

PORTABLE LIQUID SCINTILLATION COUNTING SYSTEM

Model Series - SSS-22

SSS-12P-1 - SSS-22P – SSS-22-MCA – SSS-22-PAL SSS-22-PAL-ID - SSS-22-LR

FEATURES:

- MEASURES ALL ALPHA - BETA EMITTERS AND LOW ENERGY GAMMA EMITTERS – INCLUDING
 - TRITIUM, CARBON-14, SULPHUR-35, RADON
- ALPHA / BETA SEPARATION
- TRITIUM ULTRA LOW (**SSS-22-LR**)
- **SSS-22-MCA** INCLUDES GAMMA ISOTOPE IDENTIFIER
- DUAL PM TUBE DESIGN FOR COINCIDENCE VERIFICATION
- SSS-12P-1 – SINGLE SAMPLE HOLDER
- SSS-22P – THREE SAMPLE HOLDER
- SETTABLE WINDOW CAN BE SET FOR ANY ISOTOPE
- DIVERSE SAMPLE TYPE: WATER, FOOD, SOIL, FABRIC, ETC.
- ALL IN ONE UNIT– (**SSS-22-PAL**) WITH MCA (**SSS-22PAL-ID**)
- **R-232** PC INTERFACE



PRS-7-DSC
Electronics SSS-22P & LR-



SSS-22PAL
Suitcase Version
ALL-IN-ONE



PRS-7
Electronics SSS-12P-1



SSS-12P-1

APPLICATION:

A Liquid Scintillation Counting System is useful for measurement of radionuclides in many materials including food, soil, water, blood, etc.

The **SSS-12P-1 & SSS-22P** Manual Liquid Scintillation Counting Systems accurately quantitatively measures Carbon-14 and most other radioactive materials.

The **SSS-22P** also measures Tritium & is exceptional for measuring low levels of Tritium, C-14, S-35, Radon. **SSS-22-LR** for Ultra Low-Level Tritium detection.

SYSTEM DESCRIPTION:

Measuring Principal: 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 photomultiplier counter.

Alpha / Beta Separation.

Count Verification for Tritium.

An Energy Analyzer further selects the pulses and delivers the true signal.

A Detection cell is optically coupled to selected photomultiplier tubes.

SSS-12P-1 has a **1 Vial Capacity – 1 PM Tube**.

SSS-22P has a **3 Vial Capacity** providing faster thru-put and easy comparison of sample to calibration standard or to background – **2 PM Tubes**

SSS-22PAL has a **3 Vial Capacity** as does the SSS-22P providing faster thru-put and easy comparison of sample to calibration standard or to background. It is an **ALL-IN-ONE** SSS-22P contained within a suitcase with electronics, detectors, and sample holders for your convenience. With MCA Isotope Identifier **SSS-22PAL-ID**.

A User Manual is provided.



TECHNICAL ASSOCIATES
OVERHOFF TECHNOLOGY

7051 Eton Ave., Canoga Park, CA 91303
818-883-7043 (Phone) 818-883-6103 (Fax)

sales@usnuclearcorp.com

WWW.TECH-ASSOCIATES.COM

Divisions of  US NUCLEAR CORP
Ticker UCLE

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GAMMA BACKGROUND RADIATION REJECTION FEATURES:

- Energy analyzer window rejects pulses with energies outside the window setting
- Optional Lead Shielding around detector.

COUNTING ASSEMBLY FEATURES:

- Excellent repeatability
- Fully light tight system
- Fail safe interlock to protect PM tubes
- High transmission optical coupling to PM tube

PM TUBE & PRE-AMP NOISE ELIMINATION FEATURES:

- Coincidence Verification with High quality Dual PM tubes and preamps.
- Fully adjustable energy analyzer window rejects low energy pulses.
- **SSS-12P-1:** 1 Vial Capacity – 1 PM Tube.
- **SSS-22P:** 3 Vial capacity for faster thru-put and easy comparison of sample to calibration standard or to the background – 2 PM Tubes
- **SSS-22P:** 3 Vial capacity provides less wait time for dark adaption of phosphor.

DATA ANALYSIS & PRESENTATION:

- Scintillation counts detected by 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 feed to a digital scaler and optional digital printer.
- This process allows long count times for measurement of very minute samples.
- USB interface to computers or data stations.

SPECIFICATIONS:

H-3 Gross Efficiency:	>50% Gross, Coincidence efficiency >10% Verified.
H-3 Gross Efficiency:	>20% Gross, Coincidence efficiency >10% Verified (SSS-22-LR)
H-3 Sensitivity:	20,000pCi/l in 30 minutes; Below 10,000 pCi/l in 3 hours (SSS-22-LR)
Count Times:	1 sec. thru 99 sec. (1 sec. increments), and 1 min. thru 99 min. (in 1 min. increments).
Voltage:	0-1500 Volts - fully user settable.
Readout:	Digital - 6 digit LCD, (LED optional).
Outputs:	Standard: Serial pulse output and R-232.
Power:	Rechargeable Lithium batteries and AC adapter
Sample Size:	Accepts standard Liquid Scintillation vials 20-25 ml.
SSS-22 PAL Case:	Weather-tight NEMA rated tough, durable, lightweight. A “tongue-in-groove” continuous O”-ring system makes the case water, moisture, and dust tight. Plus a low profile pressure release valve.
OPTIONAL:	SSS-22P: Accepts 6-7 ml vials with Optional adapter.
Scintillation Fluors:	Accepts most scintillation fluors. Perkin-Elmer Ultima Gold-LLT is recommended for H-3 counting



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MODEL SUBASSEMBLY	SSS-12P-1 DETECTORS	SSS-12P-1 SSS-22P SSS-22-LR ELECTRONICS	SSS-22P SSS-22-LR DETECTORS	SSS-22-PAL ALL-IN-ONE (Includes Electronics)
MODEL	DT-S-12P	PRS-7-DSC	DT-S-22P DT-S-22-LR	SEE SSS-22P
Case Dimensions	18" L x 7" W x 7"H	10" L x 7" W x 7"H includes handle	18" L x 14" W x 7"H	22" L x 16" W x 7"H
Weight	3.6 Kg (8 lbs)	3 Kg (7 lbs) includes batteries	6.8 Kg (15 lbs)	10 Kg (22 lbs)
		PRS-7		
Case Dimensions		10" L x 4.1" W x 7"H includes handle	18" L x 14" W x 7"H	22" L x 16" W x 7"H
Weight		2.5 Kg (5 lbs) includes batteries	6.8 Kg (15 lbs)	10 Kg (22 lbs)
# PM Tubes	1		2	2
# Amplifiers		2		2
Coincidence Counting		Yes		Yes
Detected Emitters – Alpha-Beta PLUS	H-3, C-14, S-35	H-3, C-14, S-35	H-3, C-14, S-35	H-3, C-14, S-35
Capacity	1 Vial		3 Vials	3 Vials

PRS-7 & PRS-7-DSC

- SINGLE CHANNEL ANALYZER
- DETECTS: ALPHA, BETA, GAMMA, X-RAY, TRITIUM, POSITRON, MESON, COSMIC RAYS – DEPENDING ON DETECTOR SELECTED
- VERSATILE AC & RECHARGEABLE BATTERY
- THREE PRESETTABLE WINDOW POSITIONS
- SWITCH SELECTABLE
- SIX DECADES
- CRYSTAL CONTROLLED
- SPLASH PROOF
- IP65

PRS-7-DSC

- DUAL SINGLE CHANNEL ANALYZER
- 2 INDEPENDENT DETECTOR INPUTS
- COINCIDENCE CIRCUIT SIGNALS IF BOTH DETECTORS SEE A PULSE AT THE SAME TIME



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GAMMA DETECTION:

Gamma emitter content is measured using a Scintillation detector with the MCA (Multi Channel Analyzer) with greater than 512 channels with a user settable energy range & readout. For example the MCA can be set to show Gamma peaks from 15 KeV to 3.5 MeV.

Isotope Identification System –

TA SMART-PEAK TM

Software detects even low Gamma concentrations. The isotope identifier specifies & displays radioactive nuclides.

MCA ELECTRONIC SYSTEM DESCRIPTION:

(Microprocessor based)

Electronics: High Quality Windows PC including:

Operating Software: TAcquire™ custom software plus Excel Spread Sheet

Radionuclide Library: Radionuclide Library Tailored To Customer Request

Data: Stores Data to MS ACCESS Database. Data Files are Importable into Excel

CPU with Data Acquisition: High Resolution COLOR display, Audio

Data Ports: USB & Ethernet

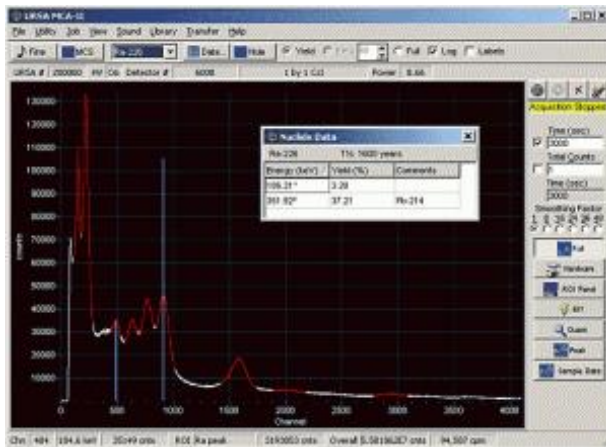
USB-Flash Drive: For data storage – 10 years storage

Terabyte hard drive. Stores programs & 20 YEAR'S of Detailed DATA plus alarm record.

Power: 110 VAC - 60 Hz, 220 VAC optional 50/60 Hz Internal Battery Backup, Fail Safe

OPTIONS:

- Set of 3 calibrated liquid standards, H-3, C-14 and S-35. User must mix TA solutions with liquid scintillant.
- Optional Interfaces and Outputs: Clear instructions with all interfaces.
- Data logging software, Model # ORO-22P
- Data acquisition interface and cable with driver, Model # DAQ-3
- Increase from 3 to 6 sample capacity
- MCA Electronics for Gamma Isotope Identification
- Printer



Sample Screen Shot
MCA Gamma Isotope Identifier



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TA LIQUID SCINTILLATION COUNT RANGE				
	COUNT TIME	SSS-12P-1 pCi/L	SSS-22P pCi/L	MAX KEV BETA
TRITIUM	2 min	N/A	10,000	18.6
	10 min		5,0000	
	60 min		2,000	
C-14	2 min	2,500	1,250	156
	10 min	1,250	625	
	60 min	500	250	
S-35	2 min	2,500	1,250	167
	10 min	1,250	625	
	60 min	500	250	



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