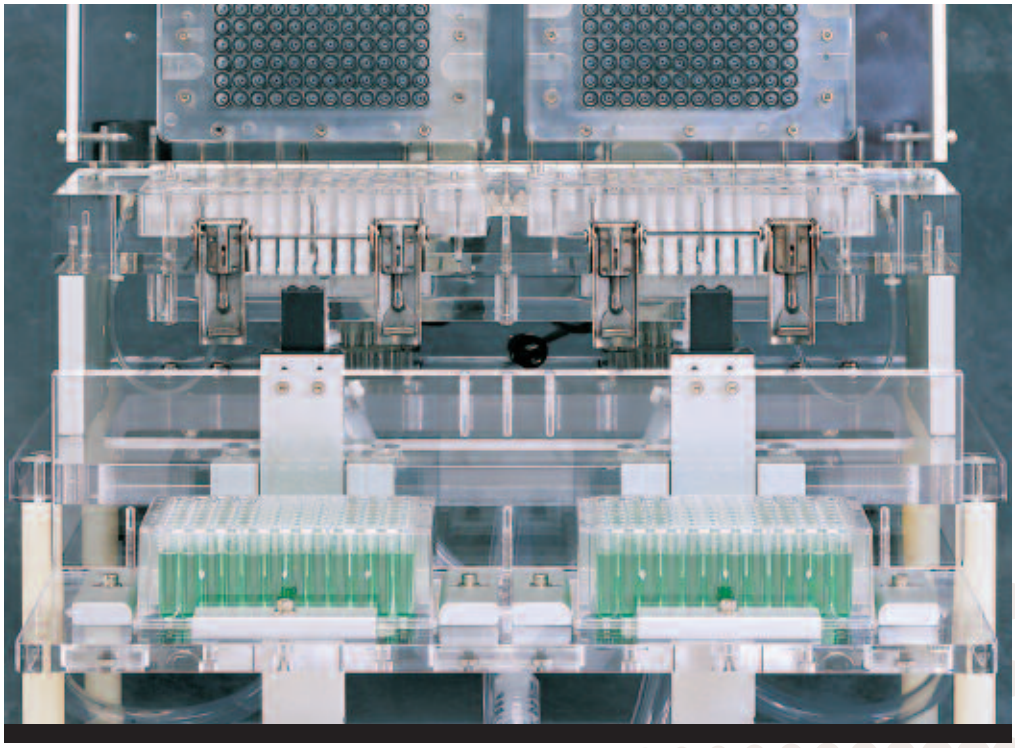
HARVESTING SYSTEMS

FOR DIRECT RADIOACTIVE READERS



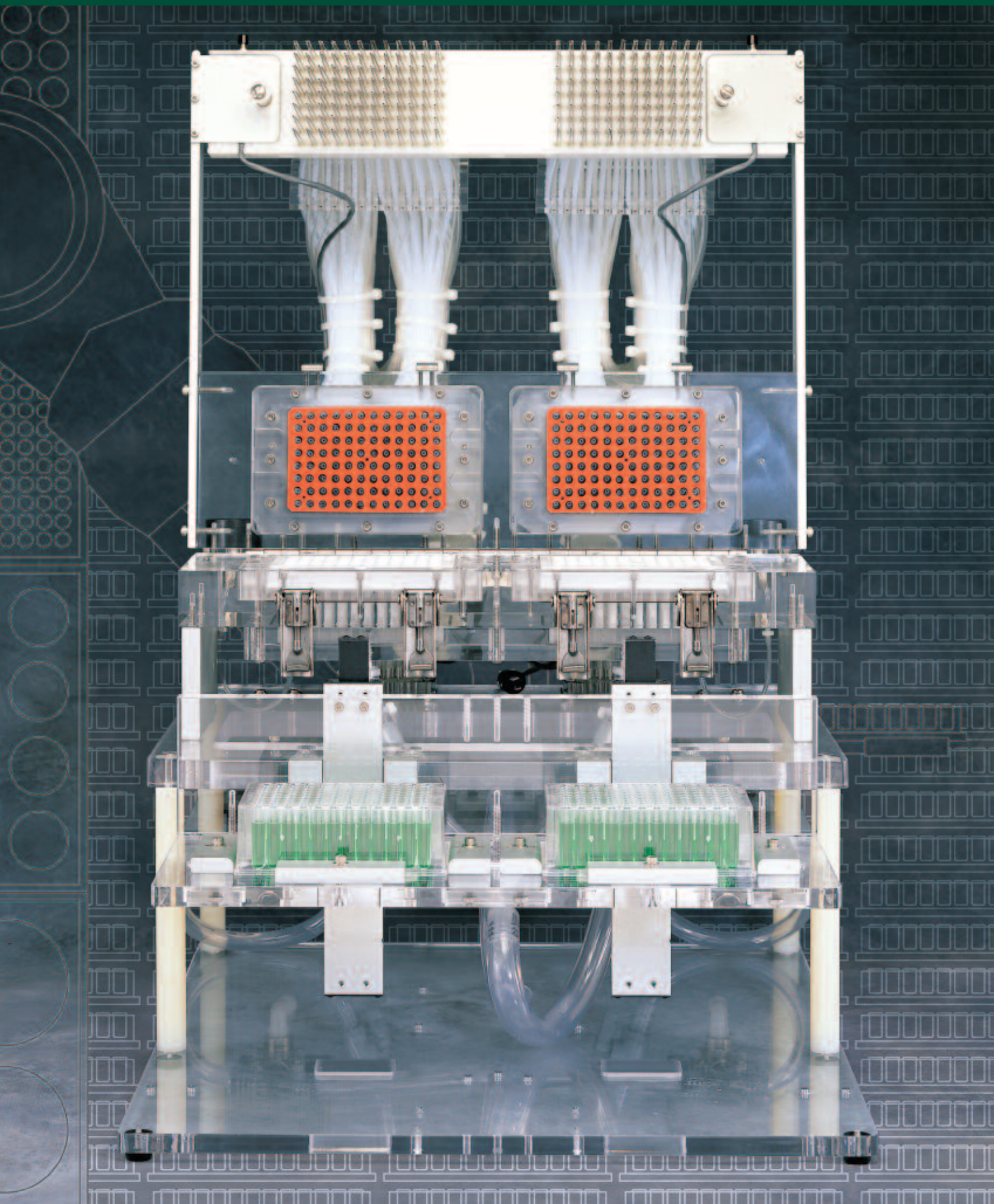
Fully-Automated Harvesters

Semi-Automated Harvesters

Harvester Accessories

BRANDEL

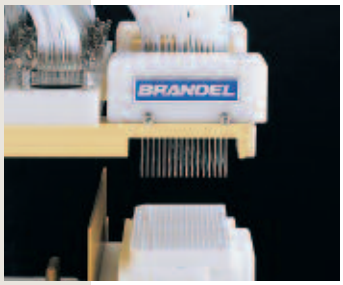
[HIGH-THROUGHPUT]^2



Fully-Automated Harvesting Systems

Harvesters for System Integration

Brandel's fully-automated harvesters bridge the gap between robotic sample preparation and counting procedures – and introduce the convenience, reliability, and versatility of Brandel harvesters to the robotic arena.



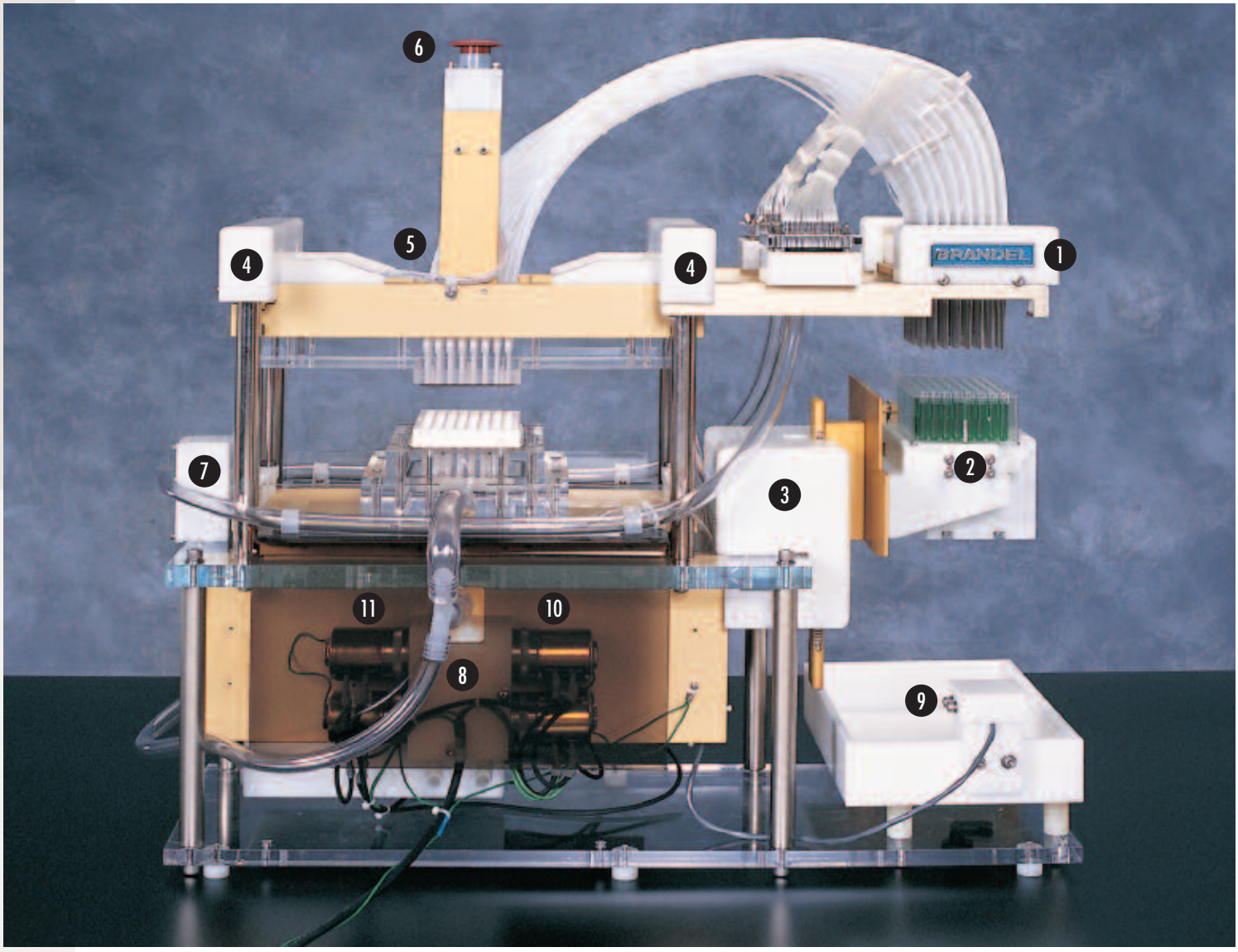
Engineered from the ground up for systems integration, these harvesters feature multiple access points and are compatible with most robotic arms. Operationally, your Brandel system will perform all aspiration, wash and collection cycles according to your pre-programmed protocols. Equipped with optional Auto-Fill/Auto-Drain and High-Capacity Plate Carousels, harvesters can run continuously and unattended.

Programming/Interface

Two-way communication between your arm's control system and the harvester's Programmable Controller enable the systems to work together. Harvesters can be programmed using the Remote Keypad or through your host computer using provided software. Once programmed, operation can be initiated and monitored by your arm's control system.

Sensors & Alarms

Sensors continuously monitor all critical stages of the harvesting cycle to ensure proper operation and verify that the Harvester is ready to execute the next sequence of events. Should a situation arise that would inhibit proper operation, an alarm is sounded and the Harvester is placed on standby. Sensors on the Auto-Fill and Auto-Drain Reservoirs monitor and maintain proper flow of media and filtrate; sensors on the optional Plate Carousel monitor it's operation.



ROBOTIC OPERATION

1. System arm loads filter plate into harvester.
2. System arm loads sample plate into harvesting tray.
3. Main programming system cues start of Harvester program.
4. Filter block closes and seals. Sample plate is raised into position for harvesting.
5. Harvester pre-wets filter plate or mat to enhance vacuum pressure.
6. Harvester proceeds through aspiration and wash cycles as programmed. Radioactive and non-radioactive waste solutions can be collected into separate reservoirs for disposal.
7. Sample plate is lowered from probe and filter block opens.
8. System arm removes filter plate from Harvester and places it into Plate Carousel (optional).
9. System arm removes sample plate from Harvester and places it in Plate Carousel (optional).
10. Arm selects the next sample plate and filter plate, and cycle repeats.

FULLY-AUTOMATED MODELS

96-SAMPLE SYSTEMS

9600-X	Harvests from (1) 96-sample plate to (1) 96-well filter plate or mat
9600-A	9600-X above, plus Auto-Fill/Drain with Alarm

192-SAMPLE SYSTEMS

96192-X	Harvests from (2) 96-sample plates to (2) 96-well filter plates or mats
96192-A	96192-X above, plus Auto-Fill/Drain with Alarm

384-SAMPLE SYSTEMS

96384-X	Harvests from (1) 384-sample plate to (4) 96-well filter plates or mats
96384-A	96384-X above, plus Auto-Fill/Drain with Alarm
96496-X	Harvests from (4) 96-sample plates to (4) 96-well filter plates or mats
96496-A	96496-X above, plus Auto-Fill/Drain with Alarm

INTEGRATION & OTHER ROBOTIC SYSTEMS

Brandel offers integration support for robotically controlled HTS Harvesting and Plate Sealing. Through Cytogration, Inc., Brandel also offers robotic Cell Culture Systems (Caco-2 and others). For details, visit brandel.com or cytogration.com, or call to discuss your specific requirements.

FULLY-AUTOMATED HARVESTER SENSORS

Key to harvester at left.

1. Probe Alignment Sensor
2. Plate Sensor
3. Tray Height Sensor
4. Plate Alignment Sensors
5. Vacuum Gauge
6. Manual All-Stop
7. Height Adjustment Control
8. Auto Hot/Cold & Purge Valve
9. Overflow Sensor
10. Tray Clamping Sensor
11. Vacuum Sensor

If integration into a fully robotic system is not needed, consider one of our semi-automated systems for use with your direct radioactive reader. Available for 24 96 and 192 samples, they're designed to accommodate most readers.

BRANDEL ADVANTAGE

After more than 30 years of ongoing refinement, Brandel Harvesters are the best in the world. Our proven design, operating efficiency and unmatched versatility offer production savings that quickly offset any differences in purchase price. Given our reputation for reliability, you'll enjoy those savings for years to come.

Brandel's semi-automated harvesters feature Teflon-tubing (optional on the 24) that minimizes adhesion of "sticky" substances to the insides of tubing and provides the lowest Cv of any harvester on the market.

Interchangeable Plate/Mat Inserts enable you to harvest to filter plates of different volumes and in some cases, filter mats – permitting one harvester to do the work of several. Interchangeable Harvesting Probes add further versatility and make it possible to adapt your Brandel to future needs.

Accessories

Semi-Automated Models

24-Sample, 4x6 Filter Matrix

M*R-24	Filters 24 samples in any configuration to a 4x6 filter plate or mat†

48-Sample, 4x12 Filter Matrix for Wallac/PerkinElmer Big Spot Reader

MLR-48	Filters 48 samples

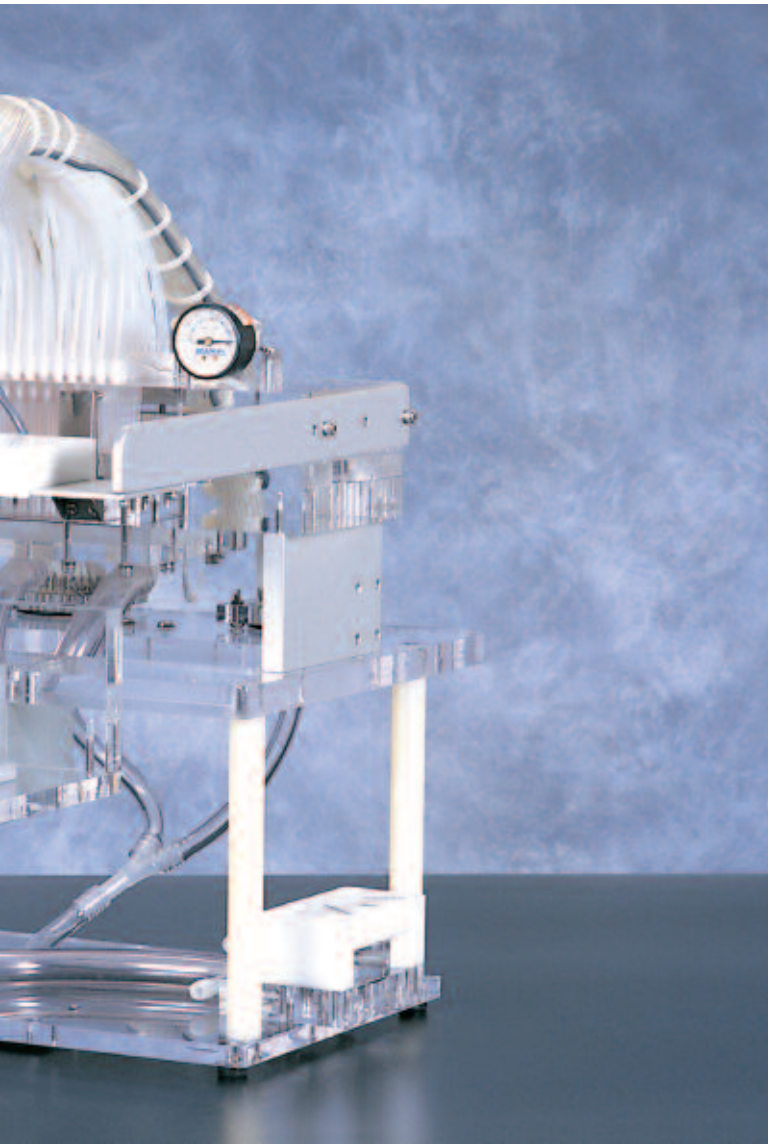
96-Sample, 6x16 Filter Matrix for Wallac/PerkinElmer Beta Plate Reader

MLR-96T	Filters 96 samples in any configuration to a 6x16 filter mat matrix

96 & 192-Sample, 8x12 Microtitre Format w/Interchangeable Probes

M*XR-96TI	Filters from (1) 96-sample plate to (1) 96-well filter mat
M*XRI-96TI	Filters from (1) 96-sample plate to (1) 96-well filter plate or mat†
M*XRI-192TI	Filters from (2) 96-sample plates to (2) 96-well filter plates or mats†

† Features removable Plate/Mat Inserts
* Indicates type of plate/mat: **W** Wallac **P** Packard **M** Millipore **O** Other



Industrial Duty Vacuum Pumps

Single-stage model for Semi-Automated 96-sample systems; two-stage model for all others. 110 and 220V models available.

Large Reservoir, Auto-Drain

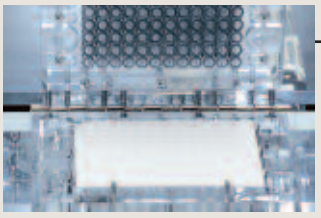
Auto-Drain includes filtrate pump and level sensors for automatic waste disposal. Models w/o Auto-Drain use manual valve. Available in 12 and 18 litre capacities.

Hi-Capacity Plate Carousel

With rotational indexing, programmable operation and a two-way communication interface, the Carousel is compatible with most robotic arms – and the perfect complement to your fully- or semi-automated Harvester. 160-plate capacity.

Micro-Dispensers

Dispenses precise, repeatable volumes (as little as 10 microlitres) to all samples in a variety of plate formats. Programmable, with memory. Available for buffer or cocktail.



Interchangeable Plate/Mat Inserts

Add the versatility of filtering to different plates or filter mats using a single harvester. Available for various filter plate brands and volumes.

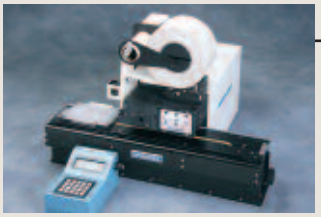


Plate Sealers

Cap Mat Sealer and Foil Sealer (shown) seal plates in seconds. Compatible with most chemicals including DMSO. RS-232 models available for robotic workstations.

Programmable Controller

Automates all aspiration and wash functions, including separation of hot/cold filtrates. Internal memory stores up to 10 programs of 256 lines each.

Filter Bottom Well Plates

Filter bottom well plates, filter mats and deep well sample plates also available.

Features/Specifications

Fully-Automated Harvesters

- Engineered specifically for system integration
- Two-way communication with robotic arm's control system
- Multiple points for robotic arm access
- Compatible with most robotic arms
- Harvests all samples in under 30 seconds
- Interchangeable Plate/Mat Inserts allow one harvester to accommodate different filter plates and/or mats
- Sensors monitor all critical stages of harvesting cycle
- Optional Auto-Fill/Auto Drain with sensors
- Programmable Controller with Remote Keypad, operating software and internal memory
- Your choice of one Interchangeable Harvesting Probe (additional probes available)
- Teflon aspiration tubing provides the lowest coefficient of variation (Cv) of any harvester
- Automatic Hot/Cold Valve for separate disposal of radioactive solutions
- Adjustable clamping pressure, software controlled
- Automatic Wash System; additional washes available
- Wash Media Pump with adjustable flow rate eliminates gravity feed, providing immediate and uniform washing of wells
- Flow adjustment for each individual well
- Self-priming Wash Manifold removes air bubbles from the system and ensures a uniform volume of wash solution will be delivered to every well. In conjunction with Wash Media Pump and Teflon aspiration tubing, provides the lowest coefficient of variation (Cv) of any harvester
- One large-capacity wash reservoir, 12 litre
- Includes two large-capacity collection reservoirs, 18 litre
- Removable stainless steel filter screens
- Vacuum Gauge indicates when vacuum is sufficient for harvesting
- Non-corrosive, Teflon-lined solenoids
- Non-corrosive, polished acrylic resists damage from harsh substances and allows full view of operations
- All harvesters are fully tested and calibrated
- Full factory support for information, filter plates, filter mats, parts, supplies & upgrades
- Choice of 110 or 220V models
- One-year parts & labor warranty

Semi-Automated Harvesters

- Harvests all samples in under 30 seconds
- Harvests from most any sample plate configuration
- Teflon aspiration tubing provides the lowest coefficient of variation (Cv) of any harvester
- Optional Programmable Controller automates aspiration and wash cycles
- Your choice of one Interchangeable Harvesting Probe (additional probes available)
- Interchangeable Plate/Mat Inserts allow one harvester to accommodate different filter plates and/or mats (except MLR-96T and M*XR-96T). Your choice of one Insert with harvester. Additional inserts available.
- Vacuum Gauge indicates when vacuum is sufficient for harvesting
- On/Off Vacuum Valve puts control of vacuum at the harvester, and permits purging of wash lines without drippage
- Adjustable clamping pressure, manual
- Wash Media Pump with adjustable flow rate eliminates gravity feed, providing immediate and uniform washing of wells
- Flow adjustment for each individual well
- Self-priming Wash Manifold removes air bubbles from the system and ensures a uniform volume of wash solution will be delivered to every well. In conjunction with Wash Media Pump and Teflon aspiration tubing, provides the lowest coefficient of variation (Cv) of any harvester
- Wash Media Bottle
- Reservoir for common collection of filtrate with quick-connect fittings for easy emptying
- Optional Large-Capacity Collection Reservoir with or without Auto-Drain available
- Harvesting Tray holds samples at eye level
- Removable stainless steel filter screens
- Locator pins for easy alignment of filter mat and positive sample identification
- Non-corrosive, Teflon-lined solenoid
- Non-corrosive, polished acrylic resists damage from harsh substances and allows full view of operations
- Low voltage control system (24V)
- All harvesters are fully tested and calibrated
- Full factory support for information, filter plates, filter mats, parts, supplies & upgrades
- Choice of 110 or 220V models
- Two-year parts & labor warranty

Micro Dispensers

- Models for dispensing either cocktail or buffers
- Adjustable, repeatable volumes
- Self-priming delivery manifold
- Teflon delivery tubing
- Remote Programmable Controller, featuring:
  - Keypad, with memory for 10 programs of up to 256 lines each
  - Digital speed control
  - RS-232 interface & software for host computer
  - Forward & reverse pump directions
- Choice of 110 or 220V models
- One-year parts & labor warranty

Plate Sealers

- Two models available: Cap Mat Sealer or Foil Sealer
- Accommodates most plate configurations and heights
- Compatible with most chemicals (including DMSO)
- Fully electrical – more reliable than air-operated systems
- Models with RS-232 interface for robotic workstations
- Choice of 110 or 220V models
- One-year parts & labor warranty

Plate Carousels

- Eight columns hold up to 20 microtitre plates each (larger capacities available on request)
- Completely programmable
- Two-way communication with your system computer through the RS-232 interface
- Controlled rotation bring each column to a common location for use with a robotic arm
- Selectable clockwise or counter-clockwise rotation
- Optical sensors provide accurate stopping positions
- Models for storing plates lengthwise or widthwise
- Models available for use with Biomek® systems
- Interchangeable columns allow storage of shallow- and deep-sample plates on the same Carousel
- Approximate size: 24" high, 24" diameter
- Custom configurations and sizes are available
- Can also be operated manually
- Choice of 110 or 220V models
- One-year parts & labor warranty

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