



# 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 Switch for Gamma Source Calibration**  
 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

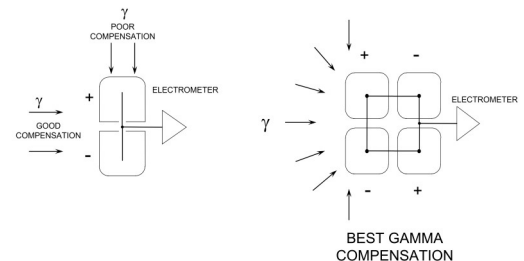
After applying power, the initial transient "warm up" drift effects take less than a minute. Long term drifts have been eliminated and manual zero adjustments are no longer required.

## 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.



## GAMMA COMPENSATION



<b>High Sensitivity</b>	to $2 \mu\text{Ci}/\text{m}^3$
<b>Fast Response</b>	15 second time constant
<b>Gamma Compensated</b>	virtually no offset in 10 mR/h fields
<b>Response To Radon</b>	suppression circuit ensures noise free operation
<b>No Zero Drift</b>	long term zero stability to better than $1 \mu\text{Ci}/\text{m}^3$
<b>Rapid Warm Up</b>	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.

## TECHNICAL SPECIFICATIONS

<b>MEASUREMENT RANGE</b>	1 – 19,999 $\mu\text{Ci}/\text{m}^3$ , basic sensitivity of the order of $2 \mu\text{Ci}/\text{m}^3$ Other available measurement ranges: 0.1 to 1,999.9 MBq/ $\text{m}^3$ or DAC 1 to 19,999 $\mu\text{Sv}/\text{h}$						
<b>DISPLAY</b>	0 – 19,999 digits, LCD panel meter						
<b>ACCURACY, SPAN</b>	$\pm 10\%$ of reading, $\pm 2 \mu\text{Ci}/\text{m}^3$ , whichever is greater						
<b>NOISE LEVEL</b>	$\pm 1 \mu\text{Ci}/\text{m}^3$ , 1 S.D. (10 second electronic time constant)						
<b>ZERO STABILITY</b>	after 30 seconds (or less) warm up, zero drift less than $\pm 1 \mu\text{Ci}/\text{m}^3$						
<b>GAMMA COMPENSATION</b>	chambers in a side by side pattern reduce errors due to external gamma radiation.						
<b>ALPHA PULSE SUPPRESSION</b>	a circuit provides recognition and cancellation of undesirable noise spikes attributed to airborne radon						
<b>RESPONSE RATE</b>	30 seconds to reach 90% of final reading						
<b>ALARM (ACOUSTIC)</b>	<ol style="list-style-type: none"> <li>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>Low flow produces an intermittent tone</li> <li>Mute switch silences audible tone</li> </ol>						
<b>ALARM (VISUAL)</b>	<table border="0"> <tr> <td>signal level:</td> <td>red LED</td> </tr> <tr> <td>low flow:</td> <td>yellow LED, flashing</td> </tr> <tr> <td>low battery:</td> <td>red LED</td> </tr> </table>	signal level:	red LED	low flow:	yellow LED, flashing	low battery:	red LED
signal level:	red LED						
low flow:	yellow LED, flashing						
low battery:	red LED						
<b>EXTERNAL CONNECTIONS</b>	RS232 serial data output for tritium measurement, level alarm status and calibration						
<b>IONIZATION CHAMBER VOLUME</b>	<table border="0"> <tr> <td>effective volume:</td> <td>400 <math>\text{cm}^3</math></td> </tr> <tr> <td>port to port volume:</td> <td>440 <math>\text{cm}^3</math></td> </tr> </table>	effective volume:	400 $\text{cm}^3$	port to port volume:	440 $\text{cm}^3$		
effective volume:	400 $\text{cm}^3$						
port to port volume:	440 $\text{cm}^3$						
<b>DUST FILTER</b>	external in-line disposable cartridge type						
<b>PUMP</b>	internal rotary vane pump						
<b>FLOW RATE</b>	nominally 1.5 - 2 LPM						
<b>ENVIRONMENTAL</b>	0° C to +40° C, 20 - 90 % relative humidity non-condensing						
<b>BATTERIES</b>	two "D" size NiMH batteries external jack for supplementary power input and charging						
<b>POWER CONVERTER</b>	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						
<b>SIZE AND WEIGHT</b>	7.6" [193mm] L x 5.2" [132mm] W x 6.9" [175mm] H excluding handle, 6.5 lbs (3 kg)						
<b>CALIBRATION</b>	Automatic Calibration using pc-based software (included) Manual Calibration by adjusting a calibration potentiometer						

