

Switching Chamber Tritium-in-Air-Monitor

Model: 7009

Application

Tyne's tritium in air monitor is used to determine the total tritium in air based on a continuous air sample drawn through a flexible tube that can be located up to 100 feet away. The tritium is measured using very accurate ion chambers. Also see Tyne's Model 7043 Portable Tritium in Air Monitor

Features

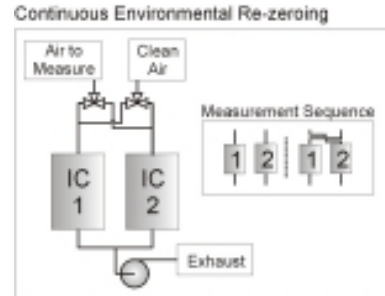
- Measures total tritium (T2 + HTO) in air
- Visual and audible alarms
- Long life air pump.
- Easy access dust filter
- Compensates for Gamma, environmental effects, and plate out.
- Two ion chambers alternatively used with auto switching for continuous re-zeroing



Description

Tyne's Tritium-in-Air Monitor comprises two parts: the Tritium Collection enclosure and the tritium measurement enclosure, also called the controller. The collection enclosure is responsible for all the handling

of the gas streams and the measurement enclosure handles all of the electronic measurement, display and alarm functions.

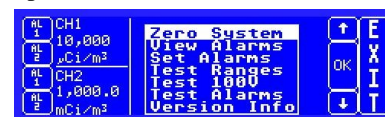


Dual ion chamber switching

The collection enclosure contains two 1 L ion chambers that are the basis for the measurement of the room air and the auto-zeroing function. The air pump draws the room air through one ion chamber and clean air through the second ion chamber to gain a measurement of the room air activity in the first chamber and the background reading of the second chamber. The system then switches the flows so that the first chamber will measure background and the second chamber will measure the activity. With the automatic switching system any effects from drift, temperature, humidity, and gamma radiation will be automatically compensated. This auto-zeroing procedure produces a very robust measurement that is insensitive to drift from environmental effects.

The air pump is a robust long life pump that can draw sample air from up to 100 feet away. The flow is regulated by a manual rotameter and is directed through an easy access paper dust filter to maintain the cleanliness of the system.

The measurement enclosure handles all of the electronic signals and the automatic switching. It is operated by a large, touch screen panel on the front, with an easy to read display and a full set of menu options.



touchscreen control panel

The controller handles all of the ion chamber switching and the auto-zeroing functions between the

chambers and displays a single compensated value in either $\mu\text{Ci}/\text{m}^3$ or Bq/m^3 , selected by the Purchaser when the instrument is ordered. The measurement range is between $1 \mu\text{Ci}/\text{m}^3$ and $1,000,000 \mu\text{Ci}/\text{m}^3$ with two settable alarms within that range. The two alarms have both a local audible and visual effect as well as a 30VAC/DC, 1A relay for remote alarm functions or process control.

The measured signal is also output in analog form as either 0-10V or 4-20mA. The controller may also be connected to a computer through the digital RS232 for remote display.



back view of controller

The Tritium-in-Air-Monitor benefits from Tyne's well proven, 15 years of operating experience in ion chamber technology and the very newest surface mount micro-controller and touch panel electronic controls. This match ensures only the best in reliability and ease of use via the user interface.

Note 1: If the tritium monitor is to be placed long distances from the sampled air source (beyond 30 feet), the Purchaser must specify the distance so that a pump with adequate suction can be installed. This method assumes that the room in which the tritium monitor is placed is free from tritium.

Note 2: If the Purchaser wishes to use the unit without tubing, ie to directly measure the condition of the room air in which the unit is placed, either clean instrument air must be provided for purging, or the ion chamber switching function must be disabled by Tyne, because purging cannot take place with the measured air, since it may contain tritium. In cases of low tritium levels, disabling the switching function has little impact on the reading accuracy.

Max sensitivity	$1 \mu\text{Ci}/\text{m}^3$
Controller display	108mm x 58mm touch screen
Accuracy	10% of monitoring range
Power	120V 50/60 Hz
Output Signal	4-20 mA or 0-10V selectable
Response time using Tyne controller, preamp, ion chamber	20 secs for measurements to $80 \mu\text{Ci}/\text{m}^3$; 3 seconds for measurements between $80 \mu\text{Ci}/\text{m}^3$ and $1 \text{mCi}/\text{m}^3$.
Ion Chambers	2 x 1000cc enclosed volume type
Ambient Temperature	0°C to 50°C
Relative Humidity	0 to 95%
Temperature Offset using Tyne controller, preamp, ion chamber	Less than $1 \mu\text{Ci}/^\circ\text{C}$ (can be computer compensated)
Max Flow rate	2,000 cc/s
Tritium recovery	Bakeable to 250°C , washable with demineralized water
Dimensions of Controller	381 mm x 483 mm x 140 mm (19" Rack Mount)
Dimensions of Area Tritium Monitor	381 mm x 483 mm x 140 mm (19" Rack Mount)
Electrical Safety	EMI Shielded
QA	ISO 9001:2000

Specifications

Range using Tyne controller, preamp, 1000cc ion chamber	0 through $1000 \text{Ci}/\text{m}^3$
---	---------------------------------------