Arrayjet Ltd.
Midlothian Innovation Centre,
Pentlandfield
Roslin, Midlothian
EH25 9RE, UK

T +44(0) 131 440 5220
F +44(0) 131 448 1500

JETMOSPHERE™ FOR MARATHON SERIES INKJET MICROARRAYERS: USER MANUAL

INTRODUCTION

The JetMosphere™ cools, humidifies, dehumidifies and HEPA filters the air in Marathon Series inkjet microarrayers to provide consistent environmental conditions for microarray printing.

The JetMosphere™ will maintain a consistent printing environment between 15 and 25 °C (+/- 2 °C) with a maximum cooling capacity of 5 °C below the ambient temperature.

The JetMosphere™ will maintain consistent printing environment between 40 and 60 % relative humidity (+/- 5 %).

The JetMosphere™ will continuously circulate and HEPA filter the air within the arrayer.

JetMosphere™ for Marathon is available as standard on all Arrayjet Marathon, Super-Marathon, Ultra-Marathon I, and Ultra-Marathon II systems.

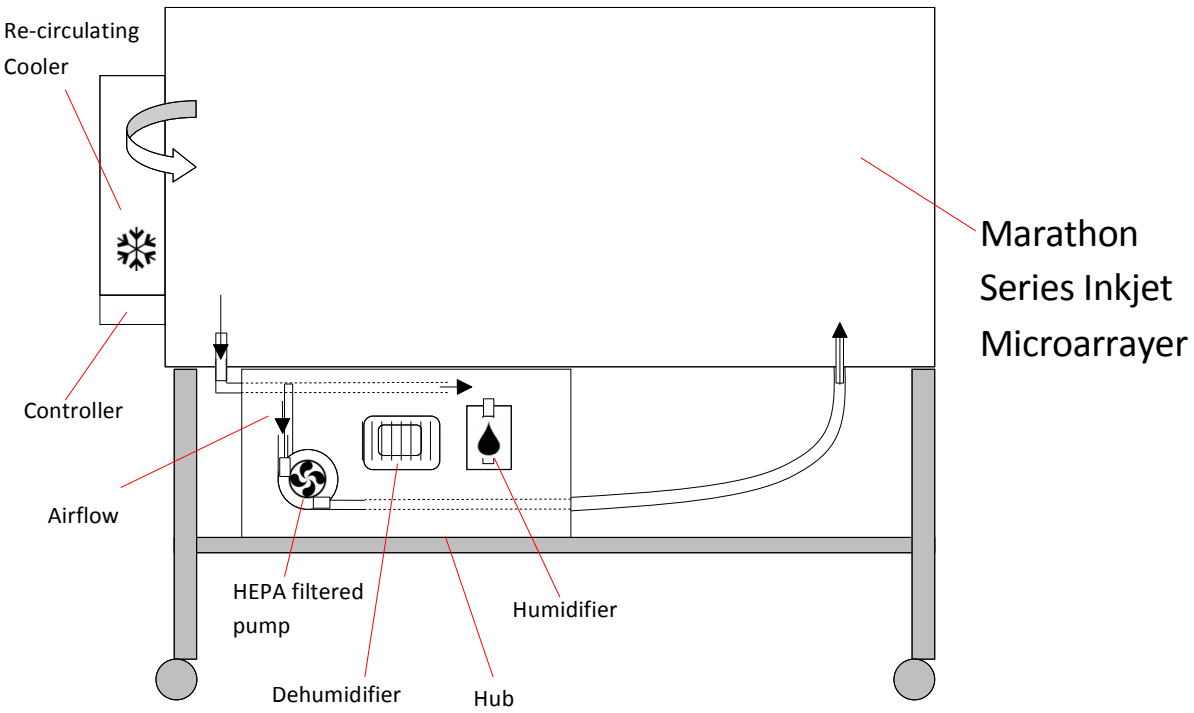
OPERATIONAL OVERVIEW

The JetMosphere™ is an automated system and only requires the user to fill the humidifier with deionised water and to empty the dehumidifier prior use.

The JetMosphere™ is turned on by a switch on the Controller mounted at the rear of the cooler, and operates independently from the microarrayer itself. The user selects the desired temperature and relative humidity and once these conditions have been achieved (5 – 30 minutes), the microplates and slides can be loaded. The JetMosphere™ will require 5 - 30 minutes to re-equilibrate after microplate and slide loading, or if the doors are opened during a pause in the printrun.

The Hub is a hermetic box housing the HEPA filtered pump, humidifier and dehumidifier; it should be locked shut during operation to ensure the correct functioning of JetMosphere™.

Figure 1. Schematic of a Marathon Series Inkjet Microarrayer with JetMosphere™.



TEMPERATURE CONTROL

The JetMosphere™ system is designed to lower the microarrayer temperature by up to 5 °C below ambient (room) temperature. Cooling of the microarrayer is achieved by a re-circulating cooler mounted on the left side panel, linked to a single temperature sensor housed within the air inlet of the cooler. The required temperature is set on the leftmost controller mounted at the base of the cooler which functions as follows;

1. To switch the refrigerator on press **UP** for more than 3 seconds (when pressing the button, the display shows **ON**).
2. To switch the refrigerator off press **UP** for more than 3 seconds (when pressing the button, the display shows **OFF**, alternating with the temperature measured by the set probe).
3. A temperature in the range 15 - 25 °C can be selected by pressing the ***SET*** for 1s, the set value will start flashing; increase or decrease the value using UP or DOWN; press SET to confirm the new value.

Figure 2. JetMosphere for Marathon Control Panel - Temperature Control.

HUMIDITY CONTROL

The relative humidity within the microarrayer is raised by the humidifier or lowered by the dehumidifier, which are located in the Hub. There is a humidity sensor mounted at the rear of the microarrayer. The relative humidity is set on the rightmost controller mounted at the base of the cooler which functions as follows;

Figure 3. JetMosphere for Marathon Control Panel - Humidification function.

1. A relative humidity in the range 40-60% is selected by pressing the left most buttin on the controller; **SP1** text will appear on the display.
2. Press the right most button; the current set-point is shown on the display; the value can be modified with the **UP** and **DOWN** arrows.
3. Press the right most button again to store any new values.
4. **SP2** can then be set in a similar manner.

The humidifier has a water tank which **must only be filled with de-ionised water** as there is a danger that salts in non-deionised water can be released as fine dust. The humidifier has a control knob which adjusts the intensity of humidification. This is pre-set at a value which should suffice in most conditions; if it is too low, the humidity in the microarrayer may take a long time to rise, and if it is too high the humidity may overshoot.

The dehumidifier has a container that collects the water removed from the air. It must be emptied before the start of every printrun in order to prevent overflow.

AIR CIRCULATION AND HEPA FILTRATION

The JetMosphere™ constantly recirculates the air in the arrayer; no user control is needed as the pump is on continuously when the JetMosphere™ is running.

Air is taken from the microarrayer via a pipe to the Hub; it then passes through a pump with a HEPA filter and is returned to the microarrayer. The constant recirculation of air ensures a consistent environment and that the air within the microarrayer is free of airborne dust particles.

The HEPA filter **should be renewed every 12 months** and should be inspected at 6 monthly service visits. **Depending on the amount of dust being filtered it may need replacing more regularly**.

QUALITY CONTROL

All Arrayjet products are tested extensively for quality and performance prior to being shipped and/or installed. Our microarrayers are put through a series of functional tests for reliability and reproducibility under normal laboratory operating conditions, which includes the operation of additional accessories such as JetMosphere™, JetGuard™ and our range of JetStar™ microarray slides. For more information about our QC procedures and criteria, please contact us via www.arrayjet.co.uk or support@arrayjet.co.uk.

TECHNICAL SUPPORT

At Arrayjet we are very proud of our record of high quality technical support and responsive customer service. In the event that you have questions concerning the performance of an Arrayjet product, please contact your local distributor or maintenance provider. If that is Arrayjet, please contact us via email at: support@arrayjet.co.uk, or call us on +44 (0) 131 440 5220 during normal business hours.

JETMOSPHERE™ SPECIFICATION

- JetMosphere™ for Marathon delivers an environment suitable for consistent microarray printing.
- JetMosphere™ will maintain a consistent printing environment between 15 and 25 °C (+/- 2 °C) with a maximum cooling capacity of 5 °C below the ambient temperature.
- JetMosphere™ will maintain a consistent printing environment between 40 and 60 % relative humidity (+/- 5 %) by active humidification and active dehumidification.
- JetMosphere™ for Marathon constantly re-circulates the air within the microarrayer through a HEPA filter to minimise airborne particulates.
- When the ambient temperature is below 23 °C, the temperature difference between ambient temperature and temperature inside the microarrayer will be reduced.
- JetMosphere™ is not intended for sample refrigeration. Arrayjet does, however, offer a refrigeration system (JetMosphere Max™) if required by the user.