

MANUAL LIQUID SCINTILLATION COUNTING SYSTEM

Model # SSS-22

FEATURES:

- HIGH SENSATIVITY H^3 , C^{14} , ALL BETA EMITTERS AND LOW ENERGY GAMMA EMITTERS
- DUAL PM TUBE DESIGN

APPLICATION: The **SSS-22** Manual Liquid Scintillation Counting System accurately quantitatively measure Carbon-14, Tritium and other radioactive labels.



Figure 1: SSS-22

SYSTEM DESCRIPTION:

Measuring Principle: The most sensitive method of detecting and quantitating beta emitting isotopes is to intimately mix the sample with liquid scintillation fluor and count each individual scintillation event with a dual photomultiplier coincidence counter. Followed by an energy analyzer which further selects the pulses and delivers the true signal. Hard copy printer is optional.

Detection cell optically coupled to two selected photomultiplier tubes which count in coincidence mode. Coincidence counting eliminates photo-cathode noise pulses, that are always present in any one-PM-tube system. Extremely good figure of merit for low energy betas such as H^3 and C^{14} are thus achieved.

GAMMA BACKGROUND RADIATION REJECTION FEATURES:

- Lead shielding around detector
- Energy Analyzing window rejects pulses with energies outside the window setting

COUNTING ASSEMBLY FEATURES:

- Excellent repeatability
- Fully light tight system
- Fail safe interlock to protect PM tubes

PM TUBE AND PRE-AMP NOISE IS ELIMINATED BY THESE FEATURES:

- Coincidence counting - dual PM Tubes
- High quality PM tubes and preamps
- Fully adjustable energy analyzer window rejects low energy pulse

Settable window can be set for any isotope. C^{14} window can be set for maximum response, or can be set to exclude Tritium.

READOUT IN PERCENT OR IN COUNTS

Preset count and preset time functions allow direct comparison of standard and sample: The **SSS-22** allows readout of sample activity directly as a percent of the standard, in counts/sec or counts/minute. Optionally, gamma ray counting is achieved by inserting and optically coupling an Na(Tl) scintillation well crystal between the PM tubes.

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\$Revision: 1.3 \$

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DATA ANALYSIS AND PRESENTATION

Scintillation counts which are detected simultaneously by both PM tubes are processed by a fully adjustable single channel analyzer which is centered on the energy peak of the isotope being measured. This deletes both higher energy pulses from background radiation and lower energy counts from the PM tube or circuit noise. The pulses are then fed to a digital scaler and **Optional** digital printer. (Thus allows long count times for measurement of very minute samples as well as completely elimination artifacts caused by ratemeter time constants.) Built-in RS-232 serial input of most computers. **Optional** Win-wedge data logging software.

SPECIFICATIONS:

Tritium Efficiency:	In excess of 60% for all systems.
C-14 Efficiency:	Typically 90%.
For Dual Channel System:	C ¹⁴ Efficiency: 15% when H ³ window is set for 50% H ³ efficiency.
Count Times:	1 sec thru 99,999 sec, in 1 sec increments.
Voltage:	0-2000 Volts - 2 fully independant HV supplies, individually settable.
Readout:	Digital - 5 digit plus overflow.
Power:	110VAC, 60 Hz (220V 50 Hz Optional).
Dimensions:	Electronics console 21"W x 18" x 11"H. Detector enclosure 18" x 6" x 6".
Weight:	45lbs.
Shipping Weight:	65lbs.
Sample Size:	Accepts standard Liquid Scintillation vials up to 1.1" dia. x 2 1/2"H.
Scintillation Fluors:	Accepts most scintillation fluors.
Options:	Digital Printer Model MPM-5. Gamma Well Counter Crystal, NaI(Tl).

Calibrated Sources: Set of 3 Calibrated standards, C¹⁴, H³ and background, all unquenched in sealed vials.



Detector for **SSS-22**

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