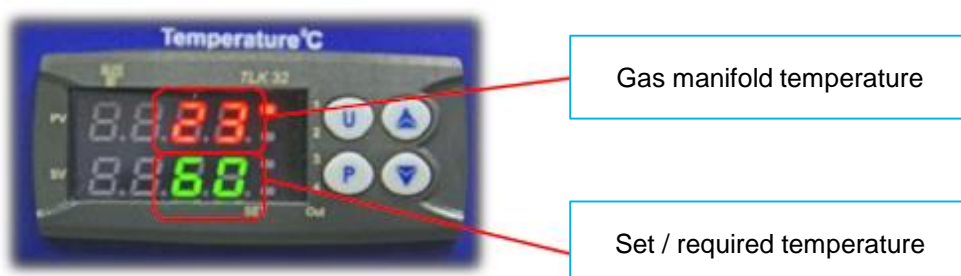
Operating Instructions

Temperature 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: -
Any new unit, may show a negative temperature on power-up (from cold).
This will align itself, once the target temperature has been reached and is perfectly acceptable.



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Operating Instructions

Temperature Setting

Press key 'P', the screen will display:



Adjust temperature setting using keys: ▲▼

Do not press any keys for approximately 30 seconds . The screen will return to the default display, shown below:



Important 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.

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Operating Instructions

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)
- Adjust supply system regulator to a value of between 3 bar (45 psi) and 5 bar (75 psi). The instrument will operate with operating pressures as low as 2 bar (30 psi) but for optimum performance it is recommended that the regulator is set to supply a pressure of 5 bar (75 psi)
- The gas supply system should be set to the maximum sustainable pressure if the optimum pressure of 5 bar (75 psi) cannot be achieved or maintained.

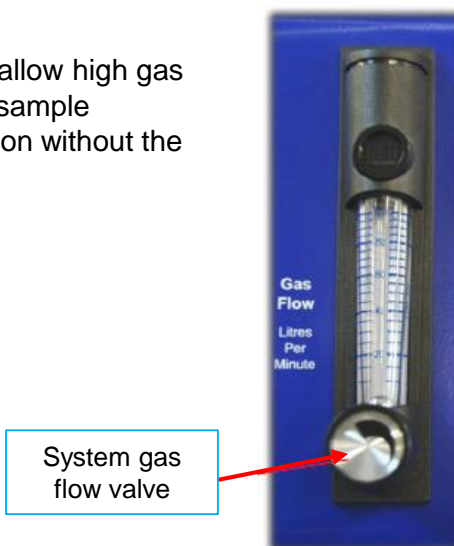
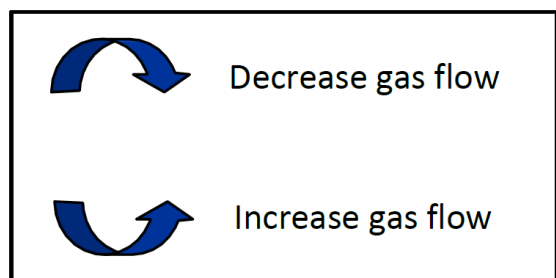
Setting System Gas Flow

The MiniVap Gemini is designed to work with a gas flow between 50 and 200 L/min. For optimum performance a setting of 70 L/min on each gauge is recommended. This is the value shown on the system gas flow meter.

Once the system inlet pressure is set to 5 bar (75 psi), or the maximum that can be maintained, adjust the system gas flow valve to give the desired flow rate by turning the valve anti-clockwise.

Once the flow rate exceeds 25 L/min on either gauge, the instrument will start to heat the gas and the temperature indicated on the display will start to rise on that side.

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.



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Sample Concentration using MiniVap Gemini

To proceed with sample concentration using the MiniVap Gemini 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(s) containing samples in correct position on platform .
- Raise the moving platform by turning the hand wheel, located on right side of the instrument, counter-clockwise until the needles are approximately 4mm from the top of the plate or the sample.
- Allow the MiniVap Gemini 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(s) with concentrated sample.

Over Temperature Thermal Cut-out

Please note that the MiniVap Gemini instruments are 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. Once the heater cools down again the cut out will automatically reset itself, and power will be restored to the heaters.

If this occurs frequently, please contact Porvair Sciences immediately as it could indicate a fault.

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Cleaning Information

Before using any cleaning or decontamination method, other than that recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the unit.



Always remove the power and pneumatic supplies before cleaning the unit.



Never turn on power and pneumatic supplies before the unit is fully dry.



DO NOT USE ACETONE OR ABRASIVE CLEANERS.



User Instruction Manual

Cleaning Information

The MiniVap Gemini is designed to provide years of trouble free operation with virtually no maintenance. Follow the simple procedures below to ensure that your MiniVap Gemini continues to deliver top performance.

General Cleaning

- 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 decontaminating solution at 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.

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Cleaning Information

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 the 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 (Porvair P/N 219009), 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.
3. 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 with a suitable solvent or de-ionised water reinstall the Needle Head and operate the MiniVap Gemini for several minutes until needles are completely dry.

Cleaning the Needle Head

This can be achieved in two ways:

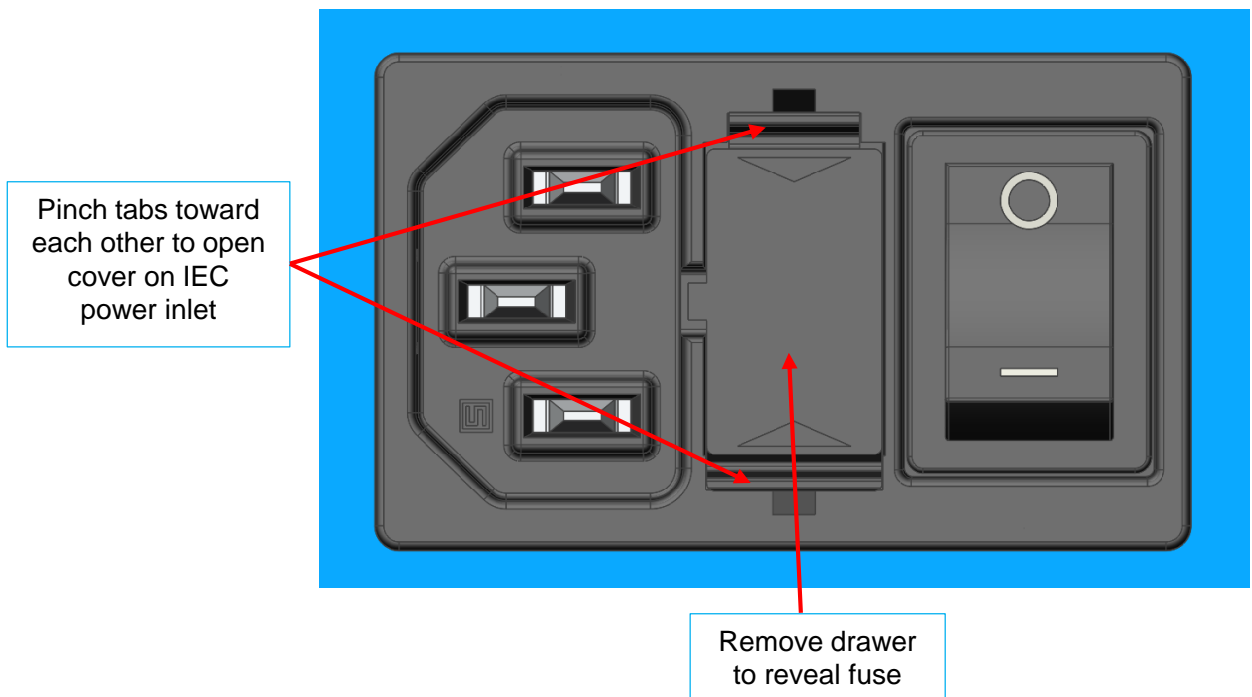
1. Remove the needle head and autoclave to your company's standard protocol.
2. Using a 2.0ml deep well micro-plate, immerse the needles fully into the plate, filled with a suitably strong solvent (4M nitric acid is commonly used).
3. After a suitable period of time, remove the needle head from the plate and operate the MiniVap Gemini for several minutes, until the needles are completely dry.

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Changing Mains Protection Fuse

To replace mains protection fuse, in the event of failure, carry out the following procedure:

- Switch off and disconnect from mains power supply.
- Pinch tabs together (can use small flat-bladed screwdriver) to open fuse cover on IEC mains power inlet.
- Replace defective fuse – ensure replacement fuse is of the correct rating – refer to [Specifications and System Requirements](#).
- Close fuse drawer and cover.
- Reconnect to mains power supply, switch on and test.



User Instruction Manual

Fault Finding

WARNING: THIS EQUIPMENT SHOULD ONLY BE DISMANTLED BY PROPERLY TRAINED PERSONNEL. REMOVING THE MAIN COVER EXPOSES POTENTIALLY LETHAL MAINS VOLTAGES.

Common Faults

- Nothing happens when the unit is switched on
- The unit turns on but the gas does not heat, or displays.
- No gas emits from the needles
- Certain wells do not dry down

Solution

- Check power to the unit. Check the condition of the fuses.
- Check that the inlet gas pressure is greater than 4 Bar (60 psi). Turn the unit off and on again to reset heater.
- Check that the gas inlet supply is sufficient. Check integrity of head gasket. Check for gas leaks.
- Check visually that the needles are not blocked. Check visually that the needles are not bent or damaged. Note that due to the nature of the heated gas, the pins towards the centre of the head plate will generally be slightly warmer.

Special Note

For other failures it is recommended that you contact your supplier. Do not dismantle the unit, as this will invalidate the warranty.

User Instruction Manual

Identifying Your MiniVap Gemini

Identifying Your MiniVap Gemini

For all warranty and service requests the serial number and year of manufacture of the MiniVap Gemini are required. These are located on the back panel at the rear of the instrument.

porvair
sciences

SERIAL NUMBER

1	2	3	4	5	6	7	8	9	0
									●
									●
●									
				●					

MANUFACTURED DATE

01	02	03	04	05	06	07	08	09	10	11	12
					●						

2017	2018	2019	2020	2021
●				

VOLTAGE	POWER	FREQUENCY	FUSE TYPE	MASS
115- 230VAC	800W	50Hz±60Hz	T10AH-250V	19.5Kg

PRODUCT NUMBER: 051

GAS SUPPLY: Max. 7 Bar Pressure
Min. 200L/Min. Flow

CE

Manufactured in the United Kingdom

Porvair Sciences Limited Unit 73 Clywedog Road South
Wrexham Industrial Estate LL13 8XS United Kingdom
T: 01978 666238/666240 F: 01978 660007 W: porvair-sciences.com

Serial Number = **051-0015**
with product number in the prefix
(example shown)

Date of Manufacture = 06 / 2017
(example shown)

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Declaration of Conformity



kbiosystems Ltd
Units 5 to 10 Paycocke Close
Basildon
Essex SS14 3HS
United Kingdom

Tel: 01268 522431
www.kbiosystems.com

EC Declaration of Conformity

We kbiosystems Ltd at above address declare under our sole responsibility that the product detailed below complies with the requirements of the following EU Directives,

- *Machinery Directive 2006/42/EC*
- *Low Voltage Directive 2006/95/EC*
- *Electromagnetic Compatibility Directive 2004/108/EC*
- *RoHS Directive 2011/65/EU*


Equipment description: MiniVap Gemini Sample Evaporator

Product Model: 250-10051

Compliance of the equipment has been demonstrated by assessment with reference to the following harmonised European Standards:

- *EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*
- *EN ISO 12100:2010 Safety of machinery — General principles for design — Risk assessment and risk reduction*
- *EN 61326-1:2006 - Electrical equipment for measurement, control and laboratory use. EMC requirements.*

A technical file for this equipment is retained at the above address.

	Signature
Alan Shepherd	Name of signatory
Technical Director	Position of signatory
Basildon, April 2015	Place and Date of Issue

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Spare Parts & Accessories

Description

Part Number

Replacement needle head with 24 straight needles	229409
Replacement needle head with spiral needles for Minivap / Ultravap 96	229072
Replacement needle head with straight needles for Minivap / Ultravap 96	229036
Gasket for manifold	229048

User Instruction Manual

Warranty & Returns

In the event that your MiniVap Gemini malfunctions or requires repair it is recommended that you consult your local supplier directly. Alternatively, for warranty issues please contact Porvair Sciences directly at the address below.

Do not dismantle the unit without prior authority of Porvair Sciences Limited or the manufacturer since this will invalidate the warranty. There are no user serviceable parts within the casing of the instrument.

NOTICE

Do not attempt to repair the MiniVap Gemini yourself. Repairs should be performed only by Authorised personnel only.



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