



# MODEL 400AC PORTABLE TRITIUM IN AIR MONITOR

The Model 400AC portable tritium monitor is based on our popular Model 400 platform and is a small, high sensitivity, hand held, battery (rechargeable) operated, fully gamma-compensated survey meter with RS232 serial data output and user recalibration features.

### ADDITIONAL FEATURES OF THE MODEL 400AC (NOT AVAILABLE ON THE MODEL 400SBDyC)

- Disable Gamma Compensation
- Rechargeable Batteries and Rechargeable Battery Capacity Monitor
- Power Supply and High Bias Voltage Failure Monitors
- Manual and **Automatic Calibration**
  - a) Calibration with Tritium Gas
  - b) Calibration with a Gamma Source  
(Using Gamma-Tritium Equivalence Ratio)
- Improved Gamma Compensation and Noise Immunity
- Constant Air Flow Control
- 50% Fewer High Bias Voltage Batteries

### SENSITIVITY

The **400AC** is useful for measurements as low as  $2 \mu\text{Ci}/\text{m}^3$ . The Overhoff electrometer, which measures to below  $10^{-16}$  amperes, combines low noise and high zero stability.

### RADON INTERFERENCE, NOISE RESPONSE

For an unambiguous measurement of very low tritium a monitor must be able to ignore response to ambient radon. The 400AC incorporates this capability and therefore produces accurate, fast and drift free measurements to nearly  $\pm 1 \mu\text{Ci}/\text{m}^3$ .

### 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 400AC is typically three orders of magnitude better than instruments using nested or side by side ionization chambers.

Gamma compensation can be disabled in cases when not required.

### 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.

### AUTOMATIC CALIBRATION

The 400AC features the ability to perform a fully automatic gamma calibration by using the provided calibration software. Calibration is started with a single mouse click and requires no intervention. Calibration consists of 3 stages, taking 2 minutes each, for a total of 6 minutes. During the calibration the compensation ionization chambers are disabled automatically. Upon completion a printed calibration report is generated automatically.



High Sensitivity	to $2 \mu\text{Ci}/\text{m}^3$
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 $1 \mu\text{Ci}/\text{m}^3$
Rapid Warm Up	less than 30 seconds

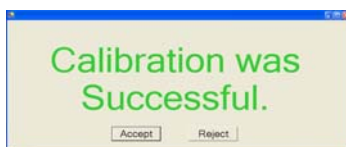
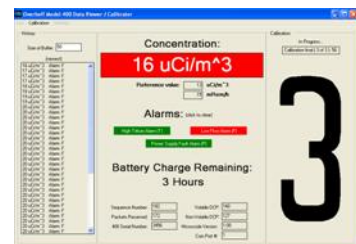
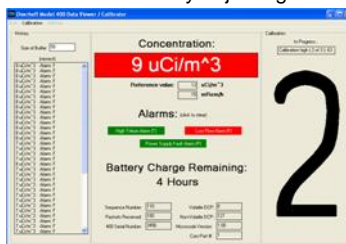
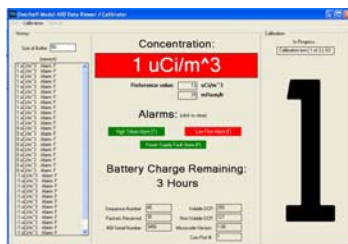
The Overhoff Technology Model **400AC** portable tritium monitor is an instrument with unequalled performance in sensitivity, stability, speed of response and gamma compensation.

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MEASUREMENT RANGE	1 – 19,999 $\mu\text{Ci}/\text{m}^3$ , basic sensitivity of the order of 2 $\mu\text{Ci}/\text{m}^3$
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)	<ol style="list-style-type: none"> <li>1. Ten position stepped attenuator set point for signal alarm 2 - 1,000 <math>\mu\text{Ci}/\text{m}^3</math>, steady tone. OFF position is included.</li> <li>2. Low flow produces an intermittent tone</li> <li>3. Mute switch silences audible tone</li> </ol>
ALARM (VISUAL)	signal level: red LED low flow: yellow LED, flashing low battery: red LED
EXTERNAL CONNECTIONS	RS232 serial data output for tritium measurement, level alarm status and calibration
IONIZATION CHAMBER VOLUME	effective volume: 400 $\text{cm}^3$ port to port volume: 440 $\text{cm}^3$
DUST FILTER	external in-line disposable cartridge type
PUMP	internal rotary vane pump
FLOW RATE	nominally 1.5 - 2 LPM
ENVIRONMENTAL	0° C to +40° C, 20 - 90 % relative humidity non-condensing
BATTERIES	two "D" size NiMH 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)
CALIBRATION	Automatic Calibration using pc-based software (included) Manual Calibration by adjusting a calibration potentiometer



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## MODEL 400AC PORTABLE TRITIUM IN AIR MONITOR

### PART LISTS

<u>Qty Req'd</u>	<u>Part No.</u>	<u>Description</u>
1	50084	Pump
4	1020686	Ionization Chamber
1	PSF-100A-0.5	Pressure Switch
1	22BH-4-2	Hose Barb, Sample-In
1	230-4-2	Hose Barb, Sample-Out
1	12082	Inline Dust Filter
1	CLIC-51	Holder for Dust Filter 12082
1	DMO-742W	LCD Panel Meter
2	20-3320	Control Knob including Cap and Skirt
1	KU402B1/8	Offset Knob
2	B16	Battery Holder
2	B1-XC	Battery Cap
1	MSR320	Alarm Speaker
1	PSA05R-033	AC Adapter
1	RPS-R	AC Plug for Adapter
1	CP-004A-ND	Plug for DC Power
1	163-5004	Jack for DC Power
2	GP450DHC	Batteries, D-Size NiMH, Primary Power
2	415	Batteries, 45V, Polarizing
1	J2-400AC	RS232 Cable

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