

Radioactivity Detectors for Single Samples



Shell, Jr. 3000 Single Sample Gamma/Beta/X/ Positron Counter

Shell, Jr. 3000 is a small benchtop counter for the molecular biology lab. It counts DNA probes labeled with ^{32}P , ^{33}P , and ^{35}S , and proteins and peptides labeled with ^{125}I .

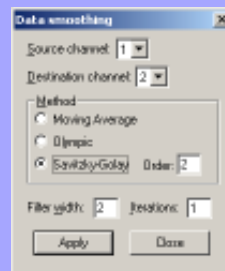
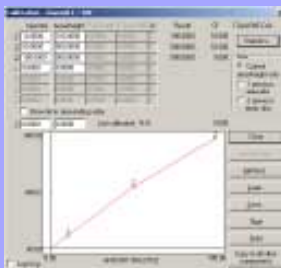
- **Compact, easy-to-use**
Provides counting at lab bench. Can be moved to the bench where needed. Can be used in the controlled space of a hood or other isotope "safe" working area.
- **Direct radiation detection in solid state detector**
Requires no scintillation cocktail, reduces or eliminates waste disposal
- **High count-rate capability**
Counts entire batches of labeled probes and proteins without saturating the detector. Eliminates pipeting and diluting steps.
- **Counts in all vial, tube, and filter formats**
Reduces solution transfers and pipeting. No special counting vials required.

Standard Applications

- **Measuring specific activity of radiolabeled DNA probes**
Molecular biology research labs, forensic labs (DNA fingerprinting), paternity testing, genetic screening.
- **Iodination procedures for separating protein fractions from labeling material and measuring specific activity of pooled labeled protein**
Protein labs, immunology (antibodies for radioimmunoassay)
- **Filter Precipitation Assays to measure purity of radiolabeled DNA probes**
Molecular biology research
- **Wipe tests to measure the contamination of areas where radioisotopes are used**
All labs using isotopes.

Accessory available for ^3H testing.

The microprocessor controlled system can be used either as a standalone version via analog output or PC control.





- DISPLAY:** 6 digit LED display with dimmer control providing a range of 0 - 999999 counts
- WELL:** 0.7" (1.7cm) diameter X 1.6" (3.9cm) Deep
- LINEARITY:** Reading within plus or minus 2% of true value
- TIMER:** Adjustment from 0 - 999 minutes with selectable divisions of X0.1, and X1
- METER 1:** 0 - 500,000 CPM range
- METER 2:** 0 - 500 CPM; 0 - 2.5 kV; BAT TEST
- MULTIPLIERS:** X1, X10, X100, X1000
- LINEARITY:** Reading within plus or minus 1% of true value with detector connected
- RESPONSE:** FAST (4 seconds) or SLOW (22 seconds) from 10% to 90% of final reading
- ZERO:** Push button to zero meter
- VOLTAGE:** Adjustable from 200 - 2500 volts (*will support 60 megohm scintillation loads*)
- THRESHOLD:** Voltage sensitive; adjustable from 1.0 - 10.0
- WINDOW:** Adjustable from 0 - 10.0 above threshold setting (*can be turned on or off*)
- Discriminator:** Adjustable from 2 - 100 mV at a threshold setting of 1.0
- RS-232:** 9 pin connector allowing for printer, or software interface and Analog output
- Shielding:** 15 mm or 50 mm



Accessory available for ³H testing.



Applications

Shell, Jr. 3000 is a single sample radioactivity counter for all gamma, positron, X and beta isotopes.

- Liquid sample counting
- Reference sample counting
- RIA-counting
- Solid sample counting
- Freeze-dried sample counting
- Homogenized sample counting
- Saturation thickness counting
- Waste counting

Background subtraction

Enhances the detectability of very low activities.

Bq (dpm) calculation

With the entry of individual values of efficiency can be performed automatically.

High count rates

For high count rates up to 200,000 cps the system is equipped with a dead time correction.

Print out

All parameters as well as results can be obtained via RS 232C port.

High energy Gamma & Positron detection (others available including Beta and X)

SCINTILLATOR: 2" (5.1 cm) diameter X 2" (5.1 cm) thick sodium iodide (NaI) scintillator

SENSITIVITY: Typically < 250 CPM

ENERGY RESPONSE: Energy dependent

TUBE: 2"(5.1cm) diameter magnetically shielded photomultiplier

VOLTAGE: Typically 500 - 1200 volts

DYNODE RESISTANCE: 60 megohm

Background:

2" x 2" NaI ¹²⁹I ~ 150 CPM

Efficiency:

2" x 2" NaI (4 π) ¹²⁹I ~ 70 %

1", 2" & 3" Scintillation Detectors available for all High energy Betas, Gammas and Positrons.

³²P, ¹²³I, ¹²⁵I, ¹³¹I, ⁹⁹Tc, ⁵⁵Cr, ⁵⁹Fe, ¹³⁷Cs, ¹⁸F, ¹¹C, ¹⁵O, etc.

Applications in P.E.T. Labs, Pharmaceutical Labs, Waste effluent monitoring, Radioactivity monitoring, Total activity measurement, Monitoring Radio-labelled compounds, etc.

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