

PIPEJET TIP™

The PipeJet Tip is compatible to standard air displacement pipettes and combines nanoliter dispensing with microliter pipetting. Applied to a pipette it enables the aspiration of liquid volumes from 1 to 100 µl which can be aliquoted in the low nanoliter region with the high-precision PipeJet performance. A liquid filled tip can easily be inserted into the specific PipeJet Pipe Guide, thus droplets with adjustable volumes in the region from 10 to 60 nl can be dispensed in a non-contact manner to the desired target substrate.



P9 module with PipeJet Tip™

Thanks to the simple and robust working principle the dispensed volume is independent of viscosity and surface tension over a wide range. Even clogging of the tips is greatly prevented, also for particle filled liquids.

The PipeJet Tip has a dead volume of as low as 4 µl, which is the minimum volume required to operate. Short to mid term storage of the liquid can also be realized with the PipeJet Tip. The prefilled tip can be frozen and stored. After thawing the tip is ready again for either pipetting or nl-dispensing.

CUSTOMER SERVICE

The PipeJet technology requires minimum maintenance and in case of a service requirement BioFluidix offers worldwide customer support and spare part delivery.

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FEATURES

- Single droplet size 10 to 60 nl (adjustable)
- Typical dispensing frequency up to 100 Hz (depends on surface tension and viscosity)
- Storage/pipetting volume is approx. 100 µl
- Viscosity range 1-200 mPas for nanoliter dispensing
- Dispensing precision < 3 nl
- Dispensing accuracy < 10 nl (including tip to tip variance)
- Wide range of liquids can be dispensed
- USP class VI compliant material
- PipeJet Tip™ can be sterilized

APPLICATIONS

- Aliquoting and distributing of precious samples: Enzymes, proteins, PCR reagents, etc.
- Dispensing of living cells
- Dispensing of aggressive media which degrades tubing and valves of conventional systems
- Aspirating from and dispensing into 96, 384 and 1536 MTPs

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PIPEJET™ NANODISPENSER TECHNOLOGY



- Nanoliter liquid handling with maximum precision and flexibility
- Handling of precious samples at lowest volume
- Non-contact printing technology



PIPEJET™ TECHNOLOGY

The PipeJet technology enables the contact-free dispensing of small amounts of liquids in the range of a few nanoliter up to some microliter.

Key element of the technology is an elastic micro pipe with an inner diameter of a few hundred microns that is partially squeezed by a piezo stack actuator. Due to the implied volume displacement the liquid is ejected out of the orifice of the pipe. The PipeJet technology can be applied with different pipe diameters. Larger diameters enable to work in higher volume ranges. Dispensing pipes are available in different lengths and with hydrophobic coatings, which can be adapted to your needs.

CONTROL ELECTRONICS

The PipeJet dispensers are driven by a specific high voltage pulse, generated by the control electronics.

The cost-efficient Ra Control Electronics features a simple manual adjustment of the droplet velocity and is especially designed to drive the PipeJet P4.5 NanoDispenser. For high-precision volumetric dispensing the R5 Control Electronics allows for a software based adjustment of the dispensing parameters by the PipeJet Control Software.

It enables an easy droplet volume definition and the adaption of the dispensing performance to different liquid classes.

The implementation of these control functions into customers systems can be realized by provided DLL functions or serial communication.

Both electronics are available



SPECIFICATIONS

	Ra	R5
Max. frequency	50 Hz	400 Hz
Power supply	24 V DC, 1A	24 V DC, 1A
IO	Trigger in	Trigger in/out RS232/USB

in an ISO 41494 compatible system case for easy integration into measurement or automation setups. Alternatively, bare OEM PCB boards (100 x 100 mm) are available.

P9 NANODISPENSER KIT

Whether a single channel dispenser for a scientific experiment is needed or non-contact dispensing has to be integrated into an existing automation system, a production machine or a novel product:

The PipeJet NanoDispenser Kit contains all essentials required to get started with the PipeJet technology. With this kit the PipeJet nanoliter dispenser is ready for operation within minutes.

The kit includes a P9 dispenser with various pipe guides, the R5 control electronics and software as well as different dispensing pipes and a set of utilities to set up a single channel dispensing system.

PIPEJET™ PIPES

A unique benefit of the PipeJet technology, contrary to common non-contact dispensers, is the separation of the fluid path from the mechanical actuator.

The very durable PipeJet Pipes can be used for millions of dispensing cycles. However, they can be easily exchanged for reasons like:

prevention of contamination, maintenance, adjustment of the dispensing range, etc.

The low cost disposable dispensing elements make the PipeJet a versatile dispensing unit, which allows for cross-contamination free and clean liquid dispensing. PipeJet Pipes are available with 200 µm and 500 µm inner diameter defining different working ranges. Also various lengths and coating types are available.

PIPEJET™ DISPOSABLES AND PIPE GUIDES



PipeJet Pipes and PipeJet Tip



Pipe Guides for Dispensing Pipes and Tips

PIPEJET™ BENEFITS

APPLICATIONS

LIFE SCIENCE

- lateral flow assays
- microarrays
- micro well plates
- assay miniaturization
- microfluidic chips

INDUSTRY

- coating of medical products
- adhesive dispensing
- pharma production
- materials research
- semiconductors
- flux dispensing

PIPEJET TESTED LIQUIDS

- buffers & detergents
- DMSO & other solvents
- ethanol & methanol
- beads & living cells
- oils & adhesives
- strong bases & acids
- UV curable ink
- photoresist

PRECISION & ACCURACY

The PipeJet technology features excellent accuracy and reproducibility of less than 3 % CV for typical liquids at dosage volumes of 50 nl. Combined with the precise BioSpot® positioning stages, spots can be printed with a positioning accuracy of 50 µm.

ROBUST PERFORMANCE

Due to the simple concept and the sturdy materials the PipeJet™ dispensers are robust against clogging and all kinds of aggressive liquids.

LOW DEAD VOLUMES

Only a few microliters of liquid are required to operate a PipeJet dispenser. No precious liquid is wasted in supply tubing or by cleaning procedures.

SUITED FOR DIFFICULT LIQUIDS

The valveless PipeJet technology enables the dosage of cells, beads, particles and higher viscous liquids, proven in many application examples.

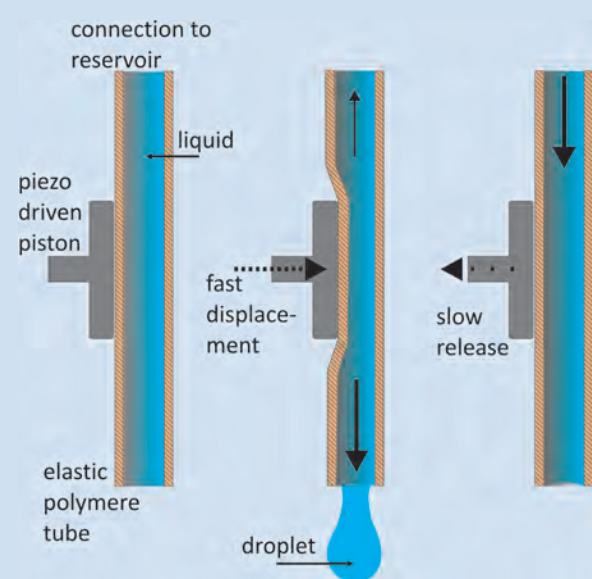
DISPOSABLE DISPENSING ELEMENTS

The PipeJet Pipes allow for an easy and low-cost exchange of all liquid-contaminated parts of the PipeJet dispenser.

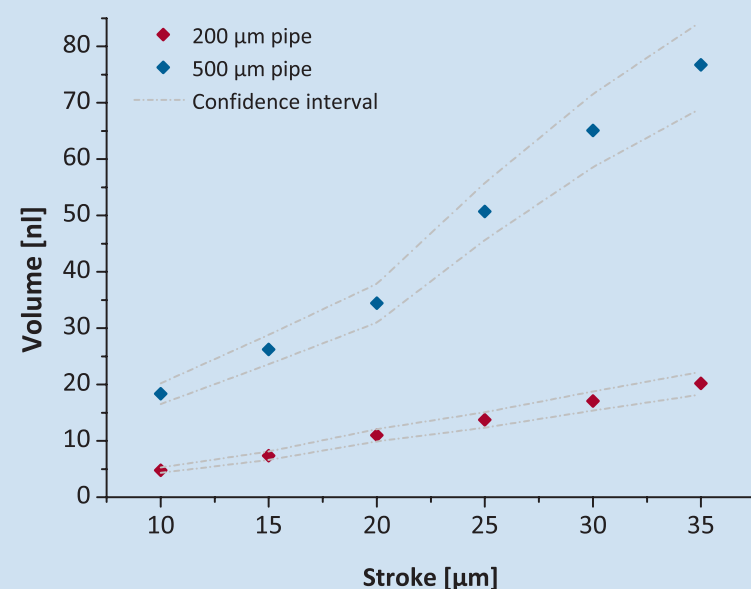
CERTIFIED MATERIALS

All parts being in contact with the liquids are chemically inert and made from USP class VI certified materials. PipeJet Pipes can be washed, plasma-treated and sterilized.

PIPEJET™ WORKING PRINCIPLE



ADJUSTABLE DROPLET VOLUME



Module type	P9 Tip	P 9 Pipe	P 4.5
Volume range	10–60 nl	5–60 nl	12 nl
Max. frequency	100 Hz*	100 Hz*	50 Hz*
Viscosity range	1–200 mPas*	0.5–500 mPas*	0.5–100 mPas*
Surface tension	30 mN/m–76 mN/m*	30 mN/m–76 mN/m*	30 mN/m–76 mN/m*
Precision / Accuracy	< 3 % / < 10 %	< 3 % / < 10 %	< 2 nl / < 4 nl
Pipe compatibility	PipeJet Tip	All types	500 µm pipes
Usage profile	Medium to high duty cycles	Medium to high duty cycles	Low duty cycles

* Depending on the liquid used

