

ULTRA LOW-LEVEL AUTOMATED TRITIUM AIR & STACK MONITOR

极低限自动空气&烟道氚监测器
Model ~ TRIMARAN-AIR

FEATURES: 特点

- SENSITIVE TO 30 pCi/m³ (1 Bq/m³) IN AIR
灵敏度空气中达30 pCi/m³ (1 Bq/m³)
- **OPTIONAL:** 6 PORT INTAKE MANIFOLD FOR SAMPLING
6 INDIVIDUAL INPUT LINES, SAMPLED IN SERIES
选项: 6进气口电磁阀用于6条独立采样管路, 按顺序采样
- TRITIUM ONLY: IGNORES OTHER NUCLIDES
只测量氚, 忽略其它核素
- PROPORTIONAL COUNTING
正比计数
- AUTOMATIC GAMMA BACKGROUND SUBTRACT
自动伽马本底补偿
- SMART ELECTRONICS; DATA ARCHIVE & RETRIEVAL
智能电子学, 数据存档与检索
- NO ZERO DRIFT
无零点漂移
- ULTRA LOW MDA WITH HIGH ACCURACY
极低探测限高精度
- OUTPUT PORTS: USB, **OPTIONAL** 4-20 mA
数据输出: USB, 或选择4-20 mA
- EASY INTEGRATION INTO FACILITY MAINFRAME
容易与设施内主机联网
- USER SETTABLE – UNITS, ALARM LIMITS, FLOW RATE, ETC.
用户设定-单位, 报警限, 流量等
- RUGGED, RELIABLE, SIMPLE OPERATION; STEEL FRAME MOUNTED
结实, 可靠, 易于操作, 钢框架
- **IP 32**
防护等级



APPLICATION: 应用

- This monitor has been designed for near real time ultra low-level detection of Tritium in the industrial environment of nuclear power plants.
监测器设计设计在核电站工业环境下实时检测极低浓度氚。
- Low MDA, reliability, ruggedness, and simplicity of automatic operation sets this monitor apart from typical laboratory types of equipment.



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TICKER UCLE

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探测限低，可靠，结实，简单自动操作等特点使得这款仪器不同于实验室类设备

- The Model Trimaran-Air & Stack has been designed to feature sample enrichment, measuring the lowest levels of Tritium as possible.

型号Trimaran-Air & Stack设计具有气样浓缩功能，测量极低浓度的氚。

- In addition to industrial use, this monitor is also used for other purposes, such as monitoring changes in Tritium in any setting.

除了工业用途外，此款型号也可用于其它用途，如监测任何情况下需要氚监测时

DESCRIPTION: 描述

The unit condenses water vapor from the air and then extracts T₂ and H₂ from water vapor. The next step is enriching/concentrating the sample, then making sensitive Tritium measurement with matched gas flow proportional counters to minimize cosmic and Gamma radiation effects.

OPTIONAL ½" lead shielding provides lower background.

此仪器冷凝空气中水汽并提取T₂和H₂，接下来浓缩样品，然后使用匹配的流气式正比计数器对氚进行精确测量以减少宇宙射线伽马辐射影响。

选择：½" 铅屏蔽提供较低本底

MDA	MDA
8 HOURS	24 HOURS
5 Bq/M ³	1 Bq/ M ³
150pCi/ M ³	30 pCi/ M ³

DESCRIPTION:

FULLY INTEGRATED PACKAGE 设备完全一体

Model Trimaran-AIR is a completely self-contained instrument for near real time continuous detection of Tritium concentration in air. The instrument is mounted inside a rugged built 200 cm tall steel enclosure with reinforced anchoring feet and locked access.

此型号完全一体实时连续检查气氚浓度，此设备安装在200cm高的钢外壳内，带加固型锚脚和锁

P-10 gas (90% Argon, 10% Methane, non-combustible) cylinder is connected to the unit externally. This quantity is sufficient for 60 days of continuous operation.

P-10气瓶 (90% 氩气 10% 甲烷，不可燃)外部连接到本仪器，可连续使用60天

The main subassemblies are: 主要附件有:

1. Sample air input lines
气样输入管路
2. **OPTIONAL:** Multi-line intake manifold
选择多管路电磁阀
3. Pre-filter



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前置过滤器

4. **OPTIONAL:** External cooling loop in case of hot samples
选项：热气样情况下外置冷却回路
5. Sample pump
采样泵
6. Sample Enrichment assembly
气样浓缩组件
7. Detection module
探测模块
8. Data acquisition electronics module
数据采集电子模块
9. System control module
系统控制模块
10. Output line,
输出管路

REMOTE MONITORING & ALARMING: 遥控监测与报警

- USB, Ethernet & **OPTIONAL** 4-20mA output.
USB, 以太网, 可选4-20mA
- 2 alarm outputs & malfunction outputs in the form of dry, fail-safe, relay contacts.
2个报警输出及故障输出, 干簧故障继电器触片
- Alarms are user adjustable.
用户可调节报警
- Malfunction alarms activate in case of electronics &/or mechanical failures in the system.
系统电子学和/或机械故障激活故障报警器

ADVANTAGES OF PROPORTIONAL COUNTING SYSTEM

正比计数器系统优势

The **Trimaran AIR** utilizes proportional counting technology. A compact standard steel tank of proportional gas will last for two months & is readily available from a variety of suppliers.

The P-10 counting gas is 90% Argon and 10% Methane, is not toxic or combustible.

Measurement with this method achieves better low-end Tritium sensitivity than other methods.

The **Trimaran AIR** offers an **OPTIONAL** 6 port intake manifold for sampling 6 individual input lines, sampled in series & is programmable.

Trimaran AIR 使用正比计数技术, 紧凑的标准钢制容器装满正比气体可以使用2个月, 而且容易找到供气; P10气体为90%氩气, 10%甲烷, 无毒且不燃烧。此种测量方法与其它方法比氚探测下限更低, 此设备可提供6条独立进气管路电磁阀, 按顺序采样, 可编程。



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NEED FOR SAMPLE ENRICHMENT 需要浓缩气样

With proportional counting detectors, Technical Associates / Overhoff Technology has pushed Tritium detection to the most sensitive limit.

However, air/vapor samples may be diluted and even with large proportional detectors there are not enough Bq disintegrations per second for good measurements. This issue is overcome by concentrating or enriching the sample using iterative process to concentrate the Tritium from the Hydrogen vapor

Technical Associates / Overhoff Technology scientists have developed their own proprietary sample enrichment cycle, creating system sensitivities far beyond other automated flow-through systems

使用正比计数探测器, TA/Overhoff使得氚探测灵敏度达到最低限。然而气样有可能被稀释, 即使使用大容量正比计数器也不足以精确测量到Bq/秒, 这个问题通过迭代过程从氢气中浓缩气样得到解决。TA/Overhoff科技人员拥有自主气样浓缩循环技术, 使得系统灵敏度远远高于其它自动流气式系统。

SPECIFICATIONS: 技术参数

ELECTRONICS & MEASUREMENT: 电子学及测量

MEASUREMENT RANGE: 0-10,000 Bq/m³ (Higher Top End is Optional)

量程:

SENSITIVITY: See Chart 1st page

灵敏度: 见第二页表格

DISPLAY: LCD Touch Screen Monitor

显示: LCD触摸屏

UNITS: User Settable

单位: 用户设定

MEASUREMENT METHOD: Gas flow proportional counters

测量方法: 流气式正比计数器

DETECTOR CONSTRUCTION: Dual copper clad acrylic counter tubes, 2 liter active volume, 2.5 liter wetted volume, 0.001 inch tungsten collector anode

探测器结构: 双覆铜丙烯酸计数管, 2升有效容积, 2.5升湿容积, 0.001英寸钨收集极

COUNTER GAS: P-10 or "MAGIC" gas for high performance

计数气体: P-10气体或“神奇”气体以达到高性能

FLOW RATE: 0.5-3 CFM(User Specified) - Continuous Flow is Standard

流量:

ON BOARD COMPUTER: Data-analysis, Archive, Retrieval,

机载电脑: 数据分析, 存档, 检索

OUTPUT: USB & Ethernet OPTIONAL 4-20mA

数据输出:



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SIGNAL PROCESSING: Electronic signal processing of pulses for Tritium specific wave shapes (height and duration)

信号处理: 针对氚波形脉冲电子信号处理 (脉高和脉宽)

ALARM SET POINT: User Settable

报警点: 用户设定

ENVIRONMENTAL: 环境

TEMPERATURE: 0° C to 50° C

温度:

HUMIDITY: 0 to 95 % R. H.

湿度:

SEISMIC: Withstands modest shock

防震: 可防适度震动

GENERAL: Equipment to be sheltered from exposure to raw elements.

总的来说: 设备不可直接放入露天环境下

POWER 电源

ELECTRICAL: Power 110/230VAC, 10A main power

WEIGHT & DIMENSIONS: 重量和尺寸

DIMENSIONS: 31.5" W x 23.6" D x 84" H (800mm x 600mm x 2133mm)

尺寸:

WEIGHT: 1100 lb (~500 kg)

重量:

MECHANICAL: Self-contained, mounted on a steel frame with lifting eyes for easy transport.

机械外壳: 一体式, 钢制外箱带提耳易于运输

PLC CONTROL: PLC控制

- Sampling of input lines and control of flow alarms and pumps is done by PLC unit placed inside of the System Control Module.

输入采样管和流量控制报警及泵由P内置在系统控制模块中的PLC控制

- A manual override is provided in the unlikely event of PLC failure providing manual operation until PLC is replaced.

提供手动控制功能以防PLC系统故障。



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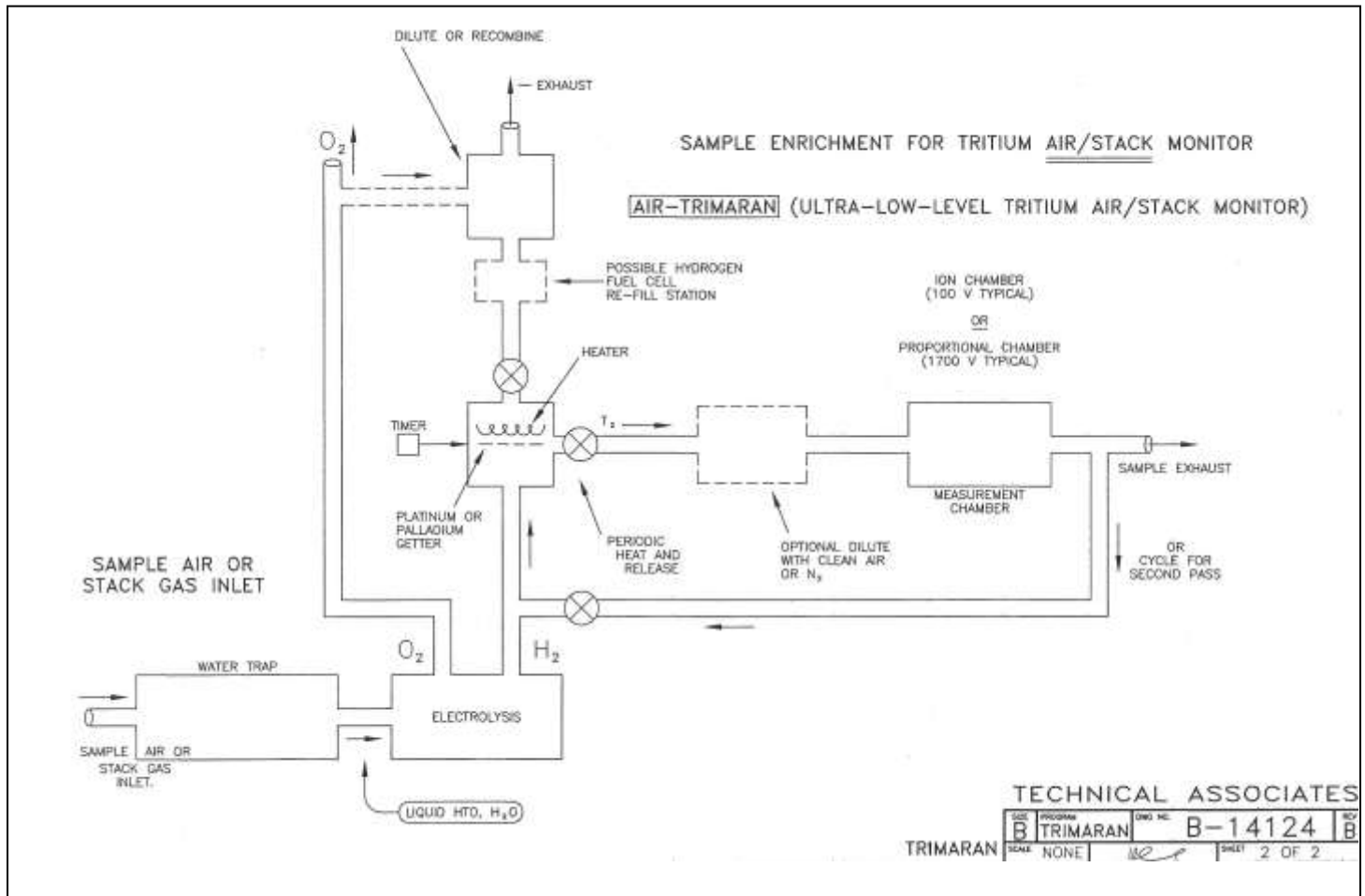
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TRIMARAN-AIR FLOW DIAGRAM



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