

Piezorray™

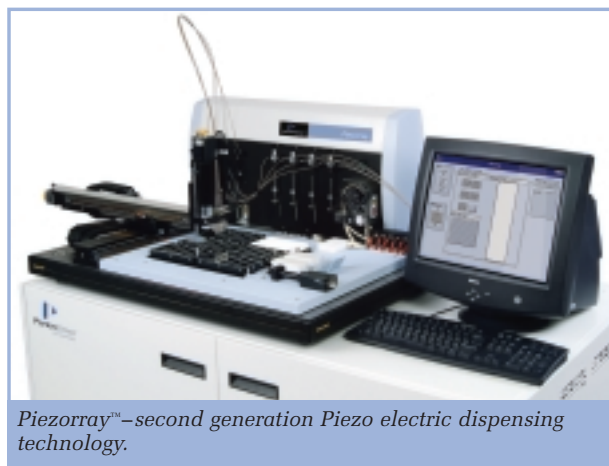
Flexible Non-contact Microarraying System

Standard Features

The Piezorray is a non-contact micro-dispensing system designed specifically for dispensing sub-nanoliter to nanoliter volumes to create dense arrays. Liquid volumes are precisely and accurately controlled by a patented piezoelectric tip technology that dispenses reproducible sub-nanoliter volume droplets. The instrument is extremely versatile, being able to dispense into and aspirate out of a number of standard plate formats, and dispense to a variety of porous and non-porous substrates for creating arrays. The Piezorray is controlled by an external computer.

Instrument Features

- **Computer Controlled Robotic System:** The PiezoTip™ dispenser assembly is securely mounted to an X-Y-Z robotic arm. The arm has 2 µm positioning resolution in X and Y motion with 25 µm accuracy and precision; and a 10 µm positioning resolution in Z motion with 20 µm accuracy and precision.
- **PiezoTip Dispensers:** The tip assembly contains four PiezoTip dispensers mounted at 9 mm spacing.
- **Non-Contact Dispensing:** The PiezoTip dispensers do not contact the surface to which the sample is dispensed, thus contamination potential is reduced and the risk of disrupting the target surface is eliminated. This allows dispensing to porous as well as non-porous substrates, e.g., membranes and slides.
- **Real Time Pressure Control:** Pressure is maintained during dispensing by small, bi-directional syringe pump adjustments. Each adjustment proportionally compensates for pressure changes in the tip associated with variations in liquid volume due to the tip motion and dispensing.
- **Deck Layout:** The deck assembly utilizes a high precision optical bench and provides a working platform that supports a combination of up to six microplate and/or slide holders to provide the flexibility to optimize assays. The optical bench also supports a washbowl, two reagent/buffer troughs, and a dispense verification camera.
- **Vacuum Assist Manifold:** A manifold is used to provide vacuum to any of the six deck positions to hold glass slides or any 1" x 3" flat substrate in place.
- **Washbowl:** The washbowl is designed to decrease carryover of the PiezoTip dispensers during normal aspirate-dispense cycles. External washing of the tips is accomplished by a peristaltic pump wash mechanism and high frequency ultrasonics. Wash water flows actively across the tips and drains out of the washbowl into the waste portion of the bowl. Internal washing is accomplished through syringe flushing and piezo element-based tip sonication (software selectable).



Piezorray™ – second generation Piezo electric dispensing technology.

- **Dispenser Verification:** A CCD camera is mounted to the deck assembly and provides the ability to visually verify drop formation and tip dispensing utilizing real-time on-screen display and the software GUI. The software utilities aid the user in optimizing the performance of the dispenser.
- **Precision:** Intra-tip dispensing precision is better than 2% CV and inter-tip dispensing precision is better than 5% CV (determined isotopically).

Software Features

- **Software Compatible with Integrated Microarray Lab:** Produces .GAL files that are compatible with many microarray analysis tools including Integrated Microarray Lab (www.microarraylab.com). Software is capable of importing .CSV and .TXT files for data tracking purposes.
- **All New Windows® XP-Based GUI:** Provides a very easy-to-use interface to setup arrays in the most customized manner. Users have the ability to customize assay and array setups.
- **Utilities:** Pre-defined routines for common tasks such as priming of the dispensers, dispense verification, and start-of-day procedures can easily be modified to suit individual needs.
- **Error Recovery:** Pre- and post-dispense checks using pressure control combined with error recovery routines allow correction of dispenser problems by means of washing the dispensers and reaspirating the sample.
- **Custom Mapping:** Customize the layout of arrays to meet specific individual needs.



Options

- **Positioning Camera:** A second camera mounted to the dispensers assembly registers the start-point of dispensing. This camera sights the dispenser head relative to the array when dispensing to predefined substrate microstructures, such as gel pads and microcapillaries.
- **384-well Thermal Cycling Plate Support:** A special adapter is available to provide proper reproducible positioning of flexible conical microplates used in thermal cyclers.
- **Helium Sparge Kit:** This kit contains all the parts necessary to sparge the system liquid with helium. It includes a regulator, flow meter, tubing, and bottle cap, check-valve and sparge stone. User must supply Ultra High Purity (UHP) 99.999% min. grade helium cylinder and two-stage high-purity regulator (secondary delivery pressure not to exceed 30 psi). For North America, an optional regulator kit with CGA 580 inlet fitting is available.
- **Temperature Control Manifold:** A manifold is available to distribute a recirculating fluid supply to the six deck positions. Connections and tubing are included. (The recirculating bath, controller and coolant pump are not included. Recirculation bath can be purchased through PerkinElmer.)
- **Environmental Enclosure:** This optional feature protects the Piezorray instrument from dust by enclosing it in a plastic hood and filtering (HEPA filtration) and ionizing the air.
- **Customer Maintenance Kit:** Customer maintenance kit contains all fluidic path replacement parts and includes four syringes, four valves, four replacement pressure transducers, and a complete set of replacement tubing. Replacement fuses are also provided with this kit.



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Physical Data

- **Dimensions**

Height:	32 in	(81 cm)
Width:	55 in	(140 cm)
Depth:	30 in	(76 cm)
- **Total Working Area (includes 30" width for the PC/monitor and assumes wash/waste bottles on the floor or shelf)**

Height:	32 in	(81 cm)
Width:	85 in	(216 cm)
Depth:	30 in	(76 cm)
- **Total Working Area with Optional Enclosure (includes 30" width for PC/monitor)**

Height*:	45 in	(114 cm)
Width:	85 in	(216 cm)
Depth:	36 in	(91 cm)

*45" high is required for enclosure front door vertical clearance.
- **Weight (approximate)**

Net Weight:	225 lb	(102 kg)
	Piezorray only (w/o ancillary components or enclosure)	
Shipping Weight:	325 lb	(148 kg)
	Piezorray only (w/o ancillary components or enclosure)	
- **Electrical Requirements**

100-130 Vac, 50-60 Hz: one (1) 15 Amp dedicated circuit or two (2) 15 Amp dedicated circuits if chiller is optioned.
200-250 Vac, 50-60 Hz: one (1) 10 Amp dedicated circuit or two (2) 10 Amp dedicated circuits if chiller is optioned.
- **Power Ratings**

Device	115 Vac	220 Vac
Piezorray	3.0A	1.5A
PC	3.0A	1.5A
PC monitor	1.6A	0.8A
Illuminator	3.0A	2.0A
Vacuum pump	1.6A	0.8A
Ultrasonic washbowl	0.8A	0.63A
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Subtotal	13.0A	7.25A
Chiller	12.0A	6.0A
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Total	25.0A	13.25A
- **Environmental Operating Requirements**

Temperature: 19–21° C (66–70° F) controlled
Relative Humidity: 30–40% controlled
Clean laboratory environment
(Clean room Class 10,000 or better is recommended.)


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