



Model **357BWC** Cart-Mounted Tritium in Air Monitor For Nuclear Power Plants

The **Model 357BWC** is a semi-portable tritium in air monitor mounted on a stainless steel cart suitable for moving to multiple sampling points and continuous operation. The Model 357BWC can be used for monitoring rooms, glove boxes, fume hoods, exhaust stacks and systems, as well as process piping. The display/control unit is mounted inside a NEMA-12 enclosure, which includes a hinged door with lock, and is also double-hinged to allow servicing of the components. The Model 357BWC is designed for nuclear power plant environments and is a highly accurate and stable tritium air monitor that can easily be moved to multiple locations on a rugged cart.

Model 357BWC Features:

- Mounted on stainless steel cart with low-friction casters for portability
- Dual 2L or quad 2L ionization chambers for superior gamma compensation
- Wire-grid ion chambers eliminate tritium and gamma plate-out contamination
- $\pm 5\%$ accuracy across the entire range
- Alpha pulse suppression (radon compensation)
- Dual desiccant dryer cartridges for noble gas compensation or HTO only measurement
- Heavy-duty diaphragm pump with maximum head pressure 103kPa (1 atm) and bypass
- Inlet temperature gauge
- Moisture separator and trap
- Stainless steel sample connections and tubing
- Upgraded alarm system: high level alarm (latching or non-latching), malfunction alarm (power supply or electrometer failure), and low flow alarm.

The Model 357BWC is available with either dual 2L ion chambers or quad 2L ion chambers, depending on your desired sensitivity and gamma compensation requirements. Quad 2L chambers arranged in a cruciform geometry will provide better sensitivity and omnidirectional stability with virtually no offset even in gamma fields up to 30 mR/h.

The 357BWC includes a desiccant dryer system with two desiccant columns, such that while one is in use, the other can be regenerated. We can also provide a cascaded array of four desiccant columns to extend the time between servicing the desiccant.

The 357BWC can be configured to measure tritium oxide (HTO) only, even in the presence of other radioactive gases such as noble gases, or total tritium (HT + HTO) by addition of an oxidizer.



Applications:

- ♦ Room air
- ♦ Stacks, hoods, or other effluents
- ♦ Process piping
- ♦ Glove boxes, and similar

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TECHNICAL SPECIFICATIONS

RANGE	<u>Typical Measurement Ranges:</u> a) 1 to 19,999 $\mu\text{Ci}/\text{m}^3$, MDA is 1 $\mu\text{Ci}/\text{m}^3$ b) 0.01 to 199.99 MBq/m^3 , MDA is 0.03 MBq/m^3 c) 0.1 to 1,999.9 MBq/m^3 or DAC where 1 DAC=10 $\mu\text{Ci}/\text{m}^3$ d) 1 to 19,999 $\mu\text{Sv}/\text{h}$, MDA is 1 $\mu\text{Sv}/\text{h}$ Extra-sensitive option with quad 2L chambers: e) 0.1 to 1,999.9 $\mu\text{Ci}/\text{m}^3$, MDA is 0.5 $\mu\text{Ci}/\text{m}^3$
DISPLAY	Digital Meter, 4 1/2" digit LED
ACCURACY	$\pm 5\%$ of reading, $\pm 1 \mu\text{Ci}/\text{m}^3$, whichever is greater
REPRODUCIBILITY	$\pm 5\%$ across the entire measurement range
STABILITY AND DRIFT, LONG TERM	$\pm 1 \mu\text{Ci}/\text{m}^3$, over the entire temperature range
NOISE	$\pm 1 \mu\text{Ci}/\text{m}^3$, 2 sigma, with 20 second time constant
GAMMA COMPENSATION	second ion chamber of equal volume, mounted coaxially for dual chambers, or in a cruciform arrangement for quad, serves to cancel effects of external gamma fields
RESPONSE RATE	two linear time constants 20 seconds for measurements below 80 $\mu\text{Ci}/\text{m}^3$ 3 seconds for measurements above 80 $\mu\text{Ci}/\text{m}^3$
ALARM SYSTEM	-single level alarm, with adjustable set point -mode switch: latching or non-latching operation with a momentary reset position -low flow alarm: differential pressure switch, activates audible and visual alarm -system failure alarm: high or low voltage out of tolerance and electrometer failure -acknowledge push button, silences the audible indicator for all above alarms
INDICATORS	acoustic signaler, red LED
IONIZATION CHAMBER VOLUME	dual 2L (measuring: 1,800 cm^3 , total wetted: 4,000 cm^3), or quad 2L (measuring: 3,600 cm^3 , total wetted: 8,000 cm^3)
PORTS AND TUBING	1/4" stainless steel Gyrolok with 316L stainless steel tubing
FLOWMETER	0-10 LPM adjustable rotameter
DUST FILTER AND PUMP	high efficiency 99.99% at 0.1 microns HEPA respirator type cartridge heavy-duty diaphragm pump, max pressure 103 kPa (1 atm), includes bypass mode
ENVIRONMENTAL	storage: -40° C to +60° C, operating: 0° C to +50° C, 0 to 95 % R.H. non-condensing
POWER	115 VAC or 240VAC, 50/60 Hz
CART MOUNTED	the system is mounted on a heavy-duty stainless steel cart with low friction casters
DIMENSIONS	cart size: 24" [610mm] Wide x 41.02" [1042mm] Long x 36" [914mm] High 53" [1346mm] overall height including electronics cabinet
WEIGHT	288 lbs. [131 kg]
INLET/OUTLET HOSES	sample inlet and outlet hoses are braided stainless steel construction with quick connect couplers at each end, 42" length (1.07 meters)

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