

PORTABLE TRITIUM MONITORS



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PORTABLE TRITIUM SURVEY MONITORS

MODEL 200SB **(DUAL 200 cc CHAMBERS, MDA 10 μ Ci/m³)**

Economy model with medium sensitivity for general purpose survey duty. Combines good gamma compensation with very fast measurement response. Fast warm up and complete temperature stability, and wide range makes it particularly useful as an emergency monitor in nuclear power plants and in similar applications.

MODEL 400SBD γ C **(QUAD 200 cc CHAMBERS, MDA 2 μ Ci/m³)**

Low cost instrument with sensitivity to 2 μ Ci/m³, quadruple 200 cc ionization chambers for complete gamma compensation even in substantial non uniform gamma fields. Fast warm up, temperature stable drift free performance of measurement of tritium in the presence of other radioactive gases. Particularly useful for low level area portable monitoring. Applications in nuclear power plants and processing facilities.

MODEL SP1400DD **(DUAL 1400 cm³ CHAMBERS, MDA 1 μ Ci/m³)**

Sensitivity to 1 μ Ci/m³, dual 1400 cc ionization chambers for tritium specific measurements in the presence of other radioactive (noble) gases. Automatic Zero for temporary use in fixed locations. Applications include portable area monitoring in processing facilities, power plants, fusion research facilities or wherever ultra high sensitivity portable tritium monitors are required.



MODEL 200SB MODEL 200SB HTO

MODEL 200SB AND
200SB HTO

The Overhoff Technology Corporation 200SB portable tritium survey monitor is a low cost light weight survey meter. The front panel features only three controls, an ON - OFF - SAMPLE switch and the switch for setting the alarm level. Zero adjustment is unnecessary, the 200SB shows no zero drift over a temperature range of 0° C to +50° C. A large pump and fast electronics are combined to give this instrument fast overall response.

SENSITIVITY, RANGE, SPEED OF RESPONSE

This instrument is useful where measurement sensitivities of the order of 10 $\mu\text{Ci}/\text{m}^3$ (1 MPCA) is sufficient, and where wide range, and fast response are needed.

This low cost portable model has a 4 1/2 digit LCD display for readings from 0 to 19,999 MPCA.

CONVENIENT FOR USE

The instrument needs no zero adjustment. It is ready for use by merely selecting the desired alarm level and activating the instrument power.

The initial power surge transient will disappear in a minute, the readings will then be accurate.

GAMMA COMPENSATION

The use of twin, side by side, or coaxial ionization chambers provides good gamma compensation in moderate background gamma radiation fields.

FAST RESPONSE

The use of a large pump, 3 liters a minute, together with fast electronics yields an overall measurement time constant of under 5 seconds.

HTO DISCRIMINATION

An HTO discriminating version is available. By addition of an external desiccant column, this survey instrument will specifically measure HTO in the presence of HT, or other radioactive gases.



WIDE RANGE MEDIUM SENSITIVITY TRITIUM IN AIR PORTABLE SURVEY MONITOR

Wide Range	to 199,999 $\mu\text{Ci}/\text{m}^3$ (19,999 MPCA)
Resolution	10 $\mu\text{Ci}/\text{m}^3$ (1 MPCA)
Fast Response	3 second time constant
Gamma Compensated	dual side-by-side chambers
No Zero Drift	
Rapid Warm Up	



MODEL 200SB

MODEL 200SB SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

MEASUREMENT RANGE	10 – 199,999 $\mu\text{Ci}/\text{m}^3$, basic sensitivity of the order of 10 $\mu\text{Ci}/\text{m}^3$
DISPLAY	0 – 19,999 digits, LCD panel meter
GAMMA COMPENSATION	two chambers in a side by side arrangement
RESPONSE RATE	5 seconds to reach 90 % of final reading,
NOISE LEVEL	$\pm 10 \mu\text{Ci}/\text{m}^3$, 1 S.D. (3 second electronic time constant)
ZERO STABILITY	after 1 minutes (or less) warm up, the zero drift to less than 10 $\mu\text{Ci}/\text{m}^3$
ALARM (ACOUSTIC) signal of 20 – 10,000 $\mu\text{Ci}/\text{m}^3$, steady tone	1. nine position stepped attenuator set point for 2. low flow produces a steady tone
ALARM (VISUAL)	signal level: red LED low flow: yellow LED low battery: red LED
DUST FILTER	in line disposable cartridge Pall No. 12082
SAMPLING SYSTEM	2 hose barb ports are located on the front panel
IONIZATION CHAMBER VOLUME	effective volume: 200 cm^3 port to port volume: 220 cm^3
PUMP	Special high volume internal pump for a flow rate from 2-3 LPM
POWER	two "D" size batteries alkaline, carbon-zinc or NiCd,
ENVIRONMENTAL	0° C to +50° C, 0 - 98 % RH
CASE	light weight aluminum
SIZE AND WEIGHT	7.6" L, 5.2" W, 4.4" H excluding handle, 5 lbs (2.3 kg)
ACCESSORIES	sniffer hose
OPTIONAL EQUIPMENT	transit case jack for external power supply



NOBLE GAS OR HTO SPECIFIC MODEL 200SB-HTO

A special version of the basic 200SB instrument with six hose connections is available for specific HTO measurement in the presence of HT or other radioactive gases as well as external and internal gamma fields.

PARTS LIST FOR MODEL 200SB TRITIUM MONITOR

**MODEL 200SB
PARTS LIST**

<u>Qty Req'd</u>	<u>Part No.</u>	<u>Description</u>
2	1020686	Ionization Chamber
1	50085	Pump
1 to 5	22BH-4-2	Hose Barb, Sample-In
1	230-4-2	Hose Barb, Sample-Out
1	DMO-742	Digital Panel Meter
2	B16	Battery Holder
2	B1-XC	Battery Cap
2	EN95	Batteries, D-Size Alkaline, Primary Power
4	415	Batteries, 45V Polarizing
1	12082	In Line Dust Filter, Pack of 3
1	CLIC-51	Dust Filter Clip
1	PSF-100A-0.5	Pressure Switch
1	MSR320	Alarm Speaker
2	20-3320	Control Knob, Cap and Skirt
1	KU402B1/8	Zero Knob



HIGH PERFORMANCE TRITIUM IN AIR PORTABLE SURVEY MONITOR

SENSITIVITY

The **400SBD γ C** is useful for measurements as low as $2 \mu\text{Ci}/\text{m}^3$. The new OTC electrometer, which measures to below 10^{-16} amperes combines low noise and high zero stability. Unlike other instruments, the 400 series instruments no longer require a front panel manual zero control. Thermally induced zero shifts of the electrometer and associated electronics have been eliminated.

RADON INTERFERENCE, NOISE RESPONSE

For an unambiguous measurement of very low tritium a monitor must be able to ignore response to ambient radon. The 400SB series 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 400 series instruments is typically three orders of magnitude better than instruments using nested or side by side ionization chambers.

FAST RESPONSE

Its exceptionally rapid response is uniquely 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, manual zero adjustments are no longer required.

HTO DISCRIMINATION (MODEL 400SBD γ C-HTO)

By addition of a desiccant column, this survey instrument will specifically measure HTO in the presence of other radioactive gases as well as background gamma. The desiccant can be regenerated repeatedly for reuse.



High Sensitivity	to $2.0 \mu\text{Ci}/\text{m}^3$
Fast Response	10 second time constant
Gamma Compensated	virtually no offset in $10 \text{ mR}/\text{h}$ fields
No Response To Radon	ensures complete zero stability
No Zero Drift	long term zero stability to better than $1 \mu\text{Ci}/\text{m}^3$
Rapid Warm Up	less than 30 second warm-up

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



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MODEL 400SBD γ C

MODEL 400SBD γ C SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

MEASUREMENT RANGE	1 – 19,999 $\mu\text{Ci}/\text{m}^3$, basic sensitivity of the order of 1 $\mu\text{Ci}/\text{m}^3$
DISPLAY	0 – 19,999 digits, LCD panel meter
ACCURACY, SPAN	$\pm 10\%$ of reading, $\pm 1 \mu\text{Ci}/\text{m}^3$, whichever is greater
NOISE LEVEL	$\pm 1 \mu\text{Ci}/\text{m}^3$, 1 S.D. (10 second electronic time constant)
ZERO STABILITY	$\pm 1 \mu\text{Ci}/\text{m}^3$ long term
GAMMA COMPENSATION	Four chambers in a cruciform pattern to 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. An OFF position is included. 2. Low flow produces an intermittent tone 3. Mute switch silences audible tone
ALARM (VISUAL)	signal level: red LED low flow: yellow LED, flashing low battery: red LED
EXTERNAL CONNECTIONS	mini DIN plug for output signal, and for alarms
IONIZATION CHAMBER VOLUME	effective volume: 400 cm^3 port to port volume: 440 cm^3
DUST FILTER	HEPA, in-line disposable cartridge, Pall P/N 12082
PUMP	internal rotary vane pump
FLOW RATE	nominally 1.5 - 2 LPM
ENVIRONMENTAL	0° C to +50° C, 0 - 95 % relative humidity
BATTERIES	two "D" size batteries alkaline external jack for supplementary power input
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
CASE	lightweight aluminum
SIZE AND WEIGHT	7.6" [193mm] L x 5.2" [132mm] W x 6.9" [175mm] H excluding handle, 6.5 lbs (3 kg)
OPTIONAL EQUIPMENT	<ul style="list-style-type: none">transit caseRS232 Serial Data output

NOBLE GAS DISCRIMINATION: MODEL 400SBD γ C -HTO ONLY

A special version of the basic 400 series instrument is for measurement of tritium (oxide) in the presence of radioactive noble gases. By addition of a desiccant cartridge, this instrument will respond solely to HTO, ignoring all other airborne radio nuclides and gamma fields.



PARTS LIST FOR MODEL 400SBD γ C TRITIUM MONITOR

**MODEL 400SBD γ C
PARTS LIST**

<u>Qty Req'd</u>	<u>Part No.</u>	<u>Description</u>
1	50084	Pump (replaces 50030 and G02/CDC/3)
4	1020686	Ionization Chamber
1	PSF-100A-0.5	Pressure Switch
1 to 5	22BH-4-2	Hose Barb, Sample-In
1	230-4-2	Hose Barb, Sample-Out
1	CLIC-51	Holder for Dust Filter (12082)
1	DMO-41	LCD Panel Meter (oldest S/N)
1	DMO-41DC	LCD Panel Meter (intermediate S/N)
1	DMO-742W	LCD Panel Meter (newest S/N)
2	20-3320	Control Knob including Cap and Skirt
1	KU402B1/8	Zero 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	EN95	Batteries, D-Size Alkaline, Primary Power
4	415	Batteries, 45V Polarizing



ULTRA SENSITIVE PORTABLE TRITIUM MONITORS

MODELS

SP1400DD

ULTRA HIGH SENSITIVITY, FAST RESPONSE TO 1.0 μ Ci/m³.

True, unambiguous measurement to low levels combined with a fast response (10 sec. electronic time constant), not matched by any other portable tritium survey monitor.

INSTANTANEOUS WARM UP

The instrument will generally settle to 1.0uCi/m³ within one minute after application of power.

NO LONG TERM DRIFT

The instrument is free from long term drift by using a highly stable electrometer design.

SMALL IONIZATION CHAMBERS, EFFECTIVE GAMMA COMPENSATION

Dual 1400 cc ionization chambers keep the overall instrument size and weight to a manageable size.

HEAVY DUTY PUMP

A generously sized pump provides up to 4 volume changes per minute to ensure a fast overall measurement response.

DIGITAL DISPLAY

The SP1400 series uses a 4-1/2 digit LCD display



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ULTRA SENSITIVE PORTABLE TRITIUM MONITORS

TRULY PORTABLE

A shoulder strap frees both hands for directing the sniffer hose when the instrument is used for leak detection, or similar purposes.

DISPOSABLE IN LINE FILTER

A small throw away cartridge filter fits directly onto the plastic sniffer hose, ensuring that the ionization chambers are protected against debris and dust.

SUPPLIED COMPLETE WITH WALL CHARGER

A wall charger for NiMH batteries maintains full battery charge under all instrument operating conditions.

SEMI PERMANENT AREA/STACK MONITOR

The sensitivity of the SP1400 exceeds that of most "fixed" monitors, it can therefore be used for similar duty. The internal pump has been rated for 2000 hours MTBF. Model SP1400 can be used for area monitoring for several months at a time.

REMOTE FACILITIES

A multi pin connector on the front plate of the instrument has been provided for the connection to remote meter displays, alarms and chart recorders.

COVER WITH CARRYING HANDLE

A matching cover which attaches with two draw latches serves to stow the carrying strap, the sniffer hose and spare dust filters.



PORTABLE TRITIUM MONITOR SP 1400DD

SP1400DD SPECIFICATIONS

TECHNICAL SPECIFICATIONS, micro Curie units of measure

Range	Single Range 0 - 19,999 $\mu\text{Ci}/\text{m}^3$
Display	4 1/2 digit LCD display in steps of $1\mu\text{Ci}/\text{m}^3$
Stability	0.5 $\mu\text{Ci}/\text{m}^3$ long term, for temperatures 0° C to 40° C
Alarm (acoustic)	set point adjustment with a ten position attenuator RESET/ON/OFF toggle switch
Interface	connector for remote display or chart recorder, alarm output
Power	6 D size batteries, NiMH, furnished with a detachable wall charger
Ionization Chambers	dual chambers, one chamber used for gamma compensation, volume 1400 cm^3 each, deep drawn aluminum
Pump	brushless dc miniature pump for 4 to 6 volume changes per minute, ON - OFF switch
Size	front panel approximately 5" x 13", depth 12" including carrying handle
Weight	16 lbs
Accessories	carrying strap; sniffer hose; dust filter; wall charger



PORTABLE TRITIUM MONITOR SP 1400DD

SP1400DD
SPECIFICATIONS

TECHNICAL SPECIFICATIONS, mega Becquerel units of measure

Range	Single Range 0.01 - 199.99MBq/m ³
Display	4 1/2 digit LCD display in steps of 0.01MBq/m ³
Stability	0.5 μCi/m ³ long term, for temperatures 0° C to 40° C
Alarm (acoustic)	set point adjustment with a ten position attenuator RESET/ON/OFF toggle switch
Interface	connector for remote display or chart recorder, alarm output
Power	6 D size batteries, NiMH, furnished with a detachable wall charger
Ionization Chambers	dual chambers, one chamber used for gamma compensation, volume 1400 cm ³ each, deep drawn aluminum
Pump	brushless dc miniature pump for 4 to 6 volume changes per minute, ON - OFF switch
Size	front panel approximately 5" x 13", depth 12" including carrying handle
Weight	16 lbs
Accessories	carrying strap; sniffer hose; dust filter; wall charger



PARTS LIST FOR MODEL SP1400DD TRITIUM MONITOR

**SP1400DD
PARTS LIST**

<u>Qty Req'd</u>	<u>Part No.</u>	
		<u>Consumables</u>
1	BP06C>NNNF28VC3	Pump
1	DMO-742	Panel Meter
1	FW7304/10	Battery Charger
1	1020421	Battery Cover Gasket
1	1020415-M	Ionization Chamber Measurement side
1	TCCM773	Shoulder Strap
1	MS3116F14-15P	remote output connector plug
1	1020423	calibration control cover
		<u>Consumables</u>
1	12082	Dust Filter (3 ea. per pkg)
1	GP450-DHC	Primary Battery (6 ea. per pkg)
1	415	Polarizing Battery (4 ea. per pkg)
1	5233K53	Sniffer Hose, 10 ft
		<u>Accessories</u>
1	1020216-1T	Calibration Resistor Low Range





MODEL 2x200-LD PORTABLE TRITIUM IN AIR LEAK DETECTOR

The Overhoff Model **2x200-LD** Tritium Leak Detector has the unique ability to monitor for tritium compounds and elemental tritium in real time while providing gamma compensation. The two measurement channels, T2 and T2O/HTO, are selected with a front panel toggle switch and appear on a single digital display.

The required radiological protection for tritium compounds is much higher than that for elemental tritium. Elemental tritium will combine readily with oxygen to form tritium oxide and also will replace hydrogen atoms in compounds. Therefore the presence of elemental tritium in the working environment is an indication of a current leak in the system or container. Knowing this, the user of the Model 2x200-LD can rapidly locate the point of release and more efficiently secure the source of leakage.

SENSITIVITY

The sensitivity of the **2x200-LD** is better than $5 \mu\text{Ci}/\text{m}^3$ (0.5 DAC) for T2O. The sensitivity to T2 is better than 0.05% of the T2 DAC stated in 10CFR835.

RADON INTERFERENCE, NOISE RESPONSE

Unambiguous measurement of very low tritium levels requires a monitor that can ignore ambient radon. The Model 2x200-LD incorporates a radon suppression circuit and therefore produces accurate and drift-free readings.

GAMMA COMPENSATION

The instrument has active gamma compensation with 2x2 ionization chamber geometry.

FAST RESPONSE

Exceptionally rapid response is due to its unique ability to ignore radon. The instrument has an electronic time constant of only 10 seconds, a 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.

DESICCANT COLUMN

A desiccant column traps the tritium oxide in the sample. The indicating type desiccant changes color from blue to pink when it is exhausted. Regeneration will restore the drying capacity.



T2 and T2O Modes	two channel measurement, switch selectable
High Sensitivity	to $5 \mu\text{Ci}/\text{m}^3$ (0.5 DAC)
Fast Response	15 second time constant
Gamma Compensated	no offset in 5 mR/h field
Response To Radon	suppression circuit ensures noise free operation
No Zero Drift	better than $1 \mu\text{Ci}/\text{m}^3$
Rapid Warm Up	less than 30 seconds

The Model **2x200-LD** can be configured as a “sniffer” to provide real-time indication of the T2 and T2O concentrations which allow the user to quickly identify the source of leakage of tritium from containers.

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MODEL 2x200-LD PORTABLE TRITIUM IN AIR LEAK DETECTOR

MEASUREMENT RANGE	1 – 19,999 $\mu\text{Ci}/\text{m}^3$, basic sensitivity of the order of 5 $\mu\text{Ci}/\text{m}^3$
DISPLAY	0 – 19,999 digits, LCD panel meter
T2 AND T20 MODES	Two channel measurement, switch selectable
ACCURACY, SPAN	$\pm 10\%$ of reading, $\pm 2 \mu\text{Ci}/\text{m}^3$, whichever is greater
NOISE LEVEL	$\pm 2 \mu\text{Ci}/\text{m}^3$ (10 second electronic time constant)
ZERO STABILITY	$\pm 2 \mu\text{Ci}/\text{m}^3$ long term
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"> 1. Ten position stepped attenuator set point for signal alarm 2 - 1,000 $\mu\text{Ci}/\text{m}^3$, steady tone. An OFF position is included. 2. Low flow produces an intermittent tone 3. Mute switch silences audible tone
ALARM (VISUAL)	signal level: red LED low flow: yellow LED, flashing low battery: red LED
EXTERNAL CONNECTIONS	mini DIN plug for output signal, and for alarms
IONIZATION CHAMBER VOLUME	effective volume: 200 cm^3 port to port volume: 660 cm^3
DUST FILTER	HEPA, in-line disposable cartridge, Pall P/N 12082
PUMP	internal rotary vane pump
FLOW RATE	nominally 1.5 - 2 LPM
ENVIRONMENTAL	0° C to +50° C, 0 - 95 % relative humidity
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)
DESICCANT COLUMN	Clear polycarbonate cartridge of indicating desiccant



T20 - T2 SWITCH



DESICCANT CARTRIDGE

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MODEL 2x200-LD PORTABLE TRITIUM IN AIR LEAK DETECTOR

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
2	22BH-4-2	Hose Barb, Sample-In
1	230-4-2	Hose Barb, Sample-Out
1	12082	In-Line Dust Filter (Pack of 3)
1	CLIC-51	Holder for Dust Filter No. 12082
1	DMO-742W	LCD Panel Meter
2	20-3320	Control Knob including Cap and Skirt
1	KU402B1/8	Zero 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	D-Size NiMH Batteries, Primary Power
4	415	Batteries, 45V Polarizing
2	26930	Indicating Desiccant Column
1	23005	5 lb Jar of Indicating Desiccant

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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

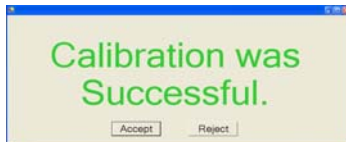
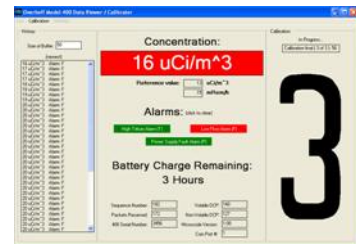
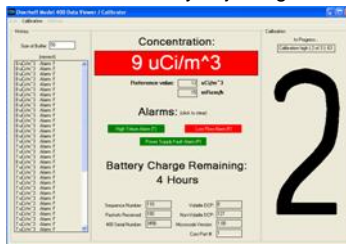
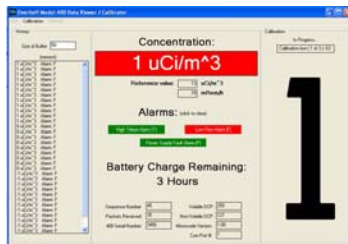
The Overhoff Technology Model **400AC** portable tritium monitor is an instrument with unequalled performance in sensitivity, stability, speed of response and gamma compensation.

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MODEL 400AC PORTABLE TRITIUM IN AIR MONITOR

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"> 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 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 cm^3 port to port volume: 440 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