

# PORTABLE LIQUID SCINTILLATION COUNTING SYSTEM

## 便携式液体闪烁体计数系统

Model Series - SSS-12P - SSS-22P – SSS-22-PAL– SSS-22-MCA

### FEATURES:特点

- MEASURES ALL ALPHA - BETA EMITTERS AND LOW ENERGY GAMMA EMITTERS – INCLUDING
- 测量全部  $\alpha$   $\beta$  发射物和低能  $\gamma$  发射物-包括
  - TRITIUM, CARBON-14, & SULPHUR-35
  - 氚, C-14, 硫-35
- ALPHA / BETA SEPARATION
- $\alpha$  /  $\beta$  识别功能
- DUAL PM TUBE DESIGN FOR COINCIDENCE VERIFICATION
- 双PM管设计用于符合性验证
- SSS-12P-1 – SINGLE SAMPLE HOLDER
- SSS-12P-1-单腔样品托
- SSS-22P – THREE-SAMPLE HOLDER
- SSS-22P-3腔样品托
- SETTABLE WINDOW CAN BE SET FOR ANY ISOTOPE
- 可预设窗可以设定为任何核素
- SAMPLE TYPE: WATER, FOOD, SOIL, FABRIC, ETC.
- 样品种类: 水, 食物, 土壤, 纤维等
- ALL IN ONE UNIT– **SSS-22-PAL**
- 一体机- **SSS-22-PAL**
- **R-232** PC INTERFACE
- **R-232** 电脑接口
- **OPTIONAL** - HARD COPY PRINTER
- 选购-打印机



**LAM-10DSC**  
Electronics  
For the SSS-12P/22P



**SSS-22PAL**  
Suitcase Version  
ALL-IN-ONE

### APPLICATION:应用

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

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

The **SSS-22P also measures** tritium & Exceptional for measuring low levels of Tritium, C-14, & S-35.

液闪计数系统适用于测量包括食物, 土壤, 水, 血液等



**SSS-12P-1**



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辐射核素。

**SSS-12P & SSS-22P** 手动液体闪烁系统精确测量C-14及大多数其它辐射物，**SSS-22P**也测量氚，尤其测量低浓度氚、C-14, & S-35



LAM-10D

Electronics SSS-12P-1

### SYSTEM DESCRIPTION: 系统描述

**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.

**测量原理:** 最灵敏的检测并量化 $\beta$ 核素方法是将样品与液体闪烁体充分混合并用光电倍增管计数每个闪烁事件。

**Alpha / Beta Separation.**

$\alpha$  /  $\beta$  识别功能

**Count Verification** for Tritium.

氚测量计数核实功能

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

能量分析仪进一步选择脉冲并传递真实信号

**A Detection cell** is optically coupled to selected photomultiplier tubes.

检测室与光电倍增管光学耦合

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

**SSS-12P**容量为1瓶-1个PM管

**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-22P**有3瓶容量，提供更高通量，容易与标定标准或本底比较-2个光电倍增管。

**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.

**SSS-22PAL** 有3瓶容量，因为更高通量，所以容易与标定标准或本底比较，此一体系统带手提箱外箱，包括电子学、探头和样品盒，使用方便。

**A User Manual is provided.**

提供用户手册

### GAMMA BACKGROUND RADIATION

#### REJECTION FEATURES: 伽马本底辐射抑制

- Energy analyzer window rejects pulses with energies outside the window setting  
能量分析窗抑制设定值以外的能量脉冲
- Optional Lead Shielding around detector.



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可选择探头周围带铅屏蔽

### COUNTING ASSEMBLY FEATURES:

#### 计数组件特点:

- Excellent repeatability  
出色的重复性
- Fully light tight system  
整体轻量
- Fail safe interlock to protect PM tubes  
故障安全联锁装置以保护PM管
- High transmission optical coupling to PM tube  
高透光性PM管

### PM TUBE & PRE-AMP NOISE ELIMINATION FEATURES:

#### PM管&前置放大器噪音清除功能:

- Coincidence Verification with High quality Dual PM tubes and preamps.  
高质量双PM管和前置放大器进行符合测试
- Fully adjustable energy analyzer window rejects low energy pulses.  
完全可调整能量窗排除低能脉冲
- **SSS-12P-1:** 1 Vial Capacity-1 PM Tube.  
1瓶样品容量-1个光电倍增管
- **SSS-22P:** 3 Vial capacity for faster thru-put and easy comparison sample to calibration sample or to background– 2 PM Tubes.  
3瓶容量, 高通量容易与标定标准或本底比较-2个光电倍增管
- **SSS-22P:** 3 Vial capacity provides less wait time for dark adaption of phosphor.  
3瓶容量减少磷暗适应等待时间

### DATA ANALYSIS & PRESENTATION: 数据分析&呈现

- 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.  
PM管探测到的闪烁计数经过置于被测核素能量峰值中心的可调整单道分析仪处理, 这样本底辐射产生的较高能量脉冲和PM管或电路噪音产生的低能脉冲均被清除, 脉冲反馈到数字测量仪和选购的数字打印机。
- This process allows long count times for measurement of very minute samples.  
此处理允许对每一份样品测量长时间计数。
- USB interface to computers or data stations.  
USB电脑或数据库接口



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### SPECIFICATIONS: 规格

<b>H-3 Gross Efficiency:</b>	>50% Gross, Coincidence efficiency >10% Verified.
H-3总效率	>50%，符合效率>10%
<b>Count Times:</b>	1 sec. thru 99 sec. (1 sec. increments), and 1 min. thru 99 min. (in 1 min. increments).
计数时间:	1-99秒（1秒递增），1-99分钟（1分钟递增）
<b>Voltage:</b>	0-1500 Volts - fully user settable.
电压:	0-1500 V-完全用户设定
<b>Readout:</b>	Digital - 6 digit LCD, (LED optional).
读数:	6位数LCD（可选LED）
<b>Outputs:</b>	Standard: Serial pulse output and R-232.
输出:	标准: 串口脉冲输出, R-232
<b>Power:</b>	Rechargeable Lithium batteries and AC adapter
电源	可充电锂电池和AC适配器
<b>Sample Size:</b>	Accepts standard Liquid Scintillation vials 20-25 ml.
样品尺寸:	可接受标准20-25 ml标准液闪瓶
<b>SSS-22 PAL Case:</b>	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.
<b>SSS-22 外箱:</b>	防潮符合NEMA标准结实耐用轻量外箱
<b>OPTIONAL:</b>	<b>SSS-22P:</b> Accepts 6-7 ml vials with <b>Optional</b> adapter.
选购:	SSS-22P: 可选带适配器的6-7ml小瓶
<b>Scintillation Fluors:</b>	Accepts most scintillation fluors. Perkin-Elmer Ultima Gold-LLT is recommended for H-3 counting
闪烁氟	接受几乎任何闪烁氟，监测H-3推荐“Perkin-Elmer Ultima Gold-LLT”。

MODEL SUBASSEMBLY	SSS-12P-1 DETECTORS	SSS-22P ELECTRONICS	SSS-22P DETECTORS	SSS-22-PAL ALL-IN-ONE (Includes Electronics)
MODEL	DT-S-12P	LAM-10DSC	DT-S-22P	SEE SSS-22P
Case Dimensions	18" L x 7" W x 7"H	10" L x 7" W x 7"H	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)	6.8 Kg (15 lbs)	10 Kg (22 lbs)
Shipping Weight	5.5 Kg (12 lbs)	4 Kg (8.8 lbs)	9 K (20 lbs)	11.5 Kg (25 lbs)
# PM Tubes	1		2	2
# Amplifiers		2		2
Coincidence Counting		Yes		Yes



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<b>Detected Emitters – Alpha-Beta PLUS</b>	H-3, C-14, S-35	H-3, C-14, S-35	H-3, C-14, S-35	H-3, C-14, S-35
<b>Capacity</b>	1 Vial		3 Vials	3 Vials

### OPTIONS:选购

- Set of 3 calibrated liquid standards, H-3, C-14 and S-35. User must mix TA solutions with liquid scintillant.  
3套液体标准刻度源， H-3, C-14 和S-35， 用户必须将液体闪烁剂混合TA公司溶液配置刻度源。
- Optional Interfaces and Outputs: Clear instructions with all interfaces.  
接口和输出： 所有接口并明确标注
- Data logging software, Model # ORO-22P  
数据收录软件， Model # ORO-22P
- Data acquisition interface and cable with driver, Model # DAQ-3  
数据采集口和数据线， 驱动Model # DAQ-3
- Increase from 3 to 6 sample capacity  
将样品从3瓶增加到6瓶
- MCA Electronics for Gamma Isotope Identification  
多道分析仪电子学用于伽马核素识别
- Printer 打印机

### GAMMA DETECTION: 伽马探测

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.

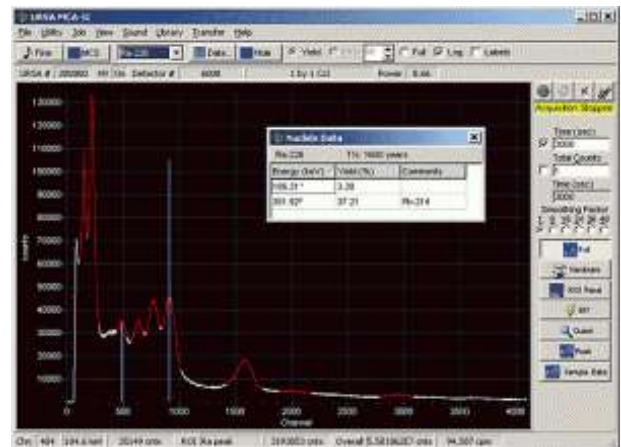
多道分析仪闪烁体探头测量伽马发射体， 512道， 用户可设定能量和读数；例如， 多道分析仪可设定显示15KeV-3.5MeV 伽马峰值。

### Isotope Identification System –核素识别系统

#### TA SMART-PEAK™

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

软件探测低浓度伽马， 同位素识别仪确定并显示辐射



Sample Screen Shot  
MCA Gamma Isotope Identifier



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### MCA ELECTRONIC SYSTEM DESCRIPTION: (Microprocessor based) 多道分析仪电子学系统描述

**Electronics: High Quality Windows PC including:**

电子学: 高质量Windows PC包括

**Operating Software: TAcquire™** custom software plus Excel Spread Sheet

操作软件: 客户定制软件TAcquire™, Excel电子表格

**Radionuclide Library:** Radionuclide Library Tailored To Customer Request

辐射核素库: 应用户要求

**Data:** Stores Data to MS ACCESS Database.

Data Files are Importable into Excel

数据: 存储到 MS ACCESS 数据库

**CPU with Data Acquisition:** 带数据采样CPU

High Resolution COLOR display, Audio

高分辨率彩屏显示加声音

**Data Ports:** USB & Ethernet

数据接口: USB&以太网

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

USB闪存: 数据存储-10年

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

TB硬盘: 存储程序及20年详细数据加报警记录

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

电源: 110 VAC - 60 Hz, 220 VAC 可选 50/60 Hz. 内置备用电池, 故障安全装置

TA LIQUID SCINTILLATION COUNT RANGE TA液闪计数系统量程				
	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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