

1000 cc Ion Chamber

Model: 7002

Application

The 1000 cc Ionization Chamber is designed as a robust, fast flow, bakeable radiation detector. With the small footprint and VCR8 connections the chamber is easily incorporated into any process. The specialized ceramic feed through allows a bias of up to 100V and an anode signal as low as 1 fA (corresponds to 1 $\mu\text{Ci}/\text{m}^3$ of tritium). When combined with Tyne's preamplifier and controller package or signal processor this makes an ideal tool for measuring tritium gas in any process.

Note: For higher tritium concentrations, please see Tyne's 10cc ion chamber.

Features

- 1000cc ion chamber suitable for $\mu\text{Ci}/\text{m}^3$ to Ci/m^3 of Tritium
- Bakeable to cleanse contaminated surfaces from ionization chamber
- Full vacuum to 150 psig
- Precise, tested and proven 1000cc geometry.
- Can bias anode up to 100V from ground
- Inlet precipitator
- Can be used in explosive environment with purge equipment
- Use in a process line or for room air measurements
- Flows up to 1 l/s



Description

The 1000 cc Ion Chamber is designed to be an in-line radiation in a process gas detector with the most typical application being Tritium. The inlet and outlet VCR 8 connectors allow the chamber to be easily mounted into an existing process line. The internal anode is connected to a floating BNC which can be biased up to 100 V. The high resistance ceramic of the feed through allows the ionization chamber to measure ionization currents as low as 1 fA (1 $\mu\text{Ci}/\text{m}^3$ of Tritium). The bias voltage is also connected to an inlet precipitator to remove any ionized particles carried into the chamber. The maximum inlet flow rate of 1 L/s ensures that all particles are neutralized before entering the chamber. The ionization chamber is an approved pressure vessel that can handle up to 150 psig, is bakeable up to 350°C and is 1×10^{-9} Helium leak tight. The electro-polished interior ensures low tritium hang up but in the case of contamination the chamber is easily cleaned with a moist air purge.

The ionization chamber is typically connected to the Tyne Engineering preamplifier or signal processor. The preamplifier is a multi-ranged amplifier that connects to a remote controller which gives the user the maximum flexibility for measuring the amount of tritium, auto zeroing and alarm functions. The signal processor is a low cost device that provides the bias and converts the 1 fA signal to an easily handled 0 – 10 V signal that can be integrated into any existing data acquisition system.

Specifications

Minimum Measurable Current	1 fA (equivalent to 1 $\mu\text{Ci}/\text{m}^3$ of Tritium)
Pressure	Vacuum to 150 psig
Temperature	350 °C
Volume	1000 cc
Measurement Type	Measure ions with a biased Anode
Detection volume Type	Solid Wall – maximum sensitivity
Maximum Bias	100 VDC
External Gamma source Signal	500 fA per 1 mR/h
Carry over Protection	Inlet Precipitator
Flow rate	1000 cc/s recommended, 2000 cc/sec max
Leak Tightness	1×10^{-8} cc/sec
Relative Humidity	95 %
Interior	Electro polished
Wetted Parts	316L Stainless Steel, High Density Ceramic
QA	ISO 9001:2000