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EL404 *Microplate Autowasher*

OVERVIEW
With the advent of high volume immunoassay work, microplate washing has been pinpointed as the step that most affects assay success. The unique features, precision, and reliability of Bio-Tek's microprocessor-controlled EL404 Autowasher lowers background absorbance values and increases the signal to noise ratio of your assays better than any other 96-well microplate washer.

Bio-Tek's EL404 quiets operation, increases the ease of use, and adds new programming to further improve assay performance.

More Than an ELISA
The EL404 can accommodate a variety of assays beyond the standard immunoassays of ELISA, Fluorescence, and Chemiluminescence. The EL404 can wash cells and even can be used for removing reagent in cytotoxicity assays.

Cell Washing
The EL404 meets the special needs of cellular washing. Precise control of the vacuum force and the height of the aspiration tubes prevents the aspiration of cells in cellular assays. Pressure control feeds wash fluid at a low flow rate, preventing cell dislodging.

Cytotoxicity
Programmable residual levels enable the rapid removal of a portion of one reagent before adding another -- a useful feature for some cytotoxicity assays. This relieves the need to carefully position pipettes into microwells to avoid disturbing cell layers for reagent removal.

Robotics Friendly
Both the EL404 and EL404R contain RS232 interfaces for computer and robotic control. In addition, the EL404R features a rotated carrier and manifold to enable the robot to grasp the long sides of the microplate and feed the narrow end into the washer.

Easy to Use - Expanded Display
Bio-Tek has added a new 24 character display to show all wash parameters and provide clear prompting through the

SPECIFICATIONS
Microplates: Accommodates all 96-well microplates and strips

Speed: Washes/aspirates 96 wells in 6 seconds

Fluid Dispensing: Transducer controlled volumes, Pressure or gravity fed

Fill Volumes: 100 to 999 microliters

Wash Cycles: 1 to 9

Soak Times: 0 to 600 seconds

Programmable Aspiration Depth: 0 to 200 steps

Shaking: 5 to 15 cycles per second 0 to 30 seconds of duration

Protocol Names: 20 characters, user programmed

Accuracy: Well-to-well variation: ±5% at 350 ul

Aspiration Efficiency: 6 microliters maximum residual/well

Safety:
- Spill-over protection
- Dispense failure protection
- Vacuum check
- Microplate position check
- Drip pan
- Mirror to view washing
- Aerosol cover

Operating Functions:
- 10 wash programs
- 1 dispense program
- 1 aspirate program
- 4 maintenance programs including service mode
- 2 priming programs

programming process. Customize the expanded wash protocols with the actual assay name to eliminate any possibility of selecting the wrong wash procedure. The new priming routine ensures buffer purity without having to use a large amount of buffer to achieve adequate wash fluid concentration.

Shaking Improves Performance
In 1988, Bio-Tek introduced shaking to microplate washing. Since then, evidence has accumulated that shaking the microplate between wash cycles reduces the coefficients of variation (CVs) of sample replicates in some immunoassays.1 To further improve assay performance, Bio-Tek's EL404 washer adds variable shaking. But the new shaking programs are not the only way to reduce CVs. Bio-Tek's historically low residuals and use of variable dispensing pressure have improved CVs and also effectively reduced background absorbance levels.

10 WASH PROTOCOLS
Program up to 10 wash protocols, and store in nonvolatile memory for easy recall and use. Set up completely dedicated protocols for different assays, kits, or users. Each program contains:
- Dispense volume
- Wash cycles
- Soak time
- Microplate height adjustment
- Full or empty plate at end of washing
- Shaking time
- Shaking frequency
- Program name

Precision Dispensing and Aspiration
In immunoassay, each well should receive the same amount of wash fluid, at the same pressure, and have the same residual left. The EL404's manifold and plate carrier are constructed to ensure equal dispensing and aspiration. New, easily controlled aspiration tube depth ensures low residuals for all types of plates. The result is a maximum dispensing variation of only 5% at 350 ul and residuals of less than 6 microliters per well in flat-bottom plates.

Plate Shaking
Plate shaking can help break up the boundary layer that forms when fluid is added to a well. Dispense volumes and soak times are reduced, signal to noise ratios improved, and CVs lowered. New shaking frequencies include from 5 to 15 cycles per second for durations ranging from 0 to 30 seconds.

Dispense and Aspirate Programs
The dispense program dispenses reagents and performs quality control on the dispense function of wash. The aspiration program removes fluid at the user's convenience and provides quality control on the aspiration function of wash.

- 1 Rinse program
- Stop any operation

Power: 85 to 250 VAC, 50/60 Hz

Physical
Dimensions: 22" D x 10" W x 9.5" H (55.8cm x 25.4cm x 24.1cm)

Weight: 27 lbs (12.3 kg)

Regulatory:
- For *In vitro* diagnostic use
- ETL listed, meets U.L., CSA, IEC 1010 requirements
- CE Mark

FEATURES

- Shakes your microplates for better coefficients of variation (CVs)
- Automatic height adjustment
- Easy to use and program
- 10 customizable wash programs
- Preserve cell monolayers during washing
- Precise dispensing and aspiration
- Computer-control via RS232
- Safe to use -- aerosol cover standard
- Unique built-in maintenance programs
- EL404R RoboWasher can be easily controlled and loaded by robots

Unique Built-in Maintenance Programs
Automated maintenance programs have been incorporated to ensure that your EL404 will perform up to its specifications, day after day. These programs remove the worry of whether certain wells will be washed and the necessity of having to unclog tubes before washing.

Setup Flexibility
The EL404 accommodates a variety of laboratory environments and accessories. A pressure-vacuum module compacts the space usually required for two separate pumps. Separate pressure and vacuum systems and a gravity-feed system are available. Unlike other washers, the EL404 also accommodates labs already equipped with pumps, house vacuum systems, and reservoirs.

Safety
Adequate vacuum, pressure, and microplate presence are automatically monitored during operation. The probability of overflow due to instrument malfunction is greatly reduced.

A transparent dispense chamber allows confirmation that the washer is primed. The mirror underneath the microplate enables viewing of the complete wash process. The standard aerosol cover protects you and your laboratory environment.

Reliability
By increasing the ease of use, adding new diagnostics, and a unique service mode to fix possible malfunctions, the EL404 has an MTBF of over 2000 days.

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