

PRODUCT DATASHEET

ARIA

April 2024

GENERAL DESCRIPTION

The [Aria is an automated perfusion system](#) used to automate the delivery of up to 10 different fluids to one chip or perfusion chamber. The easy-to-use system can perform any perfusion protocol, and its compact design can interact with TTL enabled microscopy systems. The Aria was also created to enable “stop flow” conditions for studies requiring longer imaging times. It automates perfusion operations that have typically been performed manually, providing more reproducible results with minimum cross contamination.

BENEFITS AND FEATURES

- Saves time with an automated perfusion protocol
- Enables users to perform long-term perfusion studies
- Intuitive and easy-to-use: individual methods can be created, saved, and quickly recalled for a run
- Incubation steps and times are reproducible
- Reliable results: the number of manual operations is reduced, and the software automates most steps from calibration to cleaning
- Fits any experimental design
- Easy integration through our software and SDK
- Designed for microscopy room experiments: “dark mode” provides visibility to monitor the study progress.



TECHNOLOGY

The Aria can perform any perfusion protocol. Each solution can have a different flow rate and can be delivered for a specific volume or time. The Aria is a pressure-based perfusion system that utilizes Fluigent technology including pressure-based flow rate control

An internal on-off valve guarantees that the flow is stopped when a stop flow is desired for imaging or a zero-flow command is sent. An additional external valve is placed in the output line between the Aria and the chip or chamber. It directs the fluid either to the chip or to a waste position. It is useful to flush the tubing between two successive injections for automated calibration and priming.

The dedicated software is user-friendly and allows for projects to run without the experimenter present. In addition, an SDK library that collects all of the software functions is available for users that wish to integrate our liquid handling functions into their own software for OEM automation workflow. This allows users to have a single interface to actuate all components that are part of their fluorescence microscopy system (fluid management unit, imaging unit, heating devices, incubator, etc).

PERFORMANCE

STOP FLOW FUNCTION

An internal on-off valve prevents backflow during incubation steps. Rapid transition between injection and incubation is an advantage for microscopy studies.

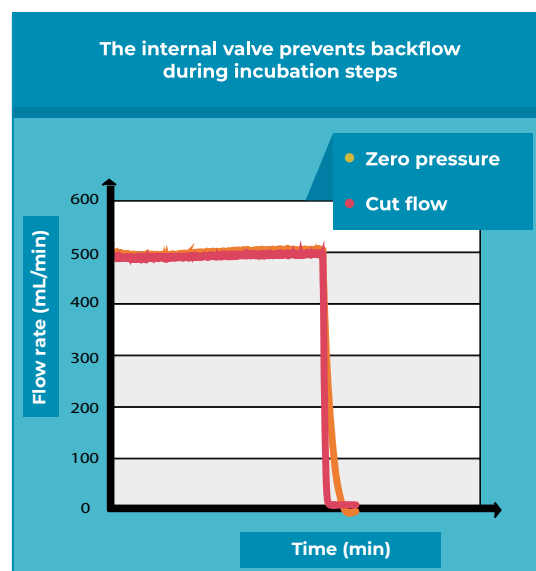
LONG TERM EXPERIMENT

Flow rate is constantly maintained for long-term studies. The delivery of water over 2 days is at 70 $\mu\text{L}/\text{min}$ is $\pm 4\%$.

FLOW RATE ACCURACY AND PRECISION

The flow control of the Aria has:

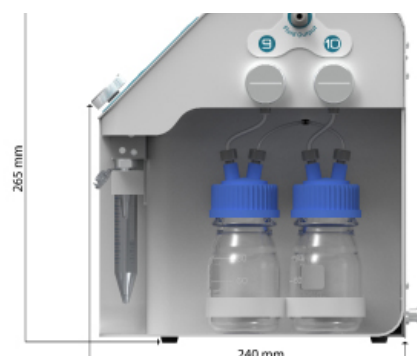
- accuracy of $\pm 5\%$ of the measured values above 40 $\mu\text{L}/\text{min}$.
- repeatability of $\pm 0,5\%$ of the measured value.



DATASHEET

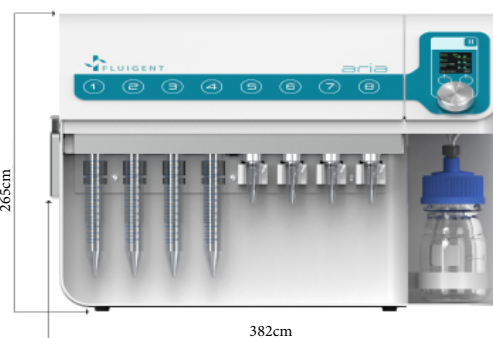
SPECIFICATION DATA

Flow Rate Control	Over the range of 40 $\mu\text{L}/\text{min}$ to 1 mL/min for water
Pressure Control of flow rate	to a maximum of 2 bar
Valves	Ten position switching valve Two position switching valve (2)
Fluid Reservoirs (8)	15 mL standard, 2 mL available
Flushing Solution Reservoir (2)	100 mL
Tubing	FEP with OD of 1/16 inch and ID of 250 μm
Wetted Surfaces	Polypropylene, FEP, Glass, PEEK
Compressed air source	Requires non-corrosive compressed air (lab line, gas cylinder, compressor or Fluigent FLPG)
PC Specifications	Windows 7 or higher
Software	Aria software and its SDK version



TECHNICAL DATA

Dimensions (Lxdxh)	382 mm x 240 mm x 265 mm
Weight	9 kg
Power supply voltage	24V DC
Max Energy consumption	160 W
Max Current requirement	6,67 A
Operating temperature	10°C - 40°C
Working fluid	Aqueous solutions only
Cleaning	With Tergazyme, Ethanol or Isopropanol and DI water

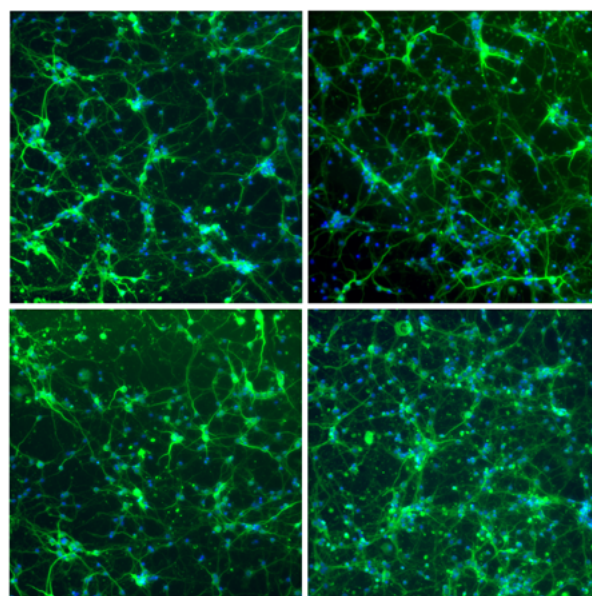


TARGET APPLICATIONS

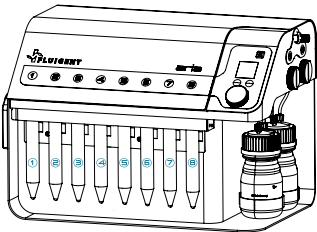
Aria is an all-inclusive, user-friendly system most suitable for spatial omics. It's an ideal solution for Immunolabeling, FISH, and DNA-paint experiments but can easily be adapted to other applications where controlled cellular perfusion or timed protocols are needed.

To ensure optimal conditions for cellular perfusion and long-term imaging workflows, it's essential to control the environmental parameters. Continuous perfusion of the medium ensures that cells are maintained in ideal physiological conditions, providing a constant supply of nutrients and a controlled pH environment. This process also helps prevent the accumulation of cell debris and maintains the location of regions of interest (ROI) under the microscope.

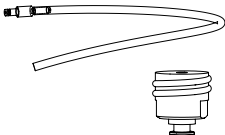
Here is an example of immunolabeling sensitive neuron cells inside microfluidic chips that have been obtained using Aria.



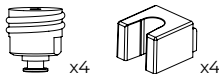
DETAILED CONTENTS
ARIA'S PACKAGE



Aria unit



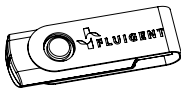
Inlet pressure tubing (2m)



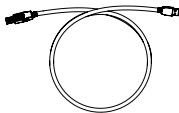
2 mL reservoir adaptor kit



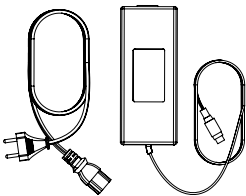
2mL adaptor wrench



USB Key (contains Aria software and its SDK)



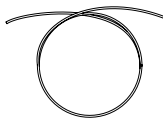
USB cable



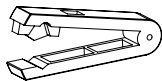
Power supply



2-Switch or M-Switch



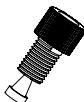
Fluidic outlet tubing (2m)



Tube cutter



2x F-120 connector



2-Switch: 6 XP-235 et 12 ferrules
M-Switch: 15 XP-235 et 30 ferrules

KITS

KIT ADAPTOR FOR 2ML	
P/N: ADP-KIT-AR	x4 2mL adaptor plastic : plastic and metal parts
ARIA TUBING REPLACEMENT KIT :	
P/N: CTQ-KIT-AR	x 10 reservoirs to selector valve
	x1 selector valve to flow unit to Flow Unit
	x1 Flow Unit to Stop Flow valve
	x1 Stop Flow to fluid Output