



MODEL RS400-HTO PORTABLE TRITIUM IN AIR MONITOR

The **Model RS4000-HTO** is a portable tritium in air monitor that is based off the Model 400SBD_γC but includes two additional features: RS-232 data output and HTO discrimination. All models in the 400 series include 400cm³ of total ionization measurement volume with 400cm³ of gamma compensation volume. Featuring an upgraded electrometer, the 400 series offers excellent sensitivity and high stability. Thermally induced zero shifts of the electrometer have been eliminated.

SENSITIVITY

The **RS400-HTO** is useful for measurements as low as 3 μCi/m³ (0.1 MBq/m³). The Overhoff electrometer, which measures to below 10⁻¹⁶ amperes, combines low noise and high zero stability.

HTO DISCRIMINATION (NOBLE GAS COMPENSATION)

By addition of a desiccant column interposed between measuring and compensating chambers, this survey instrument will specifically measure only tritium oxide (HTO), ignoring all other airborne radionuclides (such as noble gases) and gamma fields. The desiccant can be regenerated repeatedly for reuse.

INCLUDES RS-232 DATA OUTPUT

The Model RS400-HTO includes RS-232 data output.

RADON INTERFERENCE, NOISE RESPONSE

For an unambiguous measurement of very low tritium a monitor must be able to ignore response to ambient radon. The RS400-HTO incorporates this capability and therefore produces accurate, fast and drift free measurements to nearly ±1 μCi/m³.

TOTAL GAMMA COMPENSATION

Cruciform ionization chamber geometry provides nearly perfect gamma compensation regardless of photon energy, flux gradient or flux direction. Gamma compensation of the RS400-HTO is typically three orders of magnitude better than instruments using nested or side by side ionization chambers.

FAST RESPONSE

Its exceptionally rapid response is primarily due to its ability to ignore radon. The electronic time constant is only 10 seconds, the pneumatic time constant of about 12 seconds, for an overall time constant of only 15 seconds. Meter readings will reach 90% of final value within 30 seconds to a step response of aspirated tritium.

FAST WARM UP, NO ZERO DRIFT

After applying power, the initial transient “warm up” drift effects take less than a minute. Long term drifts have been eliminated and manual zero adjustments are no longer required.



High Sensitivity	to 3 μCi/m ³ (0.1 MBq/m ³)
Fast Response	15 second time constant
Gamma Compensated	virtually no offset in 10 mR/h fields
Response To Radon	suppression circuit ensures noise free operation
No Zero Drift	long term zero stability to better than 1μCi/m ³
Rapid Warm Up	less than 30 seconds

The Overhoff Technology Model **RS400-HTO** portable tritium monitor is an instrument with unequalled performance in sensitivity, stability, speed of response, and gamma compensation. HTO discrimination allows the user to precisely measure only tritium even in the presence of other radioactive gases and external gamma fields.

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PORTABLE TRITIUM IN AIR MONITOR

TECHNICAL SPECIFICATIONS

MEASUREMENT RANGE	Available in the following ranges: i) 1 to 19,999 $\mu\text{Ci}/\text{m}^3$, basic sensitivity of the order of 3 $\mu\text{Ci}/\text{m}^3$ ii) 0.1 to 1,999.9 MBq/ m^3 or DAC iii) 1 to 19,999 $\mu\text{Sv}/\text{h}$
DISPLAY	0 – 19,999 digits, LCD panel meter
ACCURACY, SPAN	$\pm 10\%$ of reading, $\pm 2 \mu\text{Ci}/\text{m}^3$, whichever is greater
NOISE LEVEL	$\pm 1 \mu\text{Ci}/\text{m}^3$, 1 S.D. (10 second electronic time constant)
ZERO STABILITY	after 30 seconds (or less) warm up, zero drift less than $\pm 1 \mu\text{Ci}/\text{m}^3$
GAMMA COMPENSATION	chambers in a side by side pattern reduce errors due to external gamma radiation.
ALPHA PULSE SUPPRESSION	a circuit provides recognition and cancellation of undesirable noise spikes attributed to airborne radon
RESPONSE RATE	30 seconds to reach 90% of final reading
ALARM (ACOUSTIC)	1. Ten position stepped attenuator set point for signal alarm 2 - 1,000 $\mu\text{Ci}/\text{m}^3$, steady tone. OFF position is included. 2. Low flow produces an intermittent tone 3. Mute switch silences audible tone
ALARM (VISUAL)	signal level: red LED, when tritium exceeds setpoint low flow: yellow LED, flashing, low pump flow low battery: red LED HVPS Failure: red LED illuminates to indicate a malfunction of the high voltage power supply used to bias the ionization chambers
EXTERNAL CONNECTIONS	RS-232 Data Output
IONIZATION CHAMBER VOLUME	effective volume: 400 cm^3 port to port volume: 440 cm^3
DUST FILTER	HEPA, external in-line disposable cartridge type
PUMP	internal rotary vane pump
FLOW RATE	nominally 1.5 - 2 LPM
ENVIRONMENTAL	0° C to +40° C, 10 - 95 % relative humidity non-condensing
BATTERIES	two "D" size NiMH or Alkaline batteries external jack for supplementary power input and charging
POWER CONVERTER	100-240 VAC, 50/60 Hz, .25 A to 3.3 Vdc @ 1.2 A 5.5 mm O.D. x 2.1 mm I.D. Plug, center pin is positive
SIZE AND WEIGHT	7.6" [193mm] L x 5.2" [132mm] W x 6.9" [175mm] H excluding handle, 6.5 lbs (3 kg)

Includes: 2 "D" size batteries (installed), sniffer hose, dust filter, 2.3 meter long cable with Mini-DIN plug for J2 output connector at one end, power converter 100-240VAC, and two desiccant columns filled with silica gel.

Other models in the series:

Model RS400:	Includes RS-232 data output but does not include HTO discrimination
Model 400SBDyC:	General purpose portable tritium in air monitor. Does not include RS-232 or HTO discrimination.

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