

# 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 system. 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 model 7047 10cc ion chamber.

## Features

- 1000cc ion chamber suitable for  $\mu\text{Ci}/\text{m}^3$  to  $\text{Ci}/\text{m}^3$  of Tritium
- Bakeable to cleanse contaminated surfaces of the 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 additional purge
- 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 process gas radiation 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 VDC. 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 registered up to 150 psig. It is bakeable up to 350°C and is  $1 \times 10^{-9}$  cc/sec Helium leak tight. The electro-polished interior ensures low tritium hang up, but in the case of contamination the chamber is easily cleaned by heating with a dry 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. This gives the user the maximum flexibility for measuring the amount of tritium, auto zeroing and alarm functions. The signal processor is a precision 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	Full 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 x 10E-8 cc/sec
Relative Humidity	95 % Non-condensing
Interior	Electro polished
Wetted Parts	316L Stainless Steel, High Density Ceramic
QA	ISO 9001:2000

Agent Stamp / Business Card

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