

ULTRA LOW LEVEL MONITOR: 极低限值监视器

TRITIUM PROPORTIONAL COUNTER: 氚正比计数器

DISCRIMINATES AGAINST OTHER RADIOISOTOPES 识别其它辐射同位素

Model 593 is sensitive only to tritium. A semipermeable membrane is used to isolate tritium oxide for passage into the instrument measuring system. All other sample constituents, including pollutants, radioisotopes, aerosols or particulates are removed and eliminated from the measurement. 593 型号只对氚敏感，用一张半透膜来隔离氚氧化物，导入仪器测量系统。所有其它样品成分，包括污染物、辐射同位素、浮粒或粒子都会被移除，并且从测量值中消除。

FAST RESPONSE THROUGH DEDICATED ELECTRONIC SIGNAL PROCESSING 通过专用电子信号处理进行快速反应

Simultaneous pulse rise and pulse duration signal processing is used to select only those pulses which correspond to tritium beta decay.

脉冲上升和脉冲持续同时，使用信号处理，只选择那些与氚 β 衰变符合的脉冲

This method of pulse selection, described by a number of authors dating back to the 1960's, brings orders of magnitude increase in speed of response, as well as in inherent sensitivity.

这种脉冲选择方法，可以追溯到十九世纪 60 年代，许多作者描述过，在反应速度及灵敏度方面带来了数量级的增加。

MEASURES HTO OR TOTAL TRITIUM

测量氚氧化物或总氚

A catalytic oxidizer can be provided so that either total tritium, or just the oxide form, can be measured at anytime.

提供催化氧化剂以便随时测量总氚或仅其氧化物

COMPENSATED FOR EXTERNAL GAMMA FIELDS

外部 γ 场补偿

Gamma compensation is required to be able to measure to ultra low levels. Model 593 uses not only electronic signal processing to distinguish tritium signals (from background) but also uses dual counters to ensure that the effects of moderate external gamma fields are still further reduced.

要测量极低水平氚辐射，需要 γ 补偿功能。型号 593 不仅使用电子信号处理来区别氚信号（从本底中），还使用双核计数器来确保中等水平外部 γ 场的影响进一步减少。

Lead shielding around the counter tubes is used to reduce background gamma, thereby improving the statistical signal to noise ratio to enhance sensitivity.

计数管周围的铅屏被用来减少本底 γ ，以此改善统计信号噪声比，以提高灵敏度。



MODEL 593

Specifically designed to measure ultra low levels of tritium for compliance with 10CFR61 regulations, Model 593 measures to levels of 3×10^{-9} Ci/m³

100 Bq/m³

专门为测量极低浓度氚设计，

符合 10CFR61 规定。型号 593 探测限

3×10^{-9} Ci/m³

100 Bq/m³

PRINCIPLE OF OPERATION : 工作原理

Model 593 utilizes a pair of balanced proportional counters. The counting gas first passes through the gamma compensation counter, then traverses finally through the second proportional counter.

Model 593 使用一对平衡正比计数器。计量气体首先流过 γ 补偿计数器，然后横流，最后穿过第二个正比计数器。



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FULLY AUTOMATIC OPERATION, CONVENIENT DISPLAY AND CONTROLS

全自动操作，方便显示及操控

Except for routine replacement of the counting gas cylinders, the operation of the instrument is fully automatic and requires no operator attention.

除定期更换的计数气体气缸外，仪器操作为全自动。无需人员操作。

The instrument features a large digital panel meter for measurement display, as well as alarm functions for measurement levels, loss of sample flow, depletion of counting gas or of electronics failure.

此仪器带有一个用于测量显示的数字大面板表，还有针对测量水平、样品流体缺失、计数气体亏空，或电子元件失灵的报警功能。

TECHNICAL SPECIFICATIONS

技术参数

The Model 593 employs two balanced proportional gas flow counter tubes together with a diffusion permeation system for rapid ultra low level tritium specific measurements. The following specifications apply to the standard unit. Consult the factory for variations.

593 机型采用两个平衡的正比流气计数管，和一个扩散渗透系统用于超低水平氚快速测量。以下规格格为标准型号，如有变化咨询工厂。

MEASUREMENT

测量

RANGE 范围	0 to 2 MBq/m ³ (0 to 50 μ Ci/m ³) 0 ~ 2 MBq/m ³ (0 ~ 50 μ Ci/m ³)
DISPLAY 显示	4 1/2 digit panel meter, in steps of 100 Bq/m ³ 4 位 数字显示器，每个间隔增加 100 Bq/m ³
RESOLUTION and NOISE LEVEL 分辨率和噪音水平	100 Bq/m ³ , 1 S.D. (1 σ)
TIME BASE, MEASUREMENT 时间基准，测量	10 minutes, pulses are accumulated (measurement repetition rate) over a 10 minute period. 10 分钟脉冲积累，（测量重复率）10 分钟一个间隔
TIME BASE, BACKGROUND 时间基准，本底	100 minutes (or 10 minutes) pulses from the background compensation counter are averaged over a period as long as 100 minutes to enhance signal stability. 无论 100 分钟还是 10 分钟来自本底补偿计数器脉冲，被平均为 100 分钟间隔， 以增加信号稳定性。
MEASUREMENT INTERFACE OUTPUTS 测量，接口输出	i) 0 - 10 V, linear 线性，0 - 10 V ii) logarithmic, 1 volt/decade 对数，1 伏特，10 进制 iii) E to I, 4 - 20 mA, logarithmic 2 mA/ decade E 到 I, 4 - 20mA, 对数 2mA 十进制 iv) RS - 232 标准 RS - 232
OPTIONAL DISPLAY FEATURES 可选的显示功能	i) chart recorder, logarithmic scale 图表记录器，对数标度



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ii) totalizer integrates measurement
累加器集成测试

ELECTRIC FUNCTIONS

电子功能

ALARMS, MEASUREMENT
报警, 测试

Single alarm point, logarithmic scale
单报警点, 对数标度

ALARMS, SUPERVISORY
报警 监测

i) sample flow failure 样品流失败
ii) counting gas pressure loss 计数气体压力缺失
iii) electronics failure 电子器件失灵

ALARM INTERFACE
报警接口

i) fail safe relay closures 故障安全继电器关闭
ii) RS - 232 标准 RS - 232

PNEUMATIC SYSTEM

气动系统

PROPORTIONAL COUNTERS
正比计数器

Dual copper clad acrylic counter tubes, 2 liter active volume, 2.5 liter wetted volume, 0.001 inch tungsten collector anode
双包铜丙烯酸计数器管, 2 升有效体积, 2.5 升湿量, 0.001 英寸钨集流器阳极

COUNTER GAS
计数器气体

P - 10 or "MAGIC" gas for high performance
高性能 P - 10 或 "神奇" 气体
Flow rate 250 cc/min, typical
流量 250 cc/分钟, 典型性

TRITIUM COLLECTION
氚收集

transfer via a polysulfone semipermeable diffusion membrane
通过聚砜半透扩散膜传送

SAMPLE FLOW SYSTEM
样品流系统

Oscillating piston pump, flow rate 5 lpm typical
振荡活塞泵, 流量 5 lpm, 典型性

FLOW METERS
流量表

front panel rotameters and LED failure displays for counter gas and sampling system
前板转子式流量计, LED 气体及采样系统故障计数显示器

ENCLOSURE
附件

19" relay rack, 48" high, 24" deep approx, indoor use only
19"外箱, 高 48", 深约 24", 仅室内用

WEIGHT
重量

less than 200 lbs
不到 200 磅

POWER
电源

115/230V 50/60 Hz, 100 W max.

ENVIRONMENTAL
环境

temperature 10° C to 30° C 温度 10° C to 30° C
humidity 0 - 95 % R.H. 湿度 0 - 95 % R.H.



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