

ULTRA SENSITIVE TRITIUM AIR / STACK MONITOR

For Public Release Level and Below

Model Series ~ H3-PRL

Model ~ H3-PRL-5 - 5 Decade Concentration

Model ~ H3-PRL-7- 7 Decade Concentration

FEATURES:

- ULTRA SENSITIVITY TO LOW LEVEL TRITIUM
- 3×10^{-10} $\mu\text{Ci/cc}$ (10 Bq/m³ in 24 hrs)
- 5×10^{-9} $\mu\text{Ci/cc}$ (185 Bq/m³ 1 hr)
- 1×10^{-8} $\mu\text{Ci/cc}$ (370 Bq/m³ in 20 min)
- 1×10^{-7} $\mu\text{Ci/cc}$ (3.7K Bq/m³ in 3 sec)
- STABLE - SELF CONTAINED
- RS-232, USB & ETHERNET
- CONCENTRATION
- TOTAL DAILY RELEASE
- REAL-TIME ALARM
- DYNAMIC BACKGROUND COMPENSATION
- CAN ACTUATE REMOTE CONTROL
- PARTICULATE + ION INLET FILTERS
- WALL MOUNTABLE
- **OPTIONAL:** MEASURES TRITIUM AS HTO IN PRESENCE OF OTHER RADIOACTIVE GASSES (STG-5ATL)



APPLICATION:

Nuclear Power, Fusion Power,
Bio-Tech Industry,
Environmental Monitoring,
Indoor Air Quality

- On Board Memory
- Micro Processor to Establish Units and Parameters
- USB & Ethernet Data Port
- Digital Accuracy Sensitive To 10^{-7} $\mu\text{Ci/Cc}$
- Measures Dose-Rate & Dose
- Alarm – Visual & Audio
- Dynamic Background Gamma Compensation
- Can Actuate Computer or Remote Control
- Measures Tritium as HTO In Presence of Other Radioactive Gases (**STG-5ATL**)
- Cleans Gas Stream of Particulates & Ions



TECHNICAL ASSOCIATES

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DIVISION OF



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OTCOB-UCLC

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DESCRIPTION:

- H3-PRL Series Tritium monitors are sensitive, rugged stack or effluent monitors for detection and measurement of exceptionally low levels of airborne Tritium.
- The subtractive balanced chamber electrometer circuit decreases background effects to negligible levels
- De-ionized and filtered intake reduces to negligible levels spuriousity based on smokes, dusts, and existing ionization in the air.
- Inlet and outlet hoses allow the return of monitored air to source: interiors of fume hoods, exhaust stacks, etc.
- Related models are available to selectively measure only airborne HT or only HTO or C-14 or to exclude Ar-41, Ra etc.

| MODEL | ALL MODELS | H3-PRL-5 | H3-PRL-7 |
|-------------|-----------------------------|-----------------------------|------------------------------|
| | BOTTOM OF RANGE | TOP OF RANGE | TOP OF EXTENDED RANGE |
| RATE | 1 x 10 ⁻⁷ µCi/cc | 1 x 10 ⁻³ µCi/cc | 1.0 µCi/cc |
| | 0.1 pCi/cc | 999.9 pCi/cc | 0.999 µCi/cc |
| | 3.7K Bq/m ³ | 37M Bq/m ³ | 37G Bq/m ³ |
| | | | |

| MODEL | H3-PRL | | |
|--|--|--|------------------|
| | BOTTOM OF RANGE | TOP OF RANGE | INTEGRATION TIME |
| Integrate for Determining Concentration | 3 x 10 ⁻¹⁰ (10 Bq/m ³) | 1 x 10 ⁻⁶ µCi/cc (370 Bq/m ³) | 24 hours |
| | 5 x 10 ⁻⁹ (185 Bq/m ³) | 1 x 10 ⁻⁵ µCi/cc (3.7K Bq/m ³) | 1 hour |
| | 1 x 10 ⁻⁸ (370 Bq/m ³) | 1 x 10 ⁻⁴ µCi/cc (37K Bq/m ³) | 20 minutes |



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Model ~ H3-PRL-7- 7 Decade Concentration

SPECIFICATIONS:

Integrate to Determine

| | |
|--------------------------------------|--|
| Total Daily RELEASE: | Model Series H3-PRL SERIES automatically multiplies real-time concentration by your average daily stack output and reports total daily release from 0 $\mu\text{Ci/day}$ to 10^{99} $\mu\text{Ci/day}$. |
| Background: | Essentially eliminated by subtractive balanced chambers. |
| Smoke, Dust, Ion Elimination: | Filter and de-ionizer reduce effects to negligible levels. |
| Circuit: | Electrometer circuit amplifies net difference between a 25 liter tritium internal chamber and internal background chamber of identical size and configuration. |
| Detector: | Air stream is passed through sample chamber to measure all Tritium gas content. OPTION: Xenon, Krypton, $^{14}\text{CO}_2$, etc. |
| Calibration: | Can be calibrated internally with Tritium (or HTO) gas, or on a Gamma calibration course; or can be checked at a single point with an external (not provided) Beta source. |
| Factory Calibration: | Performed prior to shipment with accompanying Calibration Certificate. |
| Field Calibration: | Calibration check may be performed in the field with optional license exempt microCurie level Beta source. |

DATA OUTPUTS:

Digital: RS-232 serial port. One count per second per 1×10^{-7} $\mu\text{Ci/cc}$.

Analog: **OPTIONAL:** 0-5 V or 4-20mA

Alarms: **High Level:** Red flashing light with audio

System Fault: White steady light

Remote Alarm: TTL closure for system failure

TTL closure for High Level alarm

Data Retrieval: RS-232 serial port

Dimensions: 36" wide x 30" high x 17.5" deep.

Weight: 40 lbs. (18.4 kg)

Optional Features/Accessories:

- Remote alarm (audible & visual)
- Model RAL-8 – Remote Alarm and Meter (including 25 ft of cable).
- Can be used to 500'.
- 4-20 mA for computer.
- Other manual range switching or auto-range features.
- Relay contacts for high or low alarm, or both.
- Interconnection to/from port of other gas or particulate monitor.
- Readout as radioactive gas other than Tritium.



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TRITIUM IN AIR SERIES COMPARISON – STACK OR EFFLUENT MONITORS –2024

Nuclear Power Plants, Labs: Radiation, Research, Radiopharmacy

| TRITIUM SERIES COMPARISON ~ (PUBLIC RELEASE LEVEL OR LOWER) | | | | |
|---|--|--|---|--|
| | MODEL | MODEL | MODEL | MODEL |
| | STG-4S/D | STG-5ATL | H3-PLR -5 | H3-PLR -7 |
| FEATURES | 6 DECADES | 4 DECADES | 5 DECADES | 7 DECADES |
| | H3 & NOBLE GASES | DETECTS HTO & H3 | ALL TRITIUM | ALL TRITIUM |
| | $10^7 \times 10^{-1} \mu\text{Ci/cc}$ | H3 - $10^7 \times 10^{-3} \mu\text{Ci/cc}$ HTO - $1 \times 10^{-7} \mu\text{Ci/cc}$ | $1 \times 10^{-7} \mu\text{Ci/cc} - 1 \times 10^{-3} \mu\text{Ci/cc}$ | $1 \times 10^{-7} \mu\text{Ci/cc} - 1.0 \mu\text{Ci/cc}$ |
| | SINGLE CHAMBER | DUAL CHAMBER | DUAL CHAMBER | DUAL CHAMBER |
| | SEES ALL RADIATION ON (1) SINGLE CHANNEL | SEPARATELY ON (2) TWO CHANNELS | USES (1) SINGLE CHANNEL WITH RANGE SWITCHING | USES (1) SINGLE CHANNEL WITH RANGE SWITCHING |
| | DOSE & DOSE RATE | DOSE & DOSE RATE | READS: 3 SEC, 20 MIN, 1 HR, 24 HR, TOTAL DAILY RELEASE | READS: 3 SEC, 20 MIN, 1 HR, 24 HR, TOTAL DAILY RELEASE |



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