

Positive Pressure Manifold

User Manual

KBF167-10083-001 Version 2.0-25

8090-10083-001

UltraPPM^{LITE}

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



Document Information

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Publication and Purpose

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This document provides installation and operating instructions for the UltraPPM LITE.

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	Safety Instruction: Wear appropriate gloves
		

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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

The UltraPPM Lite has been designed to perform manual sample preparation techniques such as, Solid Phase Extraction (SPE), protein precipitation, phospholipid removal or Supported Liquid Extraction (SLE) using pressurised gas.

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 Installation Safety



Caution: Injury / Product Damage (Product Weighs at Least 12 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.

1.4 Operational Safety



Caution: Finger entrapment / Injury (Fingers May be Caught Under the Pressure Manifold)

When lowering the pressure manifold head, 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.

Never fully close the adjustable flow control meter valve, as this can cause damage to the unit.

Ensure gas supply is within pressure limits.



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 filter/collection 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.

SAVE THESE INSTRUCTIONS

2. Overview

2.1 UltraPPM LITE

Positive pressure processing confers advantages in usability, reliability, and reproducibility over traditional plate processing methods such as vacuum manifold. By using nitrogen or compressed air to move liquid through a processing plate, sample consistency is improved, and contamination risk is reduced whilst offering more control to the user.

The UltraPPM LITE features an interchangeable head design; for the ability to use different microplate types. This will allow the operator to use one system to process 24, 48, 96 and 384 well plates. Switching between these formats is a user-operation and does not need a high level of training. (See section 4. Configuration).

User safety has also been carefully considered in the design to eliminate risk of operator injury with mechanisms during production.



2.2 Product Features

- Benchtop plate processing
- Fine adjustable flow
- Compressed air or nitrogen compatible
- Interchangeable processing head design for various plate types
- Built in safety features
- Simple to use, sliding carriage design
- Easy to clean and maintain

2.3 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	UltraPPM LITE	250-10083-001	1
2	Gas Input Regulator Kit (with Mounting Bracket, tubing & Fixings)	150-10083-010	1
3	Plate Carriage Adjustment Hex Key	150-10083-011	1
4	Pressure Regulator Anti-Lock Washer (x2)	150-10083-012	1
5	User Guide	8090-10083-001	1

Table 1: UltraPPM LITE Parts Supplied

2.4 Technical Specifications

Item	Specification	Notes
Model	UltraPPM LITE	See section above for part code
Dimensions	285 x 400 / 375* x 355 mm *without gas input regulator	Width x Depth x Height in millimetres
Unit Weight	12 kg	Kilograms
Protection	IP20	Resists dust / objects over 12 mm in size
Humidity Range	10 to 80%	Non-condensing
Ambient Temperature	10 to 30°C / 50 to 86°F	
Input Gas	Nitrogen (recommended) Compressed Air	Clean, dry supply
Gas Supply Pressure	5.5 to 7 Bar (80 to 100 PSI)	Performance may vary at lower input pressures
Flow Control	Two regulators - Adjustable flow (with additional flow meter) - Maximum flow	
Adjustable Flow – Pressure Regulator	0 to 1 Bar (0 to 14 PSI)	
Maximum Flow – Pressure Regulator	0 to 6 Bar (0 to 87 PSI)	

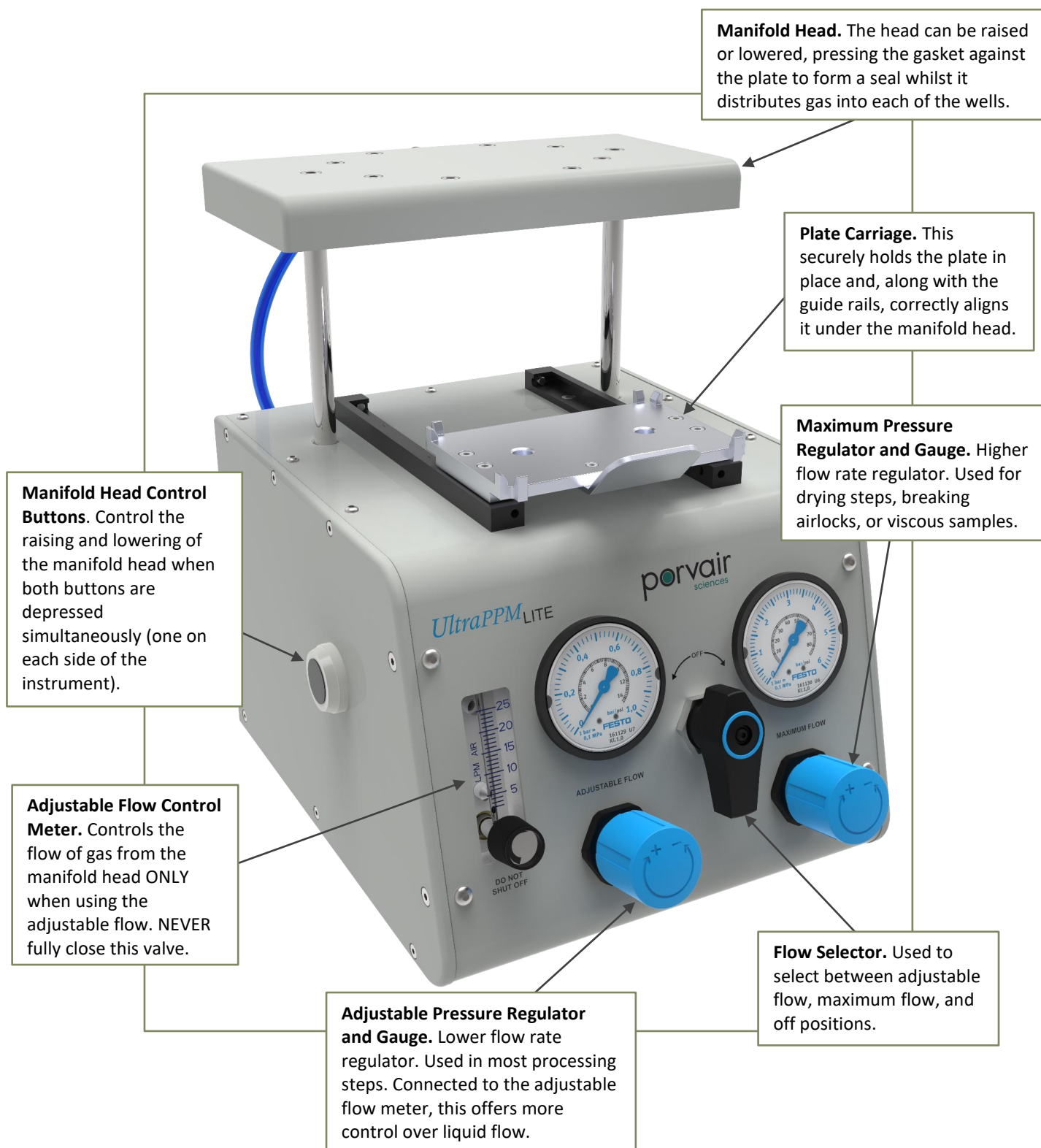
Table 2: UltraPPM LITE Technical Specifications



Nitrogen is recommended for the following reasons:

- Nitrogen is typically cleaner than compressed air which results in cleaner samples.
- Nitrogen is an inert gas which maximises recovery of compounds sensitive to oxidation.

2.5 Product Introduction



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 **2.3 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 **2.4 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 Options



An interchangeable processing head will need to be purchased along with the UltraPPM LITE. Below is the current list of processing heads available.

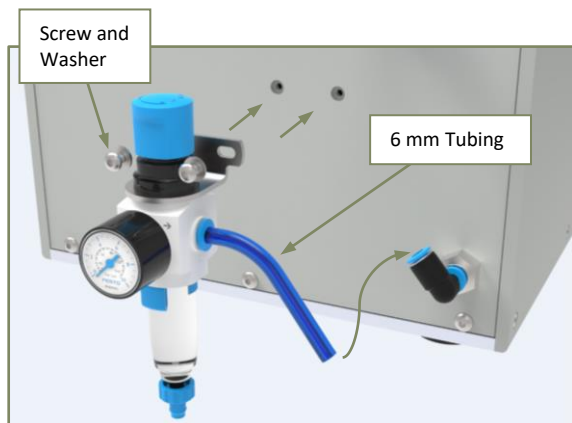
Part No.	Part Name	Part Code
1	96 well processing head	150-10083-001
2	384 well processing head	150-10083-002
3	48 well processing head	150-10083-003
4	24 well processing head	150-10083-004

Table 3: Processing Head Options

4.2 Fitting the Gas Input Regulator

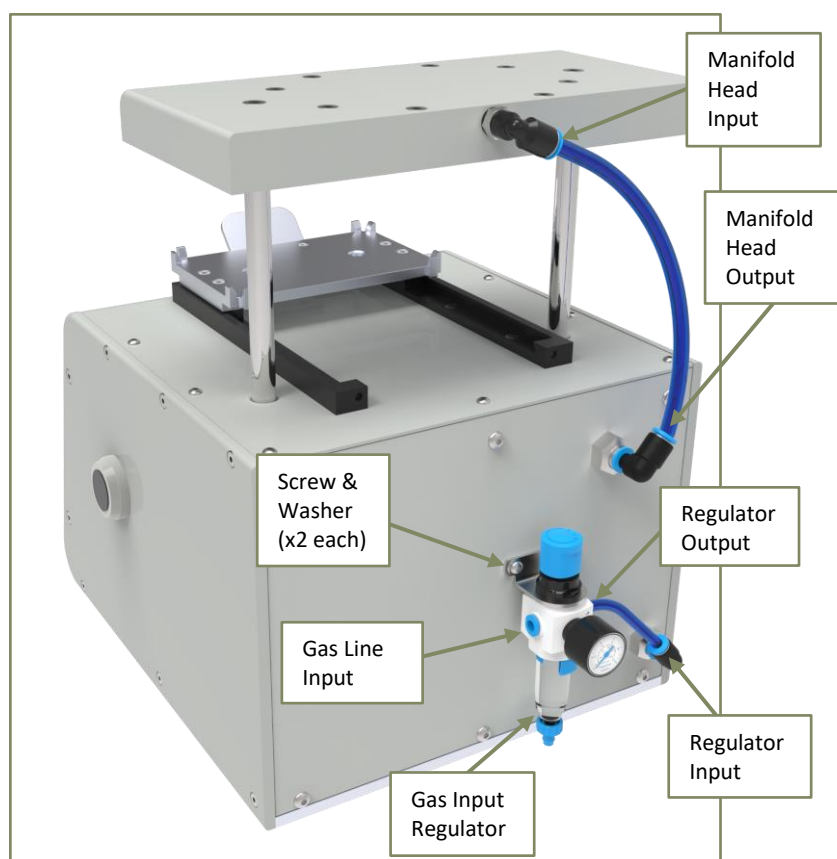


The UltraPPM LITE comes with a Gas Input Regulator that is pre-set to 7 Bar (100 PSI). It is recommended to install this device for optimum performance. Note: The Gas Input Regulator is adjustable and is limited to 7 Bar (100 PSI). This is to protect the internal components. Operating the instrument outside of the pressure limits may result in damage to the instrument and invalidate the warranty.



Gas Input Regulator Installation & Tubing

1. Fit the supplied input gas regulator to the back of the UltraPPM LITE using the 2.5 mm hex key and hardware provided. (Or place in-line near the unit if preferred).

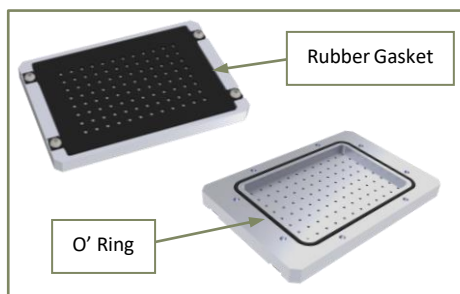


2. Connect the **Regulator Output** to the **Regulator Input** using the supplied short length of 6 mm tubing.
3. Ensure the gas line and gas input regulator are closed with the flow selector set to OFF.
4. Finally, attach your gas supply to the **Gas Line Input**.
5. Turn on the gas supply and ensure the **Gas Input Regulator** is within the working pressure limits.

4.3 Processing Heads Installation



The UltraPPM LITE is compatible with 24, 48, 96, & 384 plate types. This is achieved by utilising an interchangeable head design. The appropriate manifold and gasket will need to be installed prior to running the machine.



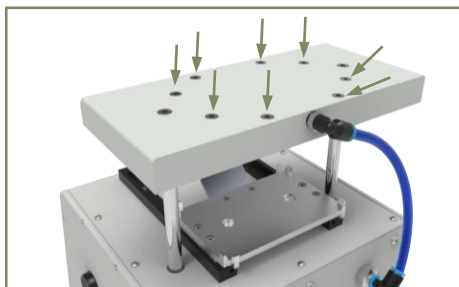
Processing Head & Gasket

Ensure the UltraPPM LITE's processing head has the rubber gasket affixed with the four screws and washers, and that the O' ring is fitted in the groove correctly on the top side.



Inserting the Manifold on the Unit

Insert the eight screws in the holes on the top of the manifold head and insert the processing head underneath.



Affixing the Manifold

Whilst holding on to the processing plate; tighten each screw partially, until all screws are in place. Then fully tighten each one so it is securely attached.



Checking the Plate

Once all screws are tightened, check if the plate carriage needs forward/back adjustment before carrying out a sample preparation run. (See **4.4 Adjustments**).

4.4 Adjustments

If the plate needs adjusting to line up with the processing head, please follow these instructions:



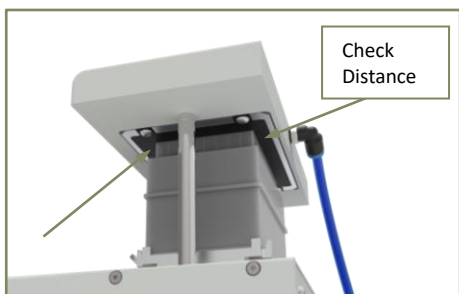
Setup

Ensure there is a gas supply connected to the system, so that the manifold head raises to the top position. Insert an appropriate plate/collection plate in the shuttle and slide it to the back position.



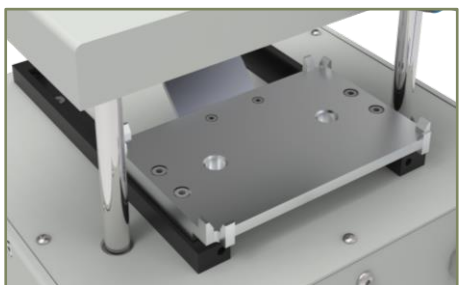
Lowering the Manifold Head

Turn off the gas supply and manually push the manifold head down to the plate.



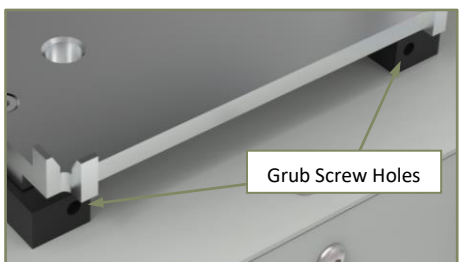
Checking the Wells

From here inspect and check the most front holes line up with the wells in the plate, and the same for the back.



Adjusting the Forward/Back Position

If any adjustment is needed, insert the hex key provided in the grub screw holes located at back of the guide rails and turn the grub screws accordingly.



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 Process Overview

1. Check the positive pressure manifold is connected to the gas source and that the flow selector (1) is in the OFF position.
2. Ensure the Gas Input Regulator (on the back of the instrument) has been set to the required pressure for operation (5.5 to 7 Bar [100 PSI]).
3. Slide the plate carriage (2) out from under the manifold head (3) by pulling away from the manifold head along the rails.
4. With the flow selector in the OFF position, turn the regulator knobs below the relevant gauge (7 or 8) to set the required pressure reading. It is recommended to start with a low pressure and increase as needed. This step is required to allow the user to set the correct pressure before sample preparation is performed.


 **Note:** Turn the knobs clockwise to increase pressure and anticlockwise to decrease pressure. If using the 'adjustable flow', the adjustable flow control meter (9) can be used to have finer control over the flow rate of gas. NEVER fully close the adjustable flow control meter valve.

5. Turn the Flow Selector (1) back to the OFF position to stop gas flow while samples and plates are being prepared.
6. Prepare the samples and plates to be processed as follows:
 - a) Assemble the selected filter plate onto a suitable collection plate creating a stack.
 - b) Add required volume of sample or solvent to the filter plate at the top of the stack.
7. Place the stacked plate assembly containing prepared samples onto the plate carriage (2) making sure it is firmly secured.

8. Move the plate carriage (2) into position under the manifold head (3) by gently pushing the plate backwards until it reaches the stop.
9. Press **BOTH** control buttons (6) on each side of the instrument to lower the manifold head (3) down to seal the filter plate. When the head remains fixed in the lowered position; a seal should be formed.

 **Note:** If the buttons are released too early, the head will return to the previous raised position. Hold the buttons for a minimum of two seconds to ensure the head remains in the lower position and engages with the plate.

10. Turn the flow selector (1) to the desired flow regulator – Adjustable Flow (anticlockwise) or Maximum Flow (clockwise)
 - a. Adjustable Flow (4) is used for finer control using the regulator combined with the flow meter on the left-hand side.
 - b. Maximum Flow (5) for drying steps, viscous samples or if the liquid cannot flow with the Adjustable Flow.
 - c. See **5.2 Flow Control** for a more detailed explanation of flow regulation.

 **Note:** Adjustment to pressures can be made during operation to ensure liquid flow is at a desired level.

11. Once all sample/solvent has flowed through, turn flow selector (1) to OFF. Then briefly press both control buttons (6) once more to raise up the manifold head (3).
12. Remove plate from carriage (2) and continue with protocol until sample preparation is complete.

5.2 Flow Control



Adjustable Flow

The adjustable flow allows for fine pressure control; this is achieved by use of an additional flow control meter, prior to the manifold head. This allows precise control of liquid flow rate through the filter plate and is ideal for most sample preparation stages.

The adjustable pressure can be set between 0 and 1 Bar (0 and 14.5 PSI) and the adjustable flow meter can be set between 2 and 25 LPM (litres per minute).



Maximum Flow

The maximum flow allows for greater pressures at a higher flow rate due to the direct connection between the maximum flow regulator and manifold head. This is typically used for more viscous samples, breaking airlocks or for drying steps during sample preparation.

The maximum flow can be set between 0 and 6 Bar (0 and 87 PSI) with an unrestricted flow rate.

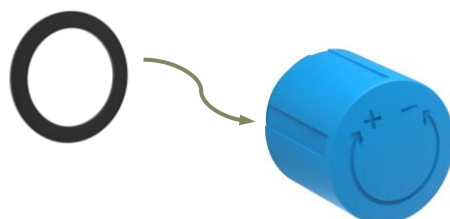
5.3 Lockable Regulator Knobs



The UltraPPM LITE is supplied with lockable regulator knobs for the adjustable flow and maximum flow regulators. Locking the knobs allows the user to fix a set pressure level during processing to prevent accidental adjustment. Lock the knobs by pushing them in once the desired pressure has been achieved.

The knobs can be modified to be non-lockable by inserting the supplied anti-lock washers into the knobs. This stops the locking mechanism from engaging. To do this:

1. Remove the knobs to insert the anti-lock washers by carefully pulling them away from the instrument.
2. Place anti-lock washers inside the knob.
3. Push knobs back onto their respective pressure regulator (adjustable flow or maximum flow), until a “click” is heard.



6. Maintenance and Troubleshooting



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

6.1 Cleaning After Use

- Ensure that flow selector is in the off position and the input gas supply is switched off.
- Use a clean, damp cloth to gently wipe the exterior of the unit and the rubber gasket.

6.2 Annual Maintenance

- Kbiosystems recommends replacing the manifold gasket approximately every 10,000 operations or every 12 months.
- Please contact service@Kbiosystems.com for further information.

6.3 Troubleshooting



If problems persist despite following the recommended actions below, then contact Kbiosystems for advice. See section 7. **Warranty** for contact information.

Problem	Recommended Action
Manifold head fails to lower fully or returns to top position	<ul style="list-style-type: none">• Check incoming gas pressure is within recommended specification. <p><i>Control buttons will typically need to be held for slightly longer if incoming pressure is near minimum limit.</i></p>
Gas leaks between manifold gasket and plate, thus not creating a sufficient seal	<ul style="list-style-type: none">• Check plate is centred (forward/back position may need adjusting) – see 4.4 Adjustments.
No gas flows through the manifold head	<ul style="list-style-type: none">• Check that the gas input regulator on the back of the instrument is at the correct pressure.• Make sure that the flow selector is set to one of the settings – adjustable or maximum flow.
Sample is not flowing through the filter plate	<ul style="list-style-type: none">• If the sample is particularly viscous or has a lot of particulates, it may require higher pressures to push it through. Try slowly turning up the pressure until flow resumes.• There may be airlocks between the sample and filter plate bed. Pulsing the maximum flow on and off rapidly several times can often break the airlocks while making sure the sample does not flow too quick.• Check the condition of the gasket as it is a consumable part. If it is too worn, a seal will not form between the



	manifold and the filter plate which will result in poor performance.
Hissing noise from the Gas Input Regulator or tubing	<ul style="list-style-type: none">• Check that the tubing is correctly inserted into the Gas Input Regulator or the UltraPPM LITE's push fittings. To do this, push all tubing into the push fittings to make sure they are securely fitted.• Check tubing for any obvious damage. Replace any clearly damaged tubing with new tubing.

Table 5: UltraPPM LITE Troubleshooting

6.4 Service, Repairs & Spare Parts



Spare parts and optional extras are available from Kbiosystems. See section 7. **Warranty** for service and sales contact information.

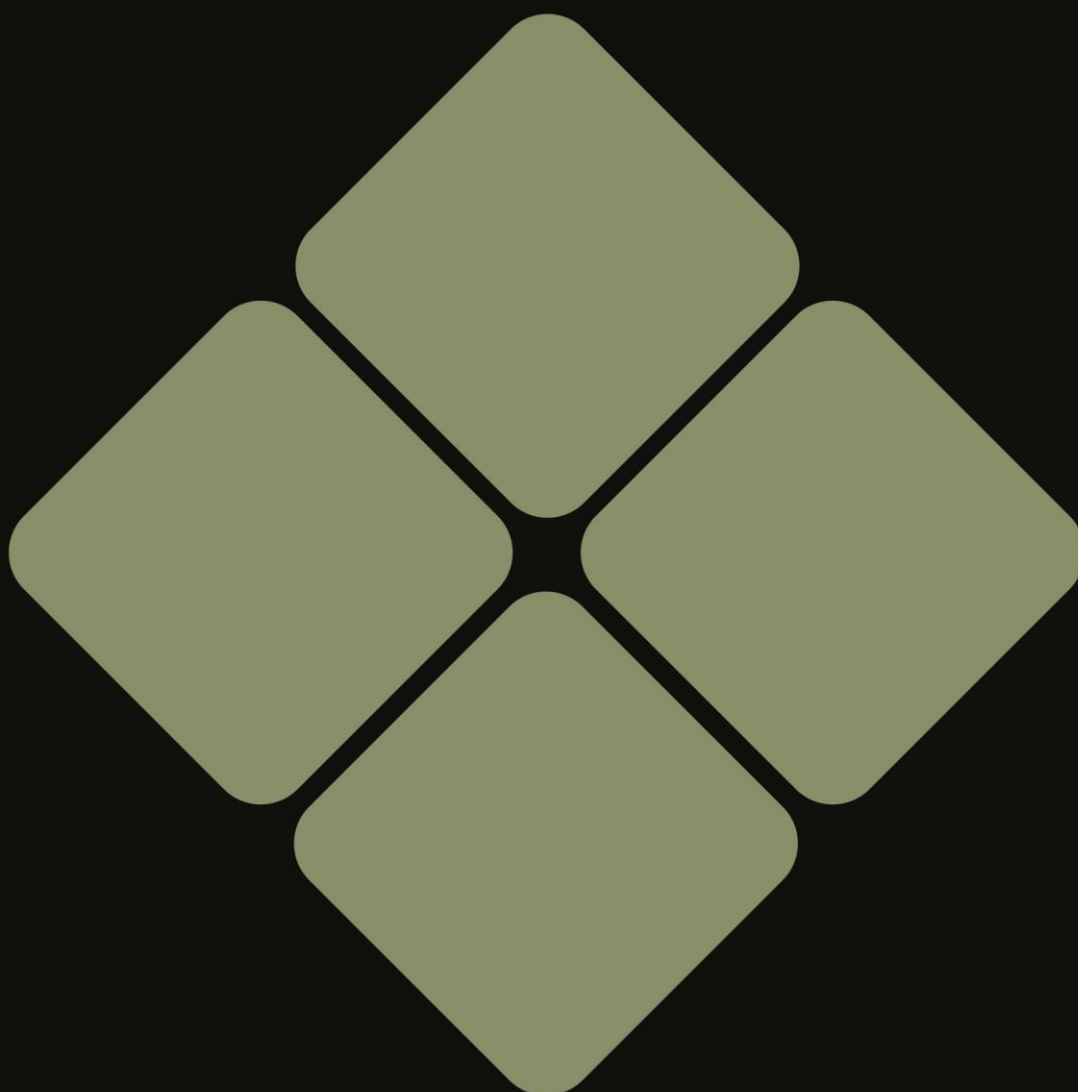
7. Warranty

The UltraPPM LITE 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:

Address	Telephone	Email (Sales)	Website
Kbiosystems Ltd. 5-10 Paycocke Close, Basildon, Essex, SS14 3HS	+44 (0)1268 522431	sales@Kbiosystems.com	www.Kbiosystems.com
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